City of Denton

Meeting Agenda

Public Utilities Board

City Hall
215 E. McKinney St.
Denton, Texas 76201
www.cityofdenton.com

Monday, December 15, 2025 | **9:00 AM** | **Council Work Session Room**

REGISTRATION GUIDELINES FOR ADDRESSING THE PUBLIC UTILITIES BOARD

Citizens will be able to participate in the following way:

• eComment – The agenda was posted online at https://tx-denton.civicplus.com/242/Public-Meetings-Agendas. Once the agenda is posted, a link to make virtual comments using the eComment module will be made available next to the meeting listing on the Upcoming Events Calendar. Using eComment, Individuals may indicate support or opposition and submit a brief comment about a specific agenda item. eComments may be submitted up until the start of the meeting at which time the ability to make an eComment will be closed. eComments will be sent directly to members of the Public Utilities Board immediately upon submission and recorded by the Secretary into the Minutes of the Meeting.

After determining that a quorum is present, the Public Utilities Board of the City of Denton, Texas will convene in a Regular Meeting on Monday, December 15, 2025, at 9:00 a.m. in the Council Work Session Room at City Hall, 215 E. McKinney Street, Denton, Texas at which the following items will be considered:

REGULAR MEETING

1. PRESENTATIONS FROM MEMBERS OF THE PUBLIC

This section of the agenda permits a person to make comments regarding public business on items as listed on the agenda. Each speaker will be allowed a maximum of four (4) minutes. Such person(s) shall have registered under the REGISTRATION GUIDELINES FOR ADDRESSING THE PUBLIC UTILITIES BOARD detailed at the beginning of this agenda. Registration is required prior to the time this agenda item is read into the record.

2. CONSENT AGENDA

Each of the items on the Consent Agenda is recommended by the Staff and approval thereof will be strictly on the basis of the Staff recommendations. Approval of the Consent Agenda authorizes the City Manager or designee to implement each item in accordance with the Staff recommendations. The Public Utilities Board has received background information and has had an opportunity to raise questions regarding these items prior to consideration.

Listed below are bids, purchase orders, contracts, and other items to be approved for payment or other action under the Consent Agenda (Agenda Items A – I). This listing is provided on the Consent Agenda to allow Public Utilities Board Members to discuss or withdraw an item prior to approval of the Consent Agenda. If no items are pulled, the Consent Agenda Items will be approved with one motion. If items are pulled for separate discussion, they may be considered as the first items following approval of the Consent Agenda.

A. PUB25-220 Consider recommending adoption of an ordinance of the City of Denton amending

Chapter 26 of the Code of Ordinances to update Sections 26-5, 26-8(d) and 26-9(d) amending deposit refund and payment agreement provisions; and providing a severability clause; providing a savings clause; providing for codification; and an effective date.

Attachments: Exhibit 1 - Agenda Information Sheet
Exhibit 2 - Ordinance
Exhibit 3 - Redline Code of Ordinances Changes
Exhibit 4 - Pay Agreement Guidelines.pdf

B. PUB25-221 Consider recommending adoption of an ordinance of the City of Denton, Texas; repealing sec. 26-128 "Adjustments in Bills for Losses from Water Leaks" of the code of the City of Denton, Texas; codifying a new Sec. 26-128 to add and clarify water and sewer billing leak adjustment program requirements and administrative procedures; providing for a repealer; providing a severability clause; and declaring an effective date.

Attachments: Exhibit 1 - Agenda Information Sheet
Exhibit 2 – Ordinance
Exhibit 3 - Redline Ordinance Changes

C. PUB25-226 Consider recommending adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute a Professional Services Agreement with Lockwood, Andrews & Newnam, Inc., for engineering services for the Lift Station Rehabilitation Project for the Water Utilities Department as set forth in the contract; providing for the expenditure of funds therefor; and providing an effective date (RFQ 8213-011 - Professional Services Agreement for engineering services awarded to Lockwood, Andrews & Newnam, Inc., in the not-to-exceed amount of $735,520.00).

Attachments: Exhibit 1 - Agenda Information Sheet
Exhibit 2 - Ordinance and Contract

D. PUB25-227 Consider recommending adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute a Professional Services Agreement with WM. M. Coleman & Associates, Inc. dba Coleman & Assoc. Land Surveying, for construction inspection services of the construction of Landfill Cell 6 for the Solid Waste and Recycling Department as set forth in the contract; providing for the expenditure of funds therefor; and providing an effective date (RFQ 8525-012 - Professional Services Agreement for construction inspection services awarded to WM. M. Coleman & Associates, Inc. dba Coleman & Assoc. Land Surveying, in the not-to-exceed amount of $156,265.00).

Attachments: Exhibit 1 - Agenda Information Sheet
Exhibit 2 - Ordinance and Contract

E. PUB25-229 Consider recommending adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute a contract with T.H. Glennon Co., Inc., for the purchase of mulch colorant for the Beneficial Reuse Department; providing for the expenditure of funds therefor; and providing an effective

date (RFP 8822 - awarded to T.H. Glennon Co., Inc., for three (3) years, with the option for two (2) additional one (1) year extensions, in the five (5) year not-to-exceed amount of $150,000.00).

Attachments: Exhibit 1 - Agenda Information Sheet
Exhibit 2 - Ordinance and Contract

F. PUB25-230 Consider recommending adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute a contract with Tanner Industries, Inc., for the purchase of anhydrous ammonia for the Water Production Department; providing for the expenditure of funds therefor; and providing an effective date (IFB 8823-1 - awarded to Tanner Industries, Inc., in a three (3) year, with the option for two (2) additional one (1) year extensions, in the total five (5) year not-to-exceed amount of $264,000.00).

Attachments: Exhibit 1 - Agenda Information Sheet
Exhibit 2 - Bid Tabulation
Exhibit 3 - Ordinance and Contract

G. PUB25-232 Consider recommending adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute a contract with Gage & Cade Construction, LLC, for the Home Chemicals and Recycling Center Improvements for the Solid Waste and Recycling Department; providing for the expenditure of funds therefor; and providing an effective date (CSP 8845 - awarded to Gage & Cade Construction, LLC, in the not-to-exceed amount of $614,738.00).

Attachments: Exhibit 1 - Agenda Information Sheet
Exhibit 2 - Pricing Evaluation
Exhibit 3 - Ordinance and Contract

H. PUB25-233 Consider recommending adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute a contract with Techline, Inc., through the Lower Colorado River Authority Contract No. 6941, for the acquisition of electric maintenance, repair, and construction inventory for Denton Municipal Electric to be stocked in the Warehouse and at Denton Municipal Electric; providing for the expenditure of funds therefor; and providing an effective date (File 8947 - awarded to Techline, Inc., in the five (5) year not-to-exceed amount of $6,000,000.00).

Attachments: Exhibit 1 - Agenda Information Sheet
Exhibit 2 - Cooperative Pricing
Exhibit 3 - Ordinance

I. PUB25-234 Consider recommending adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, ratifying the expenditure of funds by the City Manager, for the emergency purchase of switchgears for Denton Municipal Electric; and providing an effective date (File 8954 - awarded to Texas Electric Cooperatives, Inc., in the not-to-exceed amount of $260,200.00).

Attachments: Exhibit 1 - Agenda Information Sheet
Exhibit 2 - Quote
Exhibit 3 - Ordinance

3. ITEMS FOR INDIVIDUAL CONSIDERATION

A. PUB25-218 Consider approval of the October 27, 2025 minutes.

Attachments: 10.27.25 PUB Minutes

B. PUB25-224 Consider approval of the November 17, 2025 minutes.

Attachments: 11.17.25 PUB Minutes

C. PUB25-222 Consider recommending adoption of an ordinance of the City of Denton, Texas establishing the schedule of rates for electric service; amending the Transmission Cost Recovery Factor Schedules to add rate schedule TCRF LL for a Transmission Cost Recovery Factor rate schedule for large load customers whose planned or actual single point of delivery meets or exceeds 20 megawatts; providing for a repealer; providing for a severability clause; and providing effective dates for this ordinance and the schedule of rates.

Attachments: Exhibit 1: Agenda Information Sheet
Exhibit 2: Presentation

D. PUB25-228 Consider recommending adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute a contract with Integrated Power Co., for transmission line construction and maintenance for Capital Improvement Plan projects for Denton Municipal Electric; providing for the expenditure of funds therefor; and providing an effective date (CSP 8776 - awarded to Integrated Power Co., in the not-to-exceed amount of $67,990,000.00).

Attachments: Exhibit 1 - Agenda Information Sheet
Exhibit 2 - Pricing Evaluation
Exhibit 3 - Presentation
Exhibit 4 - Ordinance and Contract

E. PUB25-231 Consider recommending adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute a contract with Stuart C. Irby Company, LLC, for the purchase of high voltage circuit breakers for Denton Municipal Electric; providing for the expenditure of funds therefor; and providing an effective date (RFP 8836 - awarded to Stuart C. Irby Company, LLC, for one (1) year, with the option for four (4) additional one (1) year extensions, in the total five (5) year not-to-exceed amount of $22,257,824.00).

Attachments: Exhibit 1 - Agenda Information Sheet
Exhibit 2 - Pricing Evaluation
Exhibit 3 - Presentation
Exhibit 4 - Ordinance and Contract

F. PUB25-225 Management Reports

1. Purchasing Retroactive Memo
2. UECP Annual Refunding
3. PUB25-205 Retroactive Council Item
4. PUB CWSRF Management Report
5. Future Agenda Items
6. New Business Action Items

Attachments:
1. Purchasing Retroactive Memo
2. UECP Annual Refunding
3. PUB25-205 Retroactive Council Item
4. PUB CWSRF Management Report
5. Future Agenda Items
6. New Business Action Items

4. CONCLUDING ITEMS

A. Under Section 551.042 of the Texas Open Meetings Act, respond to inquiries from the Public Utilities Board or the public with specific factual information or recitation of policy, or accept a proposal to place the matter on the agenda for an upcoming meeting AND Under Section 551.0415 of the Texas Open Meetings Act, provide reports about items of community interest regarding which no action will be taken, to include: expressions of thanks, congratulations, or condolence; information regarding holiday schedules; an honorary or salutary recognition of a public official, public employee, or other citizen; a reminder about an upcoming event organized or sponsored by the governing body; information regarding a social, ceremonial, or community event organized or sponsored by an entity other than the governing body that was attended or is scheduled to be attended by a member of the governing body or an official or employee of the municipality; or an announcement involving an imminent threat to the public health and safety of people in the municipality that has arisen after the posting of the agenda.

Following the completion of the Regular Meeting, the Public Utilities Board will convene in a Work Session at which the following items will be considered:

WORK SESSION

A. PUB25-235 Receive a report, hold a discussion, and provide suggestions or recommendations regarding updates to the City of Denton Design Criteria Manual.

Attachments:
Exhibit 1 – Agenda Information Sheet
Exhibit 2 – Draft Denton Design Criteria Manual Update – Clean Copy
Exhibit 3 – Draft Denton Design Criteria Manual Update – Redline Copy
Exhibit 4 – Presentation

Following the completion of the Work Session, the Public Utilities Board (PUB) will convene in a Closed Meeting to consider specific items when these items are listed below under the Closed Meeting section of this agenda. The Public Utilities Board (PUB) reserves the right to adjourn into a Closed Meeting on any item on its Open Meeting agenda consistent with Chapter 551 of the Texas Government Code, as amended, or as otherwise allowed by law.

CLOSED MEETING

A. PUB25-223 Deliberations Regarding Certain Public Power Utilities: Competitive Matters - Under Texas Government Code Section 551.086.

Receive information from staff regarding the energy cost adjustment and transmission cost recovery factor schedule of rates for large load commercial customers that include public power utility competitive data; discuss, deliberate, and provide direction to staff regarding same.

Any final action, decision, or vote on a matter deliberated in a Closed Meeting will only be taken in an Open Meeting that is held in compliance with Texas Government Code, Chapter 551, except to the extent such final action, decision, or vote is taken in the Closed Meeting in accordance with the provisions of Section 551.086 of the Texas Government Code (The 'Public Power Exception'). The Public Utilities Board reserves the right to adjourn into a Closed Meeting or Executive Session as authorized by Texas Government Code, Section 551.001, et seq. (The Texas Open Meetings Act) on any item on its Open Meeting agenda or to reconvene in a continuation of the Closed Meeting on the Closed Meeting items noted above, in accordance with the Texas Open Meetings Act, including, without limitation Section 551.071-551.086 of the Texas Open Meetings Act.

CERTIFICATE

I certify that the above notice of meeting was posted on the official website (https://tx-denton.civicplus.com/242/Public-Meetings-Agendas) and bulletin board at City Hall, 215 E. McKinney Street, Denton, Texas, on December 8, 2025 in advance of the three (3) business day posting deadline, as applicable, and in accordance with Chapter 551 of the Texas Government Code.

_____

OFFICE OF THE CITY SECRETARY

NOTE: THE CITY OF DENTON'S DESIGNATED PUBLIC MEETING FACILITIES ARE ACCESSIBLE IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT. THE CITY WILL PROVIDE ACCOMMODATION, SUCH AS SIGN LANGUAGE INTERPRETERS FOR THE HEARING IMPAIRED, IF REQUESTED AT LEAST TWO (2) BUSINESS DAYS IN ADVANCE OF THE SCHEDULED MEETING. PLEASE CALL THE CITY SECRETARY'S OFFICE AT 940-349-8309 OR USE TELECOMMUNICATIONS DEVICES FOR THE DEAF (TDD) BY CALLING 1-800-RELAY-TX SO THAT REASONABLE ACCOMMODATION CAN BE ARRANGED.

City of Denton

City Hall
215 E. McKinney Street
Denton, Texas
www.cityofdenton.com

AGENDA INFORMATION SHEET

DEPARTMENT: Customer Service

DCM: Cassey Ogden

DATE: December 15, 2025

SUBJECT

Consider recommending adoption of an ordinance of the City of Denton amending Chapter 26 of the Code of Ordinances to update Sections 26-5, 26-8(d) and 26-9(d) amending deposit refund and payment agreement provisions; and providing a severability clause; providing a savings clause; providing for codification; and an effective date.

BACKGROUND

In July, 2009, City Council adopted strategic recommendations to base certain billing and collections processes on consumer credit risk. Updates to the deposit refund practices and the pay agreement program were recommended during a 2025 study of billing and collections processes and on September 30, 2025, City Council provided approval and direction for modifications.

Currently, residential deposits are held for one year of good payment history and commercial deposits are held for the lifetime of the account. Review also identified that current criteria for deposit refunds requires each account's history to be manually reviewed which prevents use of automated programming within the billing system. Proposed changes alleviate unnecessary manual work, continues the practice of refunding residential deposits after one year of good payment, and updates practices regarding commercial deposits to allow refund after two years of good payment history. This is in alignment with benchmarked utility best practices.

Payment agreements are currently very restrictive and lack any allowance for working with unique customer situations. Update of the code authorizes Customer Service to provide pay agreements with the use of internal guidelines approved by the City Manager with formalized changes to the written program guidelines being provided to City Council via ISR or Friday Report prior to implementation allowing Council to request review and discussion, if desired.

PRIOR ACTION/REVIEW (Council, Boards, Commissions)

City Council September 30, 2025
PUB August 25, 2025
EDPB September 10, 2025

EXHIBITS

Exhibit 1 – Agenda Information Sheet
Exhibit 2 – Ordinance
Exhibit 3 – Redline Code of Ordinances Changes
Exhibit 4 – Pay Agreement Guidelines

Respectfully submitted:
Antonio Puente, Jr., (940) 349-8487
DME General Manager

For information concerning this acquisition, contact: Christa Foster, 940-349-7412.

ORDINANCE NO. _____

AN ORDINANCE OF THE CITY OF DENTON AMENDING CHAPTER 26 OF THE CODE OF ORDINANCES TO UPDATE SECTIONS 26-5, 26-8(d), AND 26-9(d) AMENDING DEPOSIT REFUND AND PAYMENT AGREEMENT PROVISIONS; AND PROVIDING A SEVERABILITY CLAUSE; PROVIDING A SAVINGS CLAUSE; PROVIDING FOR CODIFICATION; AND AN EFFECTIVE DATE.

WHEREAS, in the summer of 2008 the Utilities Customer Service department participated in a management study conducted by Navigant Consulting ("Navigant"). The results of that study provided an evaluation of the Department's current processes including procedures related to customer credit issuance and revenue collection. Navigant's findings indicated that the City's annual bad debt is high, especially for a small utility. These findings were due to a lack of effective customer credit screening, inadequate deposit policies, and ineffective collection efforts. Navigant recommended that Utilities Customer Service revamp procedures in order to reduce the City's bad debt load, as well as to enhance the utility customer experience; and

WHEREAS, in order to implement the Navigant recommendations, Utilities Customer Service once again partnered with Navigant in July, 2009. The goal of this collaborative effort was to introduce a strategy that bases collection activity on consumer credit risk. By going into a risk-based system, Utilities Customer Service can make processes easier for good paying customers and protect the City from bad debt that is associated with high risk customers. The processes that are a part of this ordinance can be used to guide decision making when working with new, existing, as well as former customers; and

WHEREAS, in order to continue service and practice evaluation and improvement, Utilities Customer Service once again partnered with Navigant, now the Ascent Group, in November, 2025. The goal of this collaborative effort was to review ongoing performance and evaluate billing and collection practices for continued consistency with industry best practices. The processes that are a part of this ordinance reflect study findings to enable better service to utility customers; and

WHEREAS, Chapter 26 of the Denton Code of Ordinances presently addresses the subjects of utility service deposits and the collection of accounts regarding all City utility customers; this ordinance clearly provides amended and updated procedures for City utility customers that reflect changes in industry practice over time. This ordinance implements enhancements to deposit refund and payment arrangement standards within Denton Municipal Utilities; and

WHEREAS, the City Council now desires to amend the adjustment guidelines to provide improved procedures governing program restrictions; NOW THEREFORE,

THE COUNCIL OF THE CITY OF DENTON HEREBY ORDAINS:

SECTION 1. The following sections of the City of Denton Code of Ordinances, Chapter 26, "Utilities" are hereby amended to read as follows:

Refer to Exhibit "A" incorporated herewith and attached hereto, which sets forth the

provisions of Section 26-5 in its entirety, Section 26-8(d) and Section 26-9(d) as said Sections are now amended by this ordinance.

SECTION 2. This ordinance shall become effective immediately upon its passage and approval.

SECTION 3. To the extend not otherwise provided, this ordinance shall repeal every prior ordinance in conflict herewith, but only insofar as the portion of such ordinance shall be in conflict; and as to all other sections of the ordinance not in direct conflict herewith, this ordinance shall be and is hereby made cumulative except as to such prior ordinances or portions thereof as are expressly repealed hereby.

SECTION 4. If any provision of this ordinance or the application thereof to any person or circumstance is held invalid by any court, such invalidity shall not affect the validity of any other provisions or applications, and to this end the provisions of this ordinance are severable.

SECTION 5. The City Secretary is hereby directed to record and publish the above regulations in the City's Code of Ordinances.

The motion to approve this ordinance was made by _____ and seconded by _____. This Ordinance was passed and approved by the following vote [___ - ___]:

	Aye	**Nay**	**Abstain**	**Absent**
Mayor Gerard Hudspeth:	_____	_____	_____	_____
Vicki Byrd, District 1:	_____	_____	_____	_____
Brian Beck, District 2:	_____	_____	_____	_____
Suzi Rumohr, District 3:	_____	_____	_____	_____
Joe Holland, District 4:	_____	_____	_____	_____
Brandon Chase McGee, At Large Place 5:	_____	_____	_____	_____
Jill Jester, At Large Place 6:	_____	_____	_____	_____

PASSED AND APPROVED this the _____ day of _____, 2026.

_____
GERARD HUDSPETH, MAYOR

ATTEST:
INGRID REX, CITY SECRETARY

BY: _____

APPROVED AS TO LEGAL FORM:
MACK REINWAND, CITY ATTORNEY

BY: Devin Q. Alexander

Exhibit A

ARTICLE I. IN GENERAL

Sec. 26-5. Refunds of deposits.

The city shall refund deposits to applicants and customers if one of the following events occurs:

(1) The customer's service has been disconnected

a. The city shall refund the deposit plus accrued interest less any outstanding balances. Any credit will be transferred to another active account belonging to the customer. However, in absence of another active account, refund may be issued in the form of a check after the due date of the final bill has passed. A transfer of service from one service location to another shall not be deemed a disconnection and the city shall not require an additional deposit unless authorized by section 26-3 or section 26-4 hereof.

(2) Once a customer's Deposit has been paid in full and on file for twelve (12) consecutive residential billings or twenty-four (24) consecutive commercial billings then the city may refund the deposit (plus accrued interest) to the customer in the form of a credit to the customer's account when the following criteria have been met:

a. customer has maintained or attained an A credit rating at the location;

b. customer is without having service disconnected for nonpayment of bills, or meter tampering; and

c. customer is not delinquent in the payment of the current bill.

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(Ord. No. 94-132, § I, 7-19-94; Ord. No. 2001-200, § 1, 5-15-01; Ord. No. 2002-316, § 1, 9-17-02; Ord. No. 2010-292, § 2(Exh. A), 11-16-10)

Sec. 26-8. Grounds for discontinuance of service; timing of disconnection of service.

Sec. 26-8(d)

(d) Utility services may be terminated if payments become delinquent. The city may terminate services at any time upon delinquent status of an account. Once services are terminated, any deposit held by the city will be applied to the delinquent account when the final bill is generated. If the customer wishes to reconnect services, the customer will be required to pay a delinquent service charge or a reconnect charge in addition to all unpaid over-due account balances or they may request a payment arrangement from the customer service department in accordance with section 26-9. The city may refuse service and require payment in full, based on the credit history of the customer. For continued service, the city will require an additional deposit amount as described in section 26-4.

Sec. 26-9. Billing and collection for services.

Sec 26-9(d)

(d) *Alternatives to termination of service.* A customer with a past due or delinquent balance may avoid termination of utility service by doing one (1) of the following:

(1) Paying the total amount due by the specified due date;

(2) Requesting a payment arrangement with the utility customer service department. The payment arrangement guidelines will be established by the City Manager and on file in the office of the city secretary. The City Manager may delegate authority of program administration and operational discretion to the head of Customer Service. City Council must receive notice of verbiage changes to posted program guidelines prior to implementation.

Sec. 26-5. Refunds of deposits.

The city shall refund deposits to applicants and customers if one of the following events occurs:

(1) The customer's service has been disconnected.

a. The city shall refund the deposit plus accrued interest less any outstanding balances. Any credit will be transferred to another active account belonging to the customer. However, in absence of another active account, refund may be issued in the form of a check after the due date of the final bill has passed. A transfer of service from one service location to another shall not be deemed a disconnection and the city shall not require an additional deposit unless authorized by section 26-3 or section 26-4 hereof.

(2) When the customer has paid bills and avoided delinquent status for service for twelve (12) consecutive residential billings or twenty-four (24) consecutive commercial billings then the city may ~~without having service disconnected for nonpayment of bills, or meter tampering, and provided the customer is not delinquent in the payment of the current bill. The city shall then, in that event,~~ refund the deposit (plus accrued interest) to the customer in the form of a credit to the customer's account when the following criteria have been met:~~.~~

a. customer has maintained or attained an A credit rating at the location;

b. customer is without having service disconnected for nonpayment of bills, or meter tampering; and

c. customer is not delinquent in the payment of the current bill.

(Ord. No. 94-132, § I, 7-19-94; Ord. No. 2001-200, § 1, 5-15-01; Ord. No. 2002-316, § 1, 9-17-02; Ord. No. 2010-292, § 2(Exh. A), 11-16-10)

Sec. 26-8. Grounds for discontinuance of service; timing of disconnection of service.

Sec. 26-8(d)

(d) Utility services may be terminated if payments become delinquent. The city may terminate services at any time upon delinquent status of an account. Once services are terminated, any deposit held by the city will be applied to the delinquent account when the final bill is generated. If the customer wishes to reconnect services, the customer will be required to pay a delinquent service charge or a reconnect charge and ~~the remaining balance of the delinquent amount or at least fifty (50) percent with an agreement to pay the remainder with three (3) consecutive equal monthly installments~~all outstanding, over-due account balances or they may request a payment arrangement from the customer service department in accordance with section 26-9. The city may refuse service and require payment in full, based on the credit history of the customer. For continued service, the city will require an additional deposit amount as described in section 26-4.

Sec. 26-9. Billing and collection for services.

Sec. 26-9(d)

(d) *Alternatives to termination of service.* A customer with a past due or delinquent balance may avoid termination of utility service by doing one (1) of the following:

(1) Paying the total amount due by the specified due date;

(2) Requesting a payment arrangement with the utility customer service department. The payment arrangement guidelines will be established by the City Manager and on file in the office of the city secretary. The City Manager may delegate authority of program administration and operational discretion to the Department head of Customer Service. City Council must receive notice of verbiage changes to posted program guidelines prior to implementation~~The payment arrangement guidelines will be established by the city council and on file in the office of the city secretary~~.

City of Denton Pay Arrangement Program Guidelines

General Considerations:

City of Denton utility customers may request a pay arrangement to extend time to pay beyond the bill's printed due date in order to prevent termination of service for nonpayment.

The City of Denton Pay Arrangement Program is set forth in City Ordinance Sec. 26-9 (d) ("Billing and collection for services – Alternatives to termination of service"). For the purposes of the program, the following definitions apply.

Balance - any billed utility charges which have been presented on a monthly bill providing a due by date indicating when charges will become eligible for nonpayment penalties and/or service interruption.

Installment – portion of the balance which must be made to prevent default of a set pay arrangement.

Long-term arrangement - an arrangement to split a large balance for payment over more than one month. Long-term arrangement guidelines may apply to customers whose services have been disconnected or terminated for non-payment.

Short-term arrangement - an arrangement for a temporary extension to pay a balance in full. Short-term arrangements are restricted to accounts which have not reached the interruption date for balances due.

Pay Arrangement Guidelines & Qualifications:

Pay arrangements should meet the following criteria:

Short-term arrangement qualification(s):

(1) Arrangement due date is set for the due date of the current bill.

Long-term arrangement qualification(s):

(1) Down payment of at least fifty (50) percent of the outstanding balance may be required prior to arrangement issuance;

(2) Each installment shall be due on the printed bill due date showing the installment;

(3) Arrangement must be paid in consecutive months; and

(4) Standard arrangements may be no longer than three (3) months.

In addition to the arrangement specific qualifications, all arrangements should meet the following general qualifications:

(1) Accounts must be on post-paid utility service;

(2) Accounts may have one (1) active short-term or long-term arrangement at any given time;

(3) Established payment dates may not be altered later; and

(4) The customer must meet defined pay arrangement obligations to prevent default.

Pay Arrangement Terms, Obligations, and Eligibility:

City of Denton customers may utilize the pay arrangement program as frequently as needed to allow additional time to pay utility bills. Customers entering into an arrangement receive protection from late fees or penalties and service interruption for any balance included in an active arrangement that is in good standing.

Pay Arrangements are a binding agreement. Arrangements may not be altered once established. To prevent default, each arrangement installment(s) must be made in full by the determined date.

Failure to make installment payment in full results in default of the arrangement and balances become immediately due. The account becomes eligible for interruption the first business day after default. Interruption of service due to defaulted payment arrangement is subject to a service deposit as set forth in City Ordinance Sec. 26-8 (d) ("Grounds for discontinuance of service; timing of disconnection of service").

If a customer is in default of two (2) pay arrangements of any kind during a 12-month period, the customer becomes temporarily ineligible to enter pay arrangements for a one-year period. Pay arrangement ineligibility does not prevent the customer from utilizing other bill assistance options such as Pay As You Go prepaid utilities or the budget billing program so long as program guidelines are otherwise met.

Customer Payment Responsibility:

City of Denton Pay Arrangement Program is provided as a courtesy to customers and is not an entitlement. Customers are responsible for any billed charges including those covered by arrangements as set forth in Denton City Charter, Sec. 12.02 which prohibits the provision of free service. Default of a pay arrangement voids the arrangement and balances will be subject to the terms required by City Ordinance 26-8 and 26-9.

City of Denton

City Hall
215 E. McKinney Street
Denton, Texas
www.cityofdenton.com

AGENDA INFORMATION SHEET

DEPARTMENT: Customer Service

DCM: Cassey Ogden

DATE: December 15, 2025

SUBJECT

Consider recommending adoption of an ordinance of the City of Denton, Texas; repealing sec. 26-128 "Adjustments in Bills for Losses from Water Leaks" of the code of the City of Denton, Texas; codifying a new Sec. 26-128 to add and clarify water and sewer billing leak adjustment program requirements and administrative procedures; providing for a repealer; providing a severability clause; and declaring an effective date.

BACKGROUND

On March 22, 2022, City Council adopted enhancements to the water and sewer leak adjustment processes which placed most program provisions under the authority of the City Manager. Updates to the program were recommended during a 2025 study of billing and collections processes and on September 30, 2025, City Council provided approval and direction for modifications.

During the legal review process, it was recommended that discretionary authority be more clearly defined. Therefore, the code has been updated to reflect this guidance.

The basic program provisions are outlined below.

Component	Ordinance Provision
Submission Deadline	Repair Completion: 1 Month from Detection Submission: 60 Days from Repair Completion
Months Covered	2 Consecutive
Required Increase	Based on Usage History Available 150% of Usage Average for Same Month Last 2 Years, or 150% of Usage for Same Month Previous 2 Year, or 150% of Usage Average of Most Recent 6 Leak-Free Months*
Maximum Coverage	100,000 Gallons Excess Usage (Residential or Commercial)
Charges Adjusted	50% of Excess Usage
Leaks Covered	All Indoor/Outdoor Leaks (Including Irrigation/Pools)
Repair Proof	Itemized, Paid Repair Bills
Permitting/Inspection Obtained	As Required by Building Code with Provision for Renters
Frequency	1 per 12 Rolling Months

* Requests with less than 6 months leak-free usage will be held until usage is available

In addition to the basic program provisions, the City Manager or their designee is granted authority to work with customers, as appropriate, regarding repair and submission deadlines.

Additionally, a new provision has been added to allow one-time assistance of up to $2000 to residential customers experiencing exceptional water loss causing greater than 100,000 gallons of excess usage if the loss is 10 times the normal expected usage. There is a clause allowing customers who may have experienced this level of loss in the 24 months prior to ordinance approval to apply for coverage within the standard application timelines starting with the effective date of the ordinance.

The exceptional loss provision requires City investigation, City Manager review/approval and City Council must receive a report of its use. This reporting requirement replaces the general annual reporting requirement in previous code since other loss guidelines are clearly defined and to ensure accountability and timely notification of use of the provision.

PRIOR ACTION/REVIEW (Council, Boards, Commissions)
City Council September 30, 2025
PUB August 25, 2025
EDPB September 10, 2025

EXHIBITS
Exhibit 1 – Agenda Information Sheet
Exhibit 2 – Ordinance
Exhibit 3 – Redline Ordinance Changes

Respectfully submitted:
Antonio Puente, Jr., (940) 349-8487
DME General Manager

For information concerning this acquisition, contact: Christa Foster, 940-349-7412.

ORDINANCE NO. _____

AN ORDINANCE OF THE CITY OF DENTON, TEXAS; REPEALING SEC. 26-128 "ADJUSTMENTS IN BILLS FOR LOSSES FROM WATER LEAKS" OF THE CODE OF THE CITY OF DENTON, TEXAS; CODIFYING A NEW SEC. 26-128 TO ADD AND CLARIFY WATER AND SEWER BILLING LEAK ADJUSTMENT PROGRAM REQUIREMENTS AND ADMINISTRATIVE PROCEDURES; PROVIDING FOR A REPEALER; PROVIDING A SEVERABILITY CLAUSE; AND DECLARING AN EFFECTIVE DATE.

WHEREAS, on March 22, 2005, by Ordinance No. 2005-092, the City Council amended Sec. 26-128 of the Code of the City of Denton, Texas to clarify the procedures and to define qualifications for water and sewer billing adjustments due to hidden water loss (the "Leak Adjustment Program"); and

WHEREAS, on March 22, 2022, by Ordinance No. 22-319, the City Council adopted amendments to Sec. 26-128 of the Code of the City of Denton, Texas to provide broad program guidance, expectations, and accountability; to authorize administration details to be maintained through a documented City program; and to change the section title to more accurately reflect broader leak acceptance; and

WHEREAS the City Council now desires to further revise and refine the Leak Adjustment Program guidelines to provide improved procedures governing program eligibility, restrictions, and administration; and

WHEREAS, the City Council hereby finds and determines that the Leak Adjustment Program provided in the new Sec. 26-128 is necessary and in the public interest.

NOW THEREFORE, THE COUNCIL OF THE CITY OF DENTON HEREBY ORDAINS:

SECTION 1. The findings and recitations contained in the preamble of this ordinance are incorporated herein by reference and found to be true.

SECTION 2. Sec. 26-128 of the Code of the City of Denton, Texas, last amended by the City Council pursuant to Ordinance 22-319 on March 22, 2022, is hereby repealed in its entirety.

SECTION 3. The Code of the City of Denton, Texas is hereby amended to codify a revised Sec. 26-128 entitled "Adjustments in bills for losses from water leaks", attached hereto as Exhibit "A" and incorporated herein as if fully set forth herein.

SECTION 4. All provisions of the Code of the City of Denton, Texas codified or uncodified, in direct conflict with the provisions of this ordinance are hereby repealed, and all other provisions of the Code of the City of Denton, codified or uncodified, not in conflict with the provisions of this ordinance shall remain in full force and effect.

SECTION 5. To the extent not otherwise provided, this ordinance shall repeal every prior ordinance in conflict herewith, but only insofar as the portion of such ordinance shall be in conflict; and as to all other sections of the ordinance not in direct conflict herewith, this ordinance

shall be and is hereby made cumulative except as to such prior ordinances or portions thereof as are expressly repealed hereby.

SECTION 6. It is hereby declared to be the intention of the City Council that the sections, paragraphs, sentences, clauses, and phrases of this ordinance are severable, and if any phrase, clause, sentence, or section of this ordinance shall be declared unconstitutional or invalid by any court of competent jurisdiction, such unconstitutionality or invalidity shall not affect any other remaining phrase, clause, sentence, paragraph, or section of this ordinance.

SECTION 7. The City Secretary is hereby directed to record and publish the regulations attached hereto as Exhibit "A" in the City's Code of Ordinances.

SECTION 8. This ordinance shall become effective immediately upon its passage and approval.

The motion to approve this ordinance was made by _____ and seconded by _____. This Ordinance was passed and approved by the following vote [___ - ___]:

	Aye	**Nay**	**Abstain**	**Absent**
Mayor Gerard Hudspeth:	_____	_____	_____	_____
Vicki Byrd, District 1:	_____	_____	_____	_____
Brian Beck, District 2:	_____	_____	_____	_____
Suzi Rumohr, District 3:	_____	_____	_____	_____
Joe Holland, District 4:	_____	_____	_____	_____
Brandon Chase McGee, At Large Place 5:	_____	_____	_____	_____
Jill Jester, At Large Place 6:	_____	_____	_____	_____

PASSED AND APPROVED this the _____ day of _____, 2026.

_____
GERARD HUDSPETH, MAYOR

ATTEST:

INGRID REX, CITY SECRETARY

BY: _____

APPROVED AS TO LEGAL FORM:
MACK REINWAND, CITY ATTORNEY

BY: Devin Q. Alexander

EXHIBIT "A"

Sec. 26-128. Adjustments in bills for losses from water leaks.

(a) For the purposes of this policy, the following terms shall be defined as follows:

Adjustment means the application of a Leak Adjustment Rate to a Customer's Adjusted Usage, if their Billed Usage is the result of a Qualifying Leak.

Adjusted Usage means the difference between a Customer's Billed Usage and a Customer's Normal Expected Usage. Adjusted Usage may not exceed 100,000 gallons.

AMI Meter means a water meter discontinued, in-use, or approved by the City that has the ability to or is capable of collecting instantaneous, on-demand water use data and transmitting the data to the City's water utility.

Billed Usage means the amount of water metered and billed to a Customer's water account during the billing period(s) for which the Adjustment is requested.

City means the City of Denton, Texas.

Customer means any person who is listed on a utility account with the City. To be considered a Customer under this section, a person must provide documentation verifying their identity to the satisfaction of the City Manager or their designee.

Leak means a break or defect in a water line, system, fixture, or appliance that causes a loss of metered, potable water. A Leak may be the result of a break or defect within an irrigation or swimming pool system.

Leak Adjustment Rate means 50% of a Customer's Adjusted Usage.

Normal Expected Usage means the water usage expected at a service location based on the Customer's available account history, as determined by the City Manager or their designee using the tables below:

Non-AMI Meters	
Customer Account History Available	*Normal Expected Usage Calculation*
2+ Years	Customer's average water usage for the same month the previous two years
1-2 Years	Customer's water usage for the same month the previous year
6-11 Months	Customer's average usage for the most recent 6 leak-free months
Less Than 6 Months (Leak Free)	Request for a Leak Adjustment will be held until 6 months of usage data is available

AMI Meters
Usage shall be limited to similar periods of continuous water flow data which is verified through review of AMI interval usage data. In absence of comparable interval usage data, the calculation of Normal Expected Usage applicable to Non-AMI Meters applies.

Qualifying Leak means a Leak that meets all the requirements of this section and causes an increase in water usage that is 50% higher than a Customer's Normal Expected Usage. Leaks due to theft, vandalism, negligence, or any unidentified source are not a Qualifying Leak. Detectable Leaks or Leaks caused by

structural issues associated with a swimming pool or by the filling of a swimming pool are not a Qualifying Leak.

(b) This section shall be administered by the City Manager, or their designee, in accordance with this section.

(c) Customers who meet the requirements of this section may receive an Adjustment that reduces the amount owed to the City for water service due to a Qualifying Leak. Specifically, to receive an Adjustment under this section, a Customer must:

(1) Submit a complete application in accordance with this section using a form and submission method required by the City Manager or their designee;

(2) Meet all the requirements of this section;

(3) Not have received an Adjustment under this section within the preceding twelve (12) months;

(4) Except as provided in subsection (k), repair the Qualifying Leak within thirty (30) days of the date of detection. The date of detection may be assumed by the City Manager, or their designee, to be prior to the date an application is submitted or on a date established by Billed Usage;

(5) Submit evidence demonstrating to the satisfaction of the City Manager, or their designee, that the Qualifying Leak has been repaired in accordance with all applicable City ordinances, codes, rules, and regulations;

(6) Except as provided in subsection (j), obtain any permits required by any applicable City ordinances, codes, and regulations;

(7) Pass any inspections of the repair required by any applicable City ordinances, codes, and regulations; and

(8) Not have received a citation for a violation of any provision of Sections 26-233, 26-234, or 28-446 within the ninety (90) days prior to repair of the Qualifying Leak.

(d) Repairs under subsection (c)(4) requiring permitting and inspection may be made by the property owner or by a licensed professional.

(e) Except as provided in subsection (k), an application for an Adjustment must be submitted within sixty (60) days of repair of a Qualifying Leak. The Customer must submit all documentation requested by the City Manager or their designee. Requested documentation may include, without limitation, any or all of the following items:

(1) a repair invoice;

(2) a parts receipt;

(3) a letter from a licensed professional certifying the repair is completed; and

(4) any other information documenting the repair deemed sufficient by the City Manager or their designee.

The method required for submission of evidence of repair under this section will be determined by the City Manager or their designee. The application form shall contain a statement setting forth an understanding that the application is a government record subject to criminal prosecution for false statements under Chapter 37 of the Texas Penal Code, and the Customer must state that the application and attached evidence contains no false statements.

(f) Qualifying Leaks meeting all the requirements of this section shall receive an Adjustment for up to two consecutive billing periods at the Leak Adjustment Rate for up to 100,000 gallons. The City Manager, or their designee, shall calculate an Adjustment by:

(1) Determining the Customer's Billed Usage;

(2) Determining the Customer's Normal Expected Usage;

(3) Determining the Customer's Adjusted Usage by calculating the difference between their Billed Usage and their Normal Expected Usage; and

(4) Multiplying the Customer's Adjusted Usage by the Leak Adjustment Rate.

An example calculation for a Customer who qualifies for an Adjustment is as follows:

Adjusted Usage Calculation		**Adjustment Calculation**	
Billed Usage	$75.00	Adjusted Usage	$50.00
Normal Expected Usage	- $25.00	Leak Adjustment Rate	x .50
Adjustment	$50.00	Adjustment	$25.00

(g) Water usage not subject to this section will be billed according to the applicable rates established by the City Council and amended from time to time.

(h) All Adjustments will be issued as a credit to the Customer's account. Adjustments will not be applied to a Customer's account until one full, leak-free month of service has been billed. To avoid penalties, interest, or interruption during the Adjustment process, a Customer must follow standard payment processes including, without limitation, payment of billed charges or entering into a payment arrangement.

(i) Adjustments are provided as a courtesy to Customers and are not an entitlement. Customers are responsible for all usage and billed amounts not adjusted under this section. Denton City Charter, Sec. 12.02 prohibits the provision of free service.

(j) Customers who rent a service location and who do not have the legal authority to obtain permits required by the City may qualify for an Adjustment without obtaining the permits, if the following conditions are met:

(1) The Customer must provide written documentation evidencing to the satisfaction of the City Manager, or their designee, their efforts to inform the property owner of the Qualifying Leak;

(2) The Customer must provide written documentation evidencing to the satisfaction of the City Manager, or their designee, their efforts to inform the property owner that repair of the Qualifying Leak requires permit(s); and

(3) The Customer must comply with all other requirements of this section.

(k) An extension of the application deadline in subsection (e) of up to fourteen (14) days may be granted under the authority of the City Manager, or their designee. Requests for an extension of the repair deadline in subsection (c) or requests for an extension greater than fourteen days for the application deadline in subsection (e) may be granted under the authority of the City Manager, or their designee, if the Customer submits evidence establishing good cause for the extension. Examples of good cause include, but are not limited to:

(1) Force majeure due to natural causes with no human intervention contributing to its occurrence;

(2) Excessive residential repair costs; and

(3) Critical illness.

(l) Notwithstanding any conflicting provision of this section, any Billed Usage in excess of ten (10) times the Normal Expected Usage may be Adjusted by up to $2,000. To receive this credit, the following criteria must be met:

(1) The Leak associated with the Billed Usage must be a Qualifying Leak;

(2) The Qualifying Leak must not exceed two billing periods;

(3) The Customer must meet all other applicable requirements of this section;

(4) The Customer may not have received a previous Adjustment under this subsection (m) for the affected account;

(5) The City Manager, or their designee, must conduct an investigation and obtain evidence establishing that the increased usage was not the result of the Customer's failure to take reasonable action(s) to correct or address the Qualifying Leak. If the initial investigation reveals a billing or meter error, the Customer's account may be adjusted under the authorization of Section 26-23(3)(a);

(6) The City Manager must review and approve the Adjustment; and

(7) City Council must receive a timely report of uses of this subsection (l).

(m) If a Customer's Normal Expected Usage under this section would reduce their wastewater volume, as calculated under the City's then-applicable rate book, then a separate wastewater adjustment may occur as authorized by Section 26-23(3)(c).

(n) Notwithstanding any deadlines provided in this section, a Customer may receive an Adjustment under subsection (l) for a Qualifying Leak that occurred in the twenty-four (24) months prior to January 1, 2026.

(o) Submitting an application does not remove a Customer's responsibility to pay for water service. To avoid penalties, interest, and/or interruption during the Adjustment process, a Customer must follow standard payment processes including, without limitation, payment of billed charges or entering into a payment arrangement.

(p) This section does not create any rights to an appeal of the City's decision whether to apply an Adjustment and the initial determination by City Manager or their designee shall be considered final and non-appealable.

(Code 1966, § 25-36; Ord. No. 2001-200, § 1, 5-15-01; Ord. No. 2005-092, § 1, 3-22-05; Ord. No. 22-319, § 1, 3-22-22)

Sec. 26-128. Adjustments in bills for losses from water leaks.

(a) For the purposes of this policy, the following terms shall be defined as follows:

Adjustment means the application of a Leak Adjustment Rate to a Customer's Adjusted Usage, if their Billed Usage is the result of a Qualifying Leak.

Adjusted Usage means the difference between a Customer's Billed Usage and a Customer's Normal Expected Usage. Adjusted Usage may not exceed 100,000 gallons.

AMI Meter means a water meter discontinued, in-use, or approved by the City that has the ability to or is capable of collecting instantaneous, on-demand water use data and transmitting the data to the City's water utility.

Billed Usage means the amount of water metered and billed to a Customer's water account during the billing period(s) for which the Adjustment is requested.

City means the City of Denton, Texas.

Customer means any person who is listed on a utility account with the City. To be considered a Customer under this section, a person must provide documentation verifying their identity to the satisfaction of the City Manager or their designee~~means any party with charge authorization listed on a billed utility account~~.

~~*Customer service* means the department responsible for the creation and maintenance of billed customer accounts.~~

~~*Excess usage* means the difference between the greatest normal usage of water at a service location and the actual amount of water metered and billed in the billing month for which the adjustment is requested at the service location.~~

~~*Greatest normal usage* means the calculation of a customer's normal water as defined within the program.~~

Leak means a break or defect in a water line, system, fixture, or appliance that causes a loss of metered, potable water. A Leak may be the result of a break or defect within an irrigation or swimming pool system~~means any loss of billed water due to failure of a plumbed line or fixture. Water loss due to theft, vandalism, negligence or any unidentified source is not covered~~.

Leak Adjustment Rate means 50% of a Customer's Adjusted Usage.

Normal Expected Usage means the water usage expected at a service location based on the Customer's available account history, as determined by the City Manager or their designee using the tables below:

Non-AMI Meters	
Customer Account History Available	*Normal Expected Usage Calculation*
2+ Years	Customer's average water usage for the same month the previous two years
1-2 Years	Customer's water usage for the same month the previous year
6-11 Months	Customer's average usage for the most recent 6 leak-free months
Less Than 6 Months (Leak Free)	Request for a Leak Adjustment will be held until 6 months of usage data is available

AMI Meters

Usage shall be limited to similar periods of continuous water flow data which is verified through review of AMI interval usage data. In absence of comparable interval usage data, the calculation of Normal Expected Usage applicable to Non-AMI Meters applies.

Qualifying Leak means a Leak that meets all the requirements of this section and causes an increase in water usage that is 50% higher than a Customer's Normal Expected Usage. Leaks due to theft, vandalism, negligence, or any unidentified source are not a Qualifying Leak. Detectable Leaks or Leaks caused by structural issues associated with a swimming pool or by the filling of a swimming pool are not a Qualifying Leak~~*Program* means the water and sewer billing leak adjustment program for the city.~~

~~*Program administrator* means the customer service manager or designee responsible for the program.~~

~~*Service* means a billed customer water account~~.

(b) This section shall be administered by the City Manager, or their designee, in accordance with this section.

(c) Customers who meet the requirements of this section may receive an Adjustment that reduces the amount owed to the City for water service due to a Qualifying Leak. Specifically, to receive an Adjustment under this section, a Customer must:

(1) Submit a complete application in accordance with this section using a form and submission method required by the City Manager or their designee;

(2) Meet all the requirements of this section;

(3) Not have received Adjustment under this section within the preceding twelve (12) months;

(4) Except as provided in subsection (k), repair the Qualifying Leak within thirty (30) days of the date of detection. The date of detection may be assumed by the City Manager, or their designee, to be prior to the date an application is submitted or on a date established by Billed Usage;

(5) Submit evidence demonstrating to the satisfaction of the City Manager, or their designee, that the Qualifying Leak has been repaired in accordance with all applicable City ordinances, codes, rules, and regulations;

(6) Except as provided in subsection (j), obtain any permits required by any applicable City ordinances, codes, and regulations;

(7) Pass any inspections of the repair required by any applicable City ordinances, codes, and regulations; and

(8) Not have received a citation for a violation of any provision of Sections 26-233, 26-234, or 28-446 within the ninety (90) days prior to repair of the Qualifying Leak.

(d) Repairs under subsection (c)(4) requiring permitting and inspection may be made by the property owner or by a licensed professional.

(e) Except as provided in subsection (k), an application for an Adjustment must be submitted within sixty (60) days of repair of a Qualifying Leak. The Customer must submit all documentation requested by the City Manager or their designee. Requested documentation may include, without limitation, any or all of the following items:

(1) a repair invoice;

(2) a parts receipt;

(3) a letter from a licensed professional certifying the repair is completed; and

(4) any other information documenting the repair deemed sufficient by the City Manager or their designee.

The method required for submission of evidence of repair under this section will be determined by the City Manager or their designee. The application form shall contain a statement setting forth an understanding that the application

is a government record subject to criminal prosecution for false statements under Chapter 37 of the Texas Penal Code, and the Customer must state that the application and attached evidence contains no false statements.

(f) Qualifying Leaks meeting all the requirements of this section shall receive an Adjustment for up to two consecutive billing periods at the Leak Adjustment Rate for up to 100,000 gallons. The City Manager, or their designee, shall calculate an Adjustment by:

(1) Determining the Customer's Billed Usage;

(2) Determining the Customer's Normal Expected Usage;

(3) Determining the Customer's Adjusted Usage by calculating the difference between their Billed Usage and their Normal Expected Usage; and

(4) Multiplying the Customer's Adjusted Usage by the Leak Adjustment Rate.

An example calculation for a Customer who qualifies for an Adjustment is as follows:

Adjusted Usage Calculation			**Adjustment Calculation**		
Billed Usage		$75.00	Adjusted Usage		$50.00
Normal Expected Usage	-	$25.00	Leak Adjustment Rate	x	.50
Adjustment		$50.00	Adjustment		$25.00

(g) Water usage not subject to this section will be billed according to the applicable rates established by the City Council and amended from time to time.

(h) All Adjustments will be issued as a credit to the Customer's account. Adjustments will not be applied to a Customer's account until one full, leak-free month of service has been billed. To avoid penalties, interest, or interruption during the Adjustment process, a Customer must follow standard payment processes including, without limitation, payment of billed charges or entering into a payment arrangement.

(i) Adjustments are provided as a courtesy to Customers and are not an entitlement. Customers are responsible for all usage and billed amounts not adjusted under this section. Denton City Charter, Sec. 12.02 prohibits the provision of free service.

(j) Customers who rent a service location and who do not have the legal authority to obtain permits required by the City may qualify for an Adjustment without obtaining the permits, if the following conditions are met:

(1) The Customer must provide written documentation evidencing, to the satisfaction of the City Manager, or their designee, their efforts to inform the property owner of the Qualifying Leak;

(2) The Customer must provide written documentation evidencing to the satisfaction of the City Manager, or their designee, their efforts to inform the property owner that repair of the Qualifying Leak requires permit(s); and

(3) The Customer must comply with all other requirements of this section.

(k) An extension of the application deadline in subsection (e) of up to fourteen (14) days may be granted under the authority of the City Manager, or their designee. Requests for an extension of the repair deadline in subsection (c) or requests for an extension greater than fourteen days for the application deadline in subsection (e) may be granted under the authority of the City Manager, or their designee, if the Customer submits evidence establishing good cause for the extension. Examples of good cause include, but are not limited to:

(1) Force majeure due to natural causes with no human intervention contributing to its occurrence;

(2) Excessive residential repair costs; and

(3) Critical illness.

(l) Notwithstanding any conflicting provision of this section, any Billed Usage in excess of ten (10) times the Normal Expected Usage may be Adjusted by up to $2,000. To receive this credit, the following criteria must be met:

(1) The Leak associated with the Billed Usage must be a Qualifying Leak;

(2) The Qualifying Leak must not exceed two billing periods;

(3) The Customer must meet all other applicable requirements of this section;

(4) The Customer may not have received a previous Adjustment under this subsection (m) for the affected account;

(5) The City Manager, or their designee, must conduct an investigation and obtain evidence establishing that the increased usage was not the result of the Customer's failure to take reasonable action(s) to correct or address the Qualifying Leak. If the initial investigation reveals a billing or meter error, the Customer's account may be adjusted under the authorization of Section 26-23(3)(a);

(6) The City Manager must review and approve the Adjustment; and

(7) City Council must receive a timely report of uses of this subsection (l).

(m) If a Customer's Normal Expected Usage under this section would reduce their wastewater volume, as calculated under the City's then-applicable rate book, then a separate wastewater adjustment may occur as authorized by Section 26-23(3)(c).

(n) Notwithstanding any deadlines provided in this section, a Customer may receive an Adjustment under subsection (l) for a Qualifying Leak that occurred in the twenty-four (24) months prior to January 1, 2026.

(o) Submitting an application does not remove a Customer's responsibility to pay for water service. To avoid penalties, interest, and/or interruption during the Adjustment process, a Customer must follow standard payment processes including, without limitation, payment of billed charges or entering into a payment arrangement.

(p) This section does not create any rights to an appeal of the City's decision whether to apply an Adjustment and the initial determination by City Manager or their designee shall be considered final and non-appealable.

~~(b) Any program administered by the city is provided as a courtesy to customers and is not an entitlement. Customers are responsible for any billed charges which are not covered under the program or do not qualify for bill adjustments as set forth in Denton City Charter, Section 12.02 which prohibits the provision of free service. Application for a leak adjustment under the program does not remove a customer's financial responsibility for service. To avoid penalties, interest, and/or interruption during the adjustment process, customers must follow standard payment processes which may include payment of billed charges or entering a payment arrangement.~~

~~(c) The city shall provide a program which provides bill credit for charges incurred due to a leak. The program shall:~~

~~(1) Provide criteria that must be met for issuance of an adjustment under the program;~~

~~(2) Define program restrictions;~~

~~(3) Define method(s) excess usage calculation and provide an adjustment rate; and~~

~~(4) Define actions, steps, methods, and timelines related to processing and issuing adjustments.~~

~~(d) The program administrator shall ensure any revision of the written program document be:~~

~~(1) Approved by the city manager;~~

~~(2) On file with the city;~~

~~(3) Publicly available on the city website; and~~

~~(4) Provided to the city council prior to implementation.~~

~~(e) As a measure of protection for the safety and security of the potable water supply, a leak shall, at minimum, meet the following criteria in order to qualify for the program:~~

~~(1) Corrective repairs shall be completed and documented as required by the program;~~

~~(2) Any required permits shall be obtained;~~

~~(3) All repairs shall pass any inspection as required by state or local law;~~

~~(f) On an annual basis, the city council shall receive a report on program performance.~~

(Code 1966, § 25-36; Ord. No. 2001-200, § 1, 5-15-01; Ord. No. 2005-092, § 1, 3-22-05; Ord. No. 22-319, § 1, 3-22-22)

City of Denton

City Hall
215 E. McKinney Street
Denton, Texas
www.cityofdenton.com

AGENDA INFORMATION SHEET

DEPARTMENT: Procurement

ACM: Christine Taylor

DATE: December 15, 2025

SUBJECT

Consider recommending adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute a Professional Services Agreement with Lockwood, Andrews & Newnam, Inc., for engineering services for the Lift Station Rehabilitation Project for the Water Utilities Department as set forth in the contract; providing for the expenditure of funds therefor; and providing an effective date (RFQ 8213-011 – Professional Services Agreement for engineering services awarded to Lockwood, Andrews & Newnam, Inc., in the not-to-exceed amount of $735,520.00).

STRATEGIC ALIGNMENT

This action supports Key Focus Area: Enhance Infrastructure and Mobility.

INFORMATION/BACKGROUND

This proposed contract is a Professional Services Agreement with Lockwood, Andrews & Newnam, Inc., for the Lift Station Rehabilitation Project. The rehabilitation of lift stations is essential for the ongoing operation of wastewater management systems. These stations are crucial for moving sewage to higher elevations when gravity flow is insufficient. As they age, issues such as corrosion and wear can develop, potentially leading to environmental contamination and non-compliance with Texas Commission on Environmental Quality (TCEQ) regulations. Upgrading these stations helps prevent such problems, ensures efficient operation, reduces maintenance costs, and supports future growth. Most importantly, it maintains safe and reliable wastewater services for communities. Overall, it is a strategic step to preserve infrastructure integrity and system dependability.

In 2023, a comprehensive condition assessment was conducted to evaluate the 31 lift stations managed by the City of Denton, leading to a prioritized ranking based on their serviceability. The Water Utilities Department is launching a multi-year rehabilitation program, starting with the stations identified as the highest risk. This approach will help ensure that the lift stations continue to operate safely and reliably for years to come.

This contract covers the design phase of the rehabilitation for four (4) lift stations identified as being in a higher-risk condition of serviceability.

List Stations to be designed under this contract:

- Bent Oaks
- Southfork
- Sundown
- Vacation Village

Lift Station	Design Cost
South Fork	$84,250
Sundown Ranch	217,090
Bent Oaks	217,090
Vacation Village	217,090
Total	**$735,520**

Request for Qualifications for an engineering services list for various water and wastewater utilities projects for the Water Utilities Department was solicited using the City's formal solicitation process. City Council approved a pre-qualified list of professional service firms on March 5, 2024 (Ordinance 24-390).

PRIOR ACTION/REVIEW (COUNCIL, BOARDS, COMMISSIONS)

On March 5, 2024, City Council approved RFQ 8213 for a prequalified list of firms for engineering services for various water and wastewater utilities projects for the Water Utilities Department (Ordinance 24-390).

RECOMMENDATION

Award a contract with Lockwood, Andrews & Newnam, Inc., for engineering services for the Lift Station Rehabilitation for the Water Utilities Department, in the not-to-exceed amount of $735,520.

PRINCIPAL PLACE OF BUSINESS

Lockwood, Andrews & Newnam, Inc.
Frisco, TX

SUSTAINABILITY MEASURES

The contract will deliver comprehensive engineering design and construction/rehabilitation phase services to the City of Denton. The project aims to rehabilitate existing lift stations, ensuring safe and reliable wastewater service.

ESTIMATED SCHEDULE OF PROJECT

The design portion of this project is expected to take approximately one (1) year.

FISCAL INFORMATION

These services will be funded through the bonds in the 5-year Capital Improvement Program, account 640530545.1360.21100. Requisition #173212 has been entered into the purchasing software system for the amount of $735,520. The budgeted amount of this item is $735,520.

EXHIBITS

Exhibit 1: Agenda Information Sheet
Exhibit 2: Ordinance and Contract

Respectfully submitted:
Lori Hewell, 940-349-7100
Purchasing Manager

For information concerning this acquisition, contact: Jason Donnell, 940-349-8275.

Legal point of contact: Marcella Lunn at 940-349-8333.

ORDINANCE NO. _____

AN ORDINANCE OF THE CITY OF DENTON, A TEXAS HOME-RULE MUNICIPAL CORPORATION, AUTHORIZING THE CITY MANAGER TO EXECUTE A PROFESSIONAL SERVICES AGREEMENT WITH LOCKWOOD, ANDREWS & NEWNAM, INC., FOR ENGINEERING SERVICES FOR THE LIFT STATION REHABILITATION PROJECT FOR THE WATER UTILITIES DEPARTMENT AS SET FORTH IN THE CONTRACT; PROVIDING FOR THE EXPENDITURE OF FUNDS THEREFOR; AND PROVIDING AN EFFECTIVE DATE (RFQ 8213-011 – PROFESSIONAL SERVICES AGREEMENT FOR ENGINEERING SERVICES AWARDED TO LOCKWOOD, ANDREWS & NEWNAM, INC., IN THE NOT-TO-EXCEED AMOUNT OF $735,520.00).

WHEREAS, on March 5, 2024, the City Council approved a pre-qualified engineer list for the Water and Wastewater Utilities Department (Ordinance 24-390), and the professional services provider (the "Provider") mentioned in this ordinance is being selected as the most highly qualified on the basis of its demonstrated competence and qualifications to perform the proposed professional services; and

WHEREAS, this procurement was undertaken as part of the City's governmental function [Water and sewer service]; and

WHEREAS, the fees under the proposed contract are fair and reasonable and are consistent with, and not higher than, the recommended practices and fees published by the professional associations applicable to the Provider's profession, and such fees do not exceed the maximum provided by law; NOW, THEREFORE,

THE COUNCIL OF THE CITY OF DENTON HEREBY ORDAINS:

SECTION 1. The City Manager, or their designee, is hereby authorized to enter into an agreement with Lockwood, Andrews & Newnam, Inc., for engineering services for the Lift Station Rehabilitation Project for the Water Utilities Department, a copy of which is attached hereto and incorporated by reference herein.

SECTION 2. The City Manager, or their designee, is authorized to expend funds as required by the attached contract.

SECTION 3. The City Council of the City of Denton, hereby expressly delegates the authority to take any actions that may be required or permitted to be performed by the City of Denton under this ordinance to the City Manager of the City of Denton, or their designee.

SECTION 4. The findings in the preamble of this ordinance are incorporated herein by reference.

SECTION 5. This ordinance shall become effective immediately upon its passage and approval.

The motion to approve this ordinance was made by _____ and seconded by _____. This ordinance was passed and approved by the following vote [___ - ___]:

	Aye	**Nay**	**Abstain**	**Absent**
Mayor Gerard Hudspeth:	_____	_____	_____	_____
Vicki Byrd, District 1:	_____	_____	_____	_____
Brian Beck, District 2:	_____	_____	_____	_____
Suzi Rumohr, District 3:	_____	_____	_____	_____
Joe Holland, District 4:	_____	_____	_____	_____
Brandon Chase McGee, At Large Place 5:	_____	_____	_____	_____
Jill Jester, At Large Place 6:	_____	_____	_____	_____

PASSED AND APPROVED this the _____ day of _____, 2025.

_____
GERARD HUDSPETH, MAYOR

ATTEST:
INGRID REX, CITY SECRETARY

BY: _____

APPROVED AS TO LEGAL FORM:
MACK REINWAND, CITY ATTORNEY

BY: Leah Bush

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Docusign City Council Transmittal Coversheet

PSA	8213-011
File Name	Lift Station Rehabilitation Project
Purchasing Contact	Gabby Leeper
City Council Target Date	
Piggy Back Option	Not Applicable
Contract Expiration	
Ordinance	

DS
LH

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CITY OF DENTON, TEXAS

STANDARD AGREEMENT FOR ENGINEERING RELATED PROFESSIONAL SERVICES

This AGREEMENT is between the City of Denton, a Texas home-rule municipality ("CITY"), and Lockwood, Andrews & Newnam, Inc., with its corporate office at 2925 Briarpark Drive Houston, TX 77042 and authorized to do business in Texas, ("ENGINEER"), for a PROJECT generally described as: Lift Station Rehabilitation Project (the "PROJECT").

SECTION 1
Scope of Services

A. The CITY hereby agrees to retain the ENGINEER, and the ENGINEER hereby agrees to perform, professional engineering services set forth in the Scope of Services attached hereto as Attachment A. These services shall be performed in connection with the PROJECT.

B. Additional services, if any, will be requested in writing by the CITY. CITY shall not pay for any work performed by ENGINEER or its consultants, subcontractors and/or suppliers that has not been ordered in advance and in writing. It is specifically agreed that ENGINEER shall not be compensated for any additional work resulting from oral orders of any person.

SECTION 2
Compensation and Term of Agreement

A. The ENGINEER shall be compensated for all services provided pursuant to this AGREEMENT in an amount not to exceed $735,520.00 in the manner and in accordance with the fee schedule as set forth in Attachment B. Payment shall be considered full compensation for all labor, materials, supplies, and equipment necessary to complete the services described in Attachment A.

B. Unless otherwise terminated pursuant to Section 6. D. herein, this AGREEMENT shall be for a term beginning upon the effective date, as described below, and shall continue for a period which may reasonably be required for the completion of the PROJECT, until the expiration of the funds, or completion of the PROJECT and acceptance by the CITY, whichever occurs first. ENGINEER shall proceed diligently with the PROJECT to completion as described in the PROJECT schedule as set forth in Attachment A.

SECTION 3
Terms of Payment

Payments to the ENGINEER will be made as follows:

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A. Invoice and Payment

(1) The Engineer shall provide the City sufficient documentation, including but not limited to meeting the requirements set forth in the PROJECT schedule as set forth in Attachment A to reasonably substantiate the invoices.

(2) The ENGINEER will issue monthly invoices for all work performed under this AGREEMENT. Invoices for the uncontested performance of the particular services are due and payable within 30 days of receipt by City.

(3) Upon completion of services enumerated in Section 1, the final payment of any balance for the uncontested performance of the services will be due within 30 days of receipt of the final invoice.

(4) In the event of a disputed or contested billing, only that portion so contested will be withheld from payment, and the undisputed portion will be paid. The CITY will exercise reasonableness in contesting any bill or portion thereof. No interest will accrue on any contested portion of the billing until mutually resolved.

(5) If the CITY fails to make payment in full to ENGINEER for billings contested in good faith within 60 days of the amount due, the ENGINEER may, after giving 7 days' written notice to CITY, suspend services under this AGREEMENT until paid in full. In the event of suspension of services, the ENGINEER shall have no liability to CITY for delays or damages caused the CITY because of such suspension of services.

SECTION 4
Obligations of the Engineer

A. General

The ENGINEER will serve as the CITY's professional engineering representative under this AGREEMENT, providing professional engineering consultation and advice and furnishing customary services incidental thereto.

B. Standard of Care

The ENGINEER shall perform its services:

(1) with the professional skill and care ordinarily provided by competent engineers practicing in the same or similar locality and under the same or similar circumstances and professional license; and

(2) as expeditiously as is prudent considering the ordinary professional skill and care of a competent engineer.

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C. Subsurface Investigations

(1) The ENGINEER shall advise the CITY with regard to the necessity for subcontract work such as special surveys, tests, test borings, or other subsurface investigations in connection with design and engineering work to be performed hereunder. The ENGINEER shall also advise the CITY concerning the results of same. Such surveys, tests, and investigations shall be furnished by the CITY, unless otherwise specified in Attachment A.

(2) In soils, foundation, groundwater, and other subsurface investigations, the actual characteristics may vary significantly between successive test points and sample intervals and at locations other than where observations, exploration, and investigations have been made. Because of the inherent uncertainties in subsurface evaluations, changed or unanticipated underground conditions may occur that could affect the total PROJECT cost and/or execution. These conditions and cost/execution effects are not the responsibility of the ENGINEER.

D. Preparation of Engineering Drawings

The ENGINEER will provide to the CITY the original drawings of all plans in ink on reproducible mylar sheets and electronic files in .pdf format, or as otherwise approved by CITY, which shall become the property of the CITY. CITY may use such drawings in any manner it desires; provided, however, that the ENGINEER shall not be liable for the use of such drawings for any project other than the PROJECT described herein.

E. Engineer's Personnel at Construction Site

(1) The presence or duties of the ENGINEER's personnel at a construction site, whether as on-site representatives or otherwise, do not make the ENGINEER or its personnel in any way responsible for those duties that belong to the CITY and/or the CITY's construction contractors or other entities, and do not relieve the construction contractors or any other entity of their obligations, duties, and responsibilities, including, but not limited to, all construction methods, means, techniques, sequences, and procedures necessary for coordinating and completing all portions of the construction work in accordance with the AGREEMENT Documents and any health or safety precautions required by such construction work. The ENGINEER and its personnel have no authority to exercise any control over any construction contractor or other entity or their employees in connection with their work or any health or safety precautions.

(2) Except to the extent of specific site visits expressly detailed and set forth in Attachment A, the ENGINEER or its personnel shall have no obligation or responsibility to visit the construction site to become familiar with the progress or quality of the completed work on the PROJECT or to determine, in general, if the work on the PROJECT is being performed in a manner indicating that the

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PROJECT, when completed, will be in accordance with the AGREEMENT Documents, nor shall anything in the AGREEMENT Documents or this AGREEMENT between CITY and ENGINEER be construed as requiring ENGINEER to make exhaustive or continuous on-site inspections to discover latent defects in the work or otherwise check the quality or quantity of the work on the PROJECT. If the ENGINEER makes on-site observation(s) of a deviation from the AGREEMENT Documents, the ENGINEER shall inform the CITY.

(3) When professional certification of performance or characteristics of materials, systems or equipment is reasonably required to perform the services set forth in the Scope of Services, the ENGINEER shall be entitled to rely upon such certification to establish materials, systems or equipment and performance criteria to be required in the AGREEMENT Documents.

F. Opinions of Probable Cost, Financial Considerations, and Schedules

(1) The ENGINEER shall provide opinions of probable costs based on the current available information at the time of preparation, in accordance with Attachment A.

(2) In providing opinions of cost, financial analyses, economic feasibility projections, and schedules for the PROJECT, the ENGINEER has no control over cost or price of labor and materials; unknown or latent conditions of existing equipment or structures that may affect operation or maintenance costs; competitive bidding procedures and market conditions; time or quality of performance by third parties; quality, type, management, or direction of operating personnel; and other economic and operational factors that may materially affect the ultimate PROJECT cost or schedule. Therefore, the ENGINEER makes no warranty that the CITY's actual PROJECT costs, financial aspects, economic feasibility, or schedules will not vary from the ENGINEER's opinions, analyses, projections, or estimates.

G. Construction Progress Payments

Recommendations by the ENGINEER to the CITY for periodic construction progress payments to the construction contractor will be based on the ENGINEER's knowledge, information, and belief from selective sampling and observation that the work has progressed to the point indicated. Such recommendations do not represent that continuous or detailed examinations have been made by the ENGINEER to ascertain that the construction contractor has completed the work in exact accordance with the AGREEMENT Documents; that the final work will be acceptable in all respects; that the ENGINEER has made an examination to ascertain how or for what purpose the construction contractor has used the moneys paid; that title to any of the work, materials, or equipment has passed to the CITY free and clear of liens, claims, security interests, or encumbrances; or that there are not other matters at issue between the CITY and the construction contractor that affect the amount that should be paid.

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H. Record Drawings

Record drawings, if required, will be prepared, in part, on the basis of information compiled and furnished by others, and may not always represent the exact location, type of various components, or exact manner in which the PROJECT was finally constructed. The ENGINEER is not responsible for any errors or omissions in the information from others that is incorporated into the record drawings.

I. Right to Audit

(1) ENGINEER agrees that the CITY shall, until the expiration of five (5) years after final payment under this AGREEMENT, have access to and the right to examine and photocopy any directly pertinent books, documents, papers and records of the ENGINEER involving transactions relating to this AGREEMENT. ENGINEER agrees that the CITY shall have access during normal working hours to all necessary ENGINEER facilities and shall be provided adequate and appropriate work space in order to conduct audits in compliance with the provisions of this section. The CITY shall give ENGINEER reasonable advance notice of intended audits.

(2) ENGINEER further agrees to include in all its subconsultant agreements hereunder a provision to the effect that the subconsultant agrees that the CITY shall, until the expiration of five (5) years after final payment under the subcontract, have access to and the right to examine and photocopy any directly pertinent books, documents, papers and records of such subconsultant, involving transactions to the subcontract, and further, that the CITY shall have access during normal working hours to all subconsultant facilities, and shall be provided adequate and appropriate work space, in order to conduct audits in compliance with the provisions of this section together with subsection (3) hereof. CITY shall give subconsultant reasonable advance notice of intended audits.

(3) ENGINEER and subconsultant agree to photocopy such documents as may be requested by the CITY. The CITY agrees to reimburse ENGINEER for the cost of copies at the rate published in the Texas Administrative Code in effect as of the time copying is performed.

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J. INSURANCE

(1) ENGINEER'S INSURANCE

a. Commercial General Liability – the ENGINEER shall maintain commercial general liability (CGL) and, if necessary, commercial umbrella insurance with a limit of not less than $1,000,000.00 per each occurrence with a $2,000,000.00 aggregate. If such Commercial General Liability insurance contains a general aggregate limit, it shall apply separately to this PROJECT or location.

   i. The CITY shall be included as an additional insured with all rights of defense under the CGL, using ISO additional insured endorsement or a substitute providing equivalent coverage, and under the commercial umbrella, if any. This insurance shall apply as primary insurance with respect to any other insurance or self-insurance programs afforded to the CITY. The Commercial General Liability insurance policy shall have no exclusions or endorsements that would alter or nullify: premises/operations, products/completed operations, contractual, personal injury, or advertising injury, which are normally contained within the policy, unless the CITY specifically approves such exclusions in writing.

   ii. ENGINEER waives all rights against the CITY and its agents, officers, directors and employees for recovery of damages to the extent these damages are covered by the commercial general liability or commercial umbrella liability insurance maintained in accordance with this AGREEMENT.

b. Business Auto – the ENGINEER shall maintain business auto liability and, if necessary, commercial umbrella liability insurance with a limit of not less than $1,000,000 each accident. Such insurance shall cover liability arising out of "any auto", including owned, hired, and non-owned autos, when said vehicle is used in the course of the PROJECT. If the engineer owns no vehicles, coverage for hired or non-owned is acceptable.

   i. ENGINEER waives all rights against the CITY and its agents, officers, directors and employees for recovery of damages to the extent these damages are covered by the business auto liability or commercial umbrella liability insurance obtained by ENGINEER pursuant to this AGREEMENT or under any applicable auto physical damage coverage.

c. Workers' Compensation – ENGINEER shall maintain workers compensation and employers liability insurance and, if necessary,

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commercial umbrella liability insurance with a limit of not less than $100,000.00 each accident for bodily injury by accident or $100,000.00 each employee for bodily injury by disease, with $500,000.00 policy limit.

i. ENGINEER waives all rights against the CITY and its agents, officers, directors and employees for recovery of damages to the extent these damages are covered by workers compensation and employer's liability or commercial umbrella insurance obtained by ENGINEER pursuant to this AGREEMENT.

d. Professional Liability – ENGINEER shall maintain professional liability, a claims-made policy, with a minimum of $1,000,000.00 per claim and aggregate. The policy shall contain a retroactive date prior to the date of the AGREEMENT or the first date of services to be performed, whichever is earlier. Coverage shall be maintained for a period of 5 years following the completion of the AGREEMENT. An annual certificate of insurance specifically referencing this PROJECT shall be submitted to the CITY for each year following completion of the AGREEMENT.

(2) GENERAL INSURANCE REQUIREMENTS

a. Certificates of insurance evidencing that the ENGINEER has obtained all required insurance shall be attached to this AGREEMENT prior to its execution.

b. Applicable policies shall be endorsed to name the CITY an Additional Insured thereon, subject to any defense provided by the policy, as its interests may appear. The term CITY shall include its employees, officers, officials, agents, and volunteers as respects the contracted services.

c. Certificate(s) of insurance shall document that insurance coverage specified in this AGREEMENT are provided under applicable policies documented thereon.

d. Any failure on part of the CITY to attach the required insurance documentation hereto shall not constitute a waiver of the insurance requirements.

e. A minimum of thirty (30) days notice of cancellation or material change in coverage shall be provided to the CITY. A ten (10) days notice shall be acceptable in the event of non-payment of premium. Notice shall be sent to the respective Department Director (by name), City of Denton, 901 Texas Street, Denton, Texas 76209.

f. Insurers for all policies must be authorized to do business in the State of

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Texas and have a minimum rating of A:V or greater, in the current A.M. Best Key Rating Guide or have reasonably equivalent financial strength and solvency to the satisfaction of Risk Management.

g. Any deductible or self insured retention in excess of $25,000.00 that would change or alter the requirements herein is subject to approval by the CITY in writing, if coverage is not provided on a first-dollar basis. The CITY, at it sole discretion, may consent to alternative coverage maintained through insurance pools or risk retention groups. Dedicated financial resources or letters of credit may also be acceptable to the CITY.

h. Applicable policies shall each be endorsed with a waiver of subrogation in favor of the CITY as respects the PROJECT.

i. The CITY shall be entitled, upon its request and without incurring expense, to review the ENGINEER's insurance policies including endorsements thereto and, at the CITY's discretion; the ENGINEER may be required to provide proof of insurance premium payments.

j. Lines of coverage, other than Professional Liability, underwritten on a claims-made basis, shall contain a retroactive date coincident with or prior to the date of the AGREEMENT. The certificate of insurance shall state both the retroactive date and that the coverage is claims-made.

k. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption nor restrictive modification or changes from date of commencement of the PROJECT until final payment and termination of any coverage required to be maintained after final payments.

l. The CITY shall not be responsible for the direct payment of any insurance premiums required by this AGREEMENT.

m. Sub consultants and subcontractors to/of the ENGINEER shall be required by the ENGINEER to maintain the same or reasonably equivalent insurance coverage as required for the ENGINEER. When sub consultants/subcontractors maintain insurance coverage, ENGINEER shall provide CITY with documentation thereof on a certificate of insurance.

K. Independent Consultant

The ENGINEER agrees to perform all services as an independent consultant and not as a subcontractor, agent, or employee of the CITY. The doctrine of *respondeat superior* shall not apply.

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L. Disclosure

The ENGINEER acknowledges to the CITY that it has made full disclosure in writing of any existing conflicts of interest or potential conflicts of interest, including personal financial interest, direct or indirect, in property abutting the proposed PROJECT and business relationships with abutting property cities. The ENGINEER further acknowledges that it will make disclosure in writing of any conflicts of interest that develop subsequent to the signing of this AGREEMENT and prior to final payment under the AGREEMENT.

M. Asbestos or Hazardous Substances

(1) If asbestos or hazardous substances in any form are encountered or suspected, the ENGINEER will stop its own work in the affected portions of the PROJECT to permit testing and evaluation.

(2) If asbestos or other hazardous substances are suspected, the CITY may request the ENGINEER to assist in obtaining the services of a qualified subcontractor to manage the remediation activities of the PROJECT.

N. Permitting Authorities - Design Changes

If permitting authorities require design changes so as to comply with published design criteria and/or current engineering practice standards which the ENGINEER should have been aware of at the time this AGREEMENT was executed, the ENGINEER shall revise plans and specifications, as required, at its own cost and expense. However, if design changes are required due to the changes in the permitting authorities' published design criteria and/or practice standards criteria which are published after the date of this AGREEMENT which the ENGINEER could not have been reasonably aware of, the ENGINEER shall notify the CITY of such changes and an adjustment in compensation will be made through an amendment to this AGREEMENT.

O. Schedule

ENGINEER shall manage the PROJECT in accordance with the schedule developed per Attachment A to this AGREEMENT.

P. Equal Opportunity

(1) **Equal Employment Opportunity:** ENGINEER and ENGINEER's agents shall engage in any discriminatory employment practice. No person shall, on the grounds of race, sex, sexual orientation, age, disability, creed, color, genetic testing, or national origin, be refused the benefits of, or be otherwise subjected to discrimination under any activities resulting from this AGREEMENT.

(2) **Americans with Disabilities Act (ADA) Compliance:** ENGINEER and

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ENGINEER's agents shall not engage in any discriminatory employment practice against individuals with disabilities as defined in the ADA.

SECTION 5
Obligations of the City

A. City-Furnished Data

ENGINEER may rely upon the accuracy, timeliness, and completeness of the information provided by the CITY.

B. Access to Facilities and Property

The CITY will make its facilities accessible to the ENGINEER as required for the ENGINEER's performance of its services. The CITY will perform, at no cost to the ENGINEER, such tests of equipment, machinery, pipelines, and other components of the CITY's facilities as may be required in connection with the ENGINEER's services. The CITY will be responsible for all acts of the CITY's personnel.

C. Advertisements, Permits, and Access

Unless otherwise agreed to in the Scope of Services, the CITY will obtain, arrange, and pay for all advertisements for bids; permits and licenses required by local, state, or federal authorities; and land, easements, rights-of-way, and access necessary for the ENGINEER's services or PROJECT construction.

D. Timely Review

The CITY will examine the ENGINEER's studies, reports, sketches, drawings, specifications, proposals, and other documents; obtain advice of an attorney, insurance counselor, accountant, auditor, bond and financial advisors, and other consultants as the CITY deems appropriate; and render in writing decisions required by the CITY in a timely manner in accordance with the PROJECT schedule prepared in accordance with Attachment A.

E. Prompt Notice

The CITY will give prompt written notice to the ENGINEER whenever CITY observes or becomes aware of any development that affects the scope or timing of the ENGINEER's services or of any defect in the work of the ENGINEER or construction contractors.

F. Asbestos or Hazardous Substances Release.

(1) CITY acknowledges ENGINEER will perform part of the work at CITY's

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facilities that may contain hazardous materials, including asbestos containing materials, or conditions, and that ENGINEER had no prior role in the generation, treatment, storage, or disposition of such materials. In consideration of the associated risks that may give rise to claims by third parties or employees of City, City hereby releases ENGINEER from any damage or liability related to the presence of such materials.

(2) The release required above shall not apply in the event the discharge, release or escape of hazardous substances, contaminants, or asbestos is a result of ENGINEER's negligence or if ENGINEER brings such hazardous substance, contaminant or asbestos onto the PROJECT.

G. Contractor Indemnification and Claims

The CITY agrees to include in all construction contracts the provisions of Article IV.E. regarding the ENGINEER's Personnel at Construction Site, and provisions providing for contractor indemnification of the CITY and the ENGINEER for contractor's negligence.

H. Contractor Claims and Third-Party Beneficiaries

(1) The CITY agrees to include the following clause in all contracts with construction contractors and equipment or materials suppliers:

> "Contractors, subcontractors and equipment and materials suppliers on the PROJECT, or their sureties, shall maintain no direct action against the ENGINEER, its officers, employees, and subcontractors, for any claim arising out of, in connection with, or resulting from the engineering services performed. Only the CITY will be the beneficiary of any undertaking by the ENGINEER."

(2) This AGREEMENT gives no rights or benefits to anyone other than the CITY and the ENGINEER and there are no third-party beneficiaries.

(3) The CITY will include in each agreement it enters into with any other entity or person regarding the PROJECT a provision that such entity or person shall have no third-party beneficiary rights under this AGREEMENT.

(4) Nothing contained in this Section H. shall be construed as a waiver of any right the CITY has to bring a claim against ENGINEER.

I. CITY's Insurance

(1) The CITY may maintain property insurance on certain pre-existing structures associated with the PROJECT.

(2) The CITY may secure Builders Risk/Installation insurance at the replacement

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cost value of the PROJECT. The CITY may provide ENGINEER a copy of the policy or documentation of such on a certificate of insurance.

J. Litigation Assistance

The Scope of Services does not include costs of the ENGINEER for required or requested assistance to support, prepare, document, bring, defend, or assist in litigation undertaken or defended by the CITY. In the event CITY requests such services of the ENGINEER, this AGREEMENT shall be amended or a separate agreement will be negotiated between the parties.

K. Changes

The CITY may make or approve changes within the general Scope of Services in this AGREEMENT. If such changes affect the ENGINEER's cost of or time required for performance of the services, an equitable adjustment will be made through an amendment to this AGREEMENT with appropriate CITY approval.

SECTION 6
General Legal Provisions

A. Authorization to Proceed

ENGINEER shall be authorized to proceed with this AGREEMENT upon receipt of a written Notice to Proceed from the CITY.

B. Reuse of Project Documents

All designs, drawings, specifications, documents, and other work products of the ENGINEER, whether in hard copy or in electronic form, are instruments of service for this PROJECT, whether the PROJECT is completed or not. Reuse, change, or alteration by the CITY or by others acting through or on behalf of the CITY of any such instruments of service without the written permission of the ENGINEER will be at the CITY's sole risk. The CITY shall own the final designs, drawings, specifications and documents.

C. Force Majeure

The ENGINEER is not responsible for damages or delay in performance caused by acts of God, strikes, lockouts, accidents, or other events beyond the control of the ENGINEER that prevent ENGINEER’s performance of its obligations hereunder.

D. Termination

(1) This AGREEMENT may be terminated:

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a. by the City for its convenience upon 30 days' written notice to ENGINEER.

b. by either the CITY or the ENGINEER for cause if either party fails substantially to perform through no fault of the other and the nonperforming party does not commence correction of such nonperformance within 5 days' written notice or thereafter fails to diligently complete the correction.

(2) If this AGREEMENT is terminated for the convenience of the City, the ENGINEER will be paid for termination expenses as follows:

a. Cost of reproduction of partial or complete studies, plans, specifications or other forms of ENGINEER'S work product;

b. Out-of-pocket expenses for purchasing electronic data files and other data storage supplies or services;

c. The time requirements for the ENGINEER'S personnel to document the work underway at the time of the CITY'S termination for convenience so that the work effort is suitable for long time storage.

(3) Prior to proceeding with termination services, the ENGINEER will submit to the CITY an itemized statement of all termination expenses. The CITY'S approval will be obtained in writing prior to proceeding with termination services.

E. Suspension, Delay, or Interruption to Work

The CITY may suspend, delay, or interrupt the services of the ENGINEER for the convenience of the CITY. In the event of such suspension, delay, or interruption, an equitable adjustment in the PROJECT's schedule, commitment and cost of the ENGINEER's personnel and subcontractors, and ENGINEER's compensation will be made.

F. Indemnification

IN ACCORDANCE WITH TEXAS LOCAL GOVERNMENT CODE SECTION 271.904, THE ENGINEER SHALL INDEMNIFY OR HOLD HARMLESS THE CITY AGAINST LIABILITY FOR ANY DAMAGE COMMITTED BY THE ENGINEER OR ENGINEER'S AGENT, CONSULTANT UNDER CONTRACT, OR ANOTHER ENTITY OVER WHICH THE ENGINEER EXERCISES CONTROL TO THE EXTENT THAT THE DAMAGE IS CAUSED BY OR RESULTING FROM AN ACT OF NEGLIGENCE, INTENTIONAL TORT, INTELLECTUAL PROPERTY INFRINGEMENT, OR FAILURE TO PAY A SUBCONTRACTOR OR SUPPLIER. CITY IS ENTITLED TO RECOVER ITS REASONABLE ATTORNEY'S FEES IN PROPORTION TO THE ENGINEER'S LIABILITY.

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G. Assignment

Neither party shall assign all or any part of this AGREEMENT without the prior written consent of the other party.

H. Jurisdiction

The law of the State of Texas shall govern the validity of this AGREEMENT, its interpretation and performance, and any other claims related to it. The venue for any litigation related to this AGREEMENT shall be Denton County, Texas.

I. Severability and Survival

If any of the provisions contained in this AGREEMENT are held for any reason to be invalid, illegal, or unenforceable in any respect, such invalidity, illegality, or unenforceability will not affect any other provision, and this AGREEMENT shall be construed as if such invalid, illegal, or unenforceable provision had never been contained herein. Sections 5.F., 6.B., 6.D., 6.F., 6.H., and 6.I. shall survive termination of this AGREEMENT for any cause.

J. Observe and Comply

ENGINEER shall at all times observe and comply with all federal and State laws and regulations and with all City ordinances and regulations which in any way affect this AGREEMENT and the work hereunder, and shall observe and comply with all orders, laws ordinances and regulations which may exist or may be enacted later by governing bodies having jurisdiction or authority for such enactment. No plea of misunderstanding or ignorance thereof shall be considered. **ENGINEER AGREES TO DEFEND, INDEMNIFY AND HOLD HARMLESS CITY AND ALL OF ITS OFFICERS, AGENTS AND EMPLOYEES FROM AND AGAINST ALL CLAIMS OR LIABILITY ARISING OUT OF THE VIOLATION OF ANY SUCH ORDER, LAW, ORDINANCE, OR REGULATION, WHETHER IT BE BY ITSELF OR ITS EMPLOYEES**.

K. Immigration Nationality Act

ENGINEER shall verify the identity and employment eligibility of its employees who perform work under this AGREEMENT, including completing the Employment Eligibility Verification Form (I-9). Upon request by CITY, ENGINEER shall provide CITY with copies of all I-9 forms and supporting eligibility documentation for each employee who performs work under this AGREEMENT. ENGINEER shall adhere to all Federal and State laws as well as establish appropriate procedures and controls so that no services will be performed by any ENGINEER employee who is not legally eligible to perform such services. **ENGINEER SHALL INDEMNIFY CITY AND HOLD CITY HARMLESS FROM ANY PENALTIES, LIABILITIES, OR LOSSES DUE TO VIOLATIONS OF THIS PARAGRAPH BY ENGINEER, ENGINEER'S EMPLOYEES, SUBCONTRACTORS, AGENTS, OR LICENSEES.** CITY, upon written notice to ENGINEER, shall have the

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right to immediately terminate this AGREEMENT for violations of this provision by ENGINEER.

L. Prohibition on Contracts with Companies Boycotting Israel

Engineer acknowledges that in accordance with Chapter 2271 of the Texas Government Code, City is prohibited from entering into a contract with a company for goods or services unless the contract contains a written verification from the company that it: (1) does not boycott Israel; and (2) will not boycott Israel during the term of the contract. The terms "boycott Israel" and "company" shall have the meanings ascribed to those terms in Section 808.001 of the Texas Government Code. ***By signing this agreement, Engineer certifies that Engineer's signature provides written verification to the City that Engineer: (1) does not boycott Israel; and (2) will not boycott Israel during the term of the agreement.*** Failure to meet or maintain the requirements under this provision will be considered a material breach.

M. Prohibition on Contracts with Companies Doing Business with Iran, Sudan, or a Foreign Terrorist Organization

Sections 2252 and 2270 of the Texas Government Code restricts CITY from contracting with companies that do business with Iran, Sudan, or a foreign terrorist organization. ***By signing this agreement, Engineer certifies that Engineer's signature provides written verification to the City that Engineer, pursuant to Chapters 2252 and 2270, is not ineligible to enter into this agreement and will not become ineligible to receive payments under this agreement by doing business with Iran, Sudan, or a foreign terrorist organization***. Failure to meet or maintain the requirements under this provision will be considered a material breach.

N. Prohibition on Contracts with Companies Boycotting Certain Energy Companies

Engineer acknowledges that in accordance with Chapter 2274 of the Texas Government Code, City is prohibited from entering into a contract with a company for goods or services unless the contract contains written verification from the company that it (1) does not boycott energy companies; and (2) will not boycott energy companies during the term of the contract. The terms "boycott energy company" and "company" shall have the meanings ascribed to those terms in Section 809.001 of the Texas Government Code. ***By signing this agreement, Engineer certifies that Engineer's signature provides written verification to the City that Engineer: (1) does not boycott energy companies; and (2) will not boycott energy companies during the term of the agreement.*** Failure to meet or maintain the requirements under this provision will be considered a material breach.

O. Prohibition on Contracts with Companies Boycotting Certain Firearm Entities and Firearm Trade Associations

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Engineer acknowledges that in accordance with Chapter 2274 of the Texas Government Code, City is prohibited from entering into a contract with a company for goods or services unless the contract contains written verification from the company that it (1) does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association; and (2) will not discriminate during the term of the contract against a firearm entity or firearm trade association. The terms "discriminate against a firearm entity or firearm trade association," "firearm entity" and "firearm trade association" shall have the meanings ascribed to those terms in Chapter 2274 of the Texas Government Code. ***By signing this agreement, Engineer certifies that Engineer's signature provides written verification to the City that Engineer: (1) does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association; and (2) will not discriminate during the term of the contract against a firearm entity or firearm trade association.*** Failure to meet or maintain the requirements under this provision will be considered a material breach.

P. Termination Right for Contracts with Companies Doing Business with Certain Foreign-Owned Companies

The City of Denton may terminate this Contract immediately without any further liability if the City of Denton determines, in its sole judgment, that this Contract meets the requirements under Chapter 2274, and Engineer is, or will be in the future, (i) owned by or the majority of stock or other ownership interest of the company is held or controlled by individuals who are citizens of China, Iran, North Korea, Russia, or other designated country (ii) directly controlled by the Government of China, Iran, North Korea, Russia, or other designated country, or (iii) is headquartered in China, Iran, North Korea, Russia, or other designated country.

Q. Prohibition Against Personal Interest in Contracts

No officer, employee, independent consultant, or elected official of the City who is involved in the development, evaluation, or decision-making process of the performance of any solicitation shall have a financial interest, direct or indirect, in the Contract resulting from that solicitation as defined in the City's Ethic Ordinance 23-1165 and in the City Charter chapter 2 article XI(Ethics). Any willful violation of this section shall constitute impropriety in office, and any officer or employee guilty thereof shall be subject to disciplinary action up to and including dismissal. Any violation of this provision, with the knowledge, expressed or implied, of the Contractor shall render the Contract voidable by the City. The Contractor shall complete and submit the City's Conflict of Interest Questionnaire.

R. Certificate of Interested Parties Electronic Filing

In 2015, the Texas Legislature adopted House Bill 1295, which added section 2252.908 of the Government Code. The law states that the City may not enter into this contract

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unless the Contractor submits a disclosure of interested parties (Form 1295) to the City at the time the Contractor submits the signed contract. The Texas Ethics Commission has adopted rules requiring the business entity to file Form 1295 electronically with the Commission.

Contractor will be required to furnish a Certificate of Interest Parties before the contract is awarded, in accordance with Government Code 2252.908.

The contractor shall:

1. Log onto the State Ethics Commission Website at : https://www.ethics.state.tx.us/filinginfo/1295/
2. Register utilizing the tutorial provided by the State
3. Print a copy of the completed Form 1295
4. Enter the Certificate Number on page 2 of this contract.
5. Complete and sign the Form 1295
6. Email the form to purchasing@cityofdenton.com with the contract number in the subject line. (EX: Contract 1234 – Form 1295)

The City must acknowledge the receipt of the filed Form 1295 not later than the 30th day after Council award. Once a Form 1295 is acknowledged, it will be posted to the Texas Ethics Commission's website within seven business days.

S. Agreement Documents

This AGREEMENT, including its attachments and schedules, constitutes the entire AGREEMENT, which supersedes all prior written or oral understandings, and may only be changed by a written amendment executed by both parties. This AGREEMENT may be executed in one or more counterparts and each counterpart shall, for all purposes, be deemed an original, but all such counterparts shall together constitute but one and the same instrument. The following attachments and schedules are hereby made a part of this AGREEMENT:

Attachment A - Scope of Services
Attachment B - Compensation

These documents make up the AGREEMENT documents and what is called for by one shall be as binding as if called for by all. In the event of an inconsistency or conflict in any of the provisions of the AGREEMENT documents, the inconsistency or conflict shall be resolved by giving precedence first to the written AGREEMENT then to the AGREEMENT documents in the order in which they are listed above.

The parties agree to transact business electronically. Any statutory requirements that certain terms be in writing will be satisfied using electronic documents and signing. Electronic signing of this document will be deemed an original for all legal purposes.

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Duly executed by each party's designated representative to be effective on _____.

BY:
CITY OF DENTON, TEXAS

_____
Sara Hensley, City Manager

BY:
ENGINEER
Lockwood Andrews & Newnam, Inc.

DocuSigned by:
Justin Reeves
60CEB1BC62B4E6...
Vice President
Authorized Agent, Title

Full Name: Justin Reeves

_____
TEXAS ETHICS COMMISSION
CERTIFICATE NUMBER

ATTEST:
INGRID REX, INTERIM CITY SECRETARY

BY: _____

APPROVED AS TO LEGAL FORM:
MACK REINWAND, CITY ATTORNEY

BY: Signed by:
Leah Bush
2A936B08B5D7485...

THIS AGREEMENT HAS BEEN BOTH REVIEWED AND APPROVED as to financial and operational obligations and business terms.

Signed by:
Stephen D Gay
FE9A8BB9728E4A9...
Signature

General Manager
Title

Water Utilities and Street Operations
Department

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Attachment A

Southfork, Sundown Ranch, Bent Oaks, and Vacation Village Lift Stations Design Scope of Work

September 2025

This scope of work outlines the professional engineering tasks to be performed by **Lockwood, Andrews, & Newnam, Inc. (LAN)**, in association with the preliminary engineering, final design, bidding, and construction services, necessary to facilitate the improvements of the **City of Denton (City)** lift stations. The lift station designs included in this scope of work are:

- Southfork LS will be sized to convey flows based on the 2024 Kimley Horn Condition Assessment Reports that indicated a Firm Pumping Capacity of 250 GPM / 0.36 MGD. The lift station is intended to serve for another five years when it will be abandoned. Sizing analysis is limited to Southfork LS.
- Sundown Ranch LS will be sized to convey flows based on the 2024 Kimley Horn Condition Assessment Reports. The ultimate sizing will be based on the Firm Pumping Capacity listed in the assessment report, 566 GPM / 0.82 MGD. LAN will identify scope impacts of designing to current needs based on the existing flows of the Sundown Ranch LS.
- Bent Oaks LS will be sized to convey flows based on the 2024 Kimley Horn Condition Assessment Reports. The ultimate sizing will be based on the Firm Pumping Capacity listed in the assessment report, 154 GPM / 0.22 MGD. LAN will identify scope impacts of designing to current needs based on the existing flows of the Bent Oaks LS.
- Vacation Village LS will be sized to convey flows based on the 2024 Kimley Horn Condition Assessment Reports. The ultimate sizing will be based on the Firm Pumping Capacity listed in the assessment report, 234 GPM / 0.34 MGD. LAN will identify scope impacts of designing to current needs based on the existing flows of the Vacation Village LS.

LAN is committed to utilizing qualified sub-consultants as required to accomplish the proposed design project. Once formally authorized by the City, the LAN anticipates contracting with sub-consultants, as required, to perform recommended additional services outlined herein, including topographic survey, a geotechnical site investigation, and subsurface utility engineering (SUE). Basic services to be completed for each project phase are outlined below.

BASIC SERVICES TASKS

Task 1.0 – Preliminary Design Services:
LAN's preliminary design efforts shall include the following activities and is based on the assumptions as stated, where applicable:

Task 1.1 Document Review: Review LS historical documents, property documents and other available documents to identify existing conditions, property status, and current/projected flows for the LS. Obtain and review operational data from the city.

Task 1.2 Kick-off Meeting: Attend a project kick-off meeting with the City. Review findings and recommendations of aforementioned documentation, and discuss key design decisions, desired operational features, any additional items to be examined and/or considered as part of the LS project and obtain guidance to develop the project basis of design.

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Task 1.3 Design Concept Review:

1. Conduct an internal design concept review (DCR) meeting that allows senior technical staff to share ideas to meet/exceed project objectives, verify fulfillment of project requirements and mitigate potential project risks.
2. Facilitate a design concept review meeting with the City to discuss information identified during the internal DCR and solicit the City's input to guide the project direction.

Task 1.4 Basis of Design: Prepare the project Basis of Design using the information and input identified during Tasks 1 – 3. The Basis of Design will identify the required design parameters and will be provided to the City for review and concurrence. It will include the following:

- Site access
- Lift station type (submersible)
- Variable frequency drives (VFD's)
- Odor control (optional)
- Total pumping capacity and pump selection
- Recommended type of construction
- Acceptable pump manufacturers
- Power and service requirements
- Emergency generator requirements
- SCADA
- Bypass pumping requirements

Task 1.5 Risk Assessment: Perform a project risk assessment to identify potential risks (including schedule delays) and develop mitigation strategies to address the risks.

Task 1.6 Risk Assessment Workshop (Optional): Conduct a risk assessment workshop with the City to ensure appropriate risks are included and mitigation strategies are consistent with the City's desires.

Task 1.7 Lift Station Sizing Evaluation (for Southfork LS only): Review historical data provided by the City of influent flows to the lift station. Evaluate flowrates relative to rain events to differentiate dry weather and wet weather impacts on the lift station sizing.

Task 1.8 Design Alternatives: Develop design alternatives to accomplish the project objectives/requirements and that incorporate the identified risk mitigation strategies.

Task 1.9 Design Alternatives Meeting: Meet with the City to present the design alternatives, receive City input, identify City preferences, and verify alternatives that will be further evaluated.

Task 1.10 Draft Technical Memorandum: Prepare Draft Technical Memorandum (TM) that includes the following:

- Existing site description, property boundaries, easements, gravity sewers, and force main locations.
- General site location map, identifying property, nearby roadways, developments, schools, and/or parks.
- Existing site plan showing the location of facilities, infrastructure, roads, fencing, etc.
- Description of potential improvement alternatives and sizing
- Description of the basis of design for proposed improvements

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- Preliminary design drawings and exhibits of proposed improvements.
- Preliminary opinion of probable construction cost (OPCC) for recommended alternative.

Task 1.11 Quality Control (QC): Conduct internal Quality Control (QC) Draft PER review document prior to submission to City.

Task 1.12 Draft PER Submittal: Submit Draft TM to City (electronic copy).

Task 1.13 Draft PER Review Meeting: Meet with City following completion/submittal of Draft PER review to document City comments and discuss/resolve any outstanding questions/issues.

Task 1.14 Draft PER Revision: Revise Draft TM document, as required, based on City's review comments and/or review meeting discussions.

Task 1.15 Final PER Submittal: Submit Final TM to City (one electronic copy).

Task 2.0 – Prepurchase Package(s):

Task 2.1 Technical Specifications: Prepare applicable technical specifications (Divisions 1 - 46) and technical data sheets (Division 11 only) using LAN-standard technical specification documents needed for prepurchase of selected equipment.

Task 2.2 Front End Specifications: Prepare contract documents (Division 0, including Bid Form) using City-provided standard contract documentation. **NOTE**: City to provide Division 0 Specifications related to the bidding for revisions in coordination with Legal.

Task 2.3 Quality Control: Conduct internal Quality Control (QC) review of all prepurchase package submittal documentation prior to submission to City.

Task 3.0 – Final Design Services:

LAN's final design efforts shall include the following activities and is based on the assumptions as stated, where applicable:

Task 3.1 Final Design Kick-off Meeting: Attend final design kick-off meeting with City.

Task 3.2 Detailed Engineering Design: Complete detailed engineering design, including work associated with all general, civil, process/mechanical, structural, electrical, instrumentation, and control components, based on recommendations documented in Final PER prepared by LAN and approved by City under Task 1.0 and 2.0.

Task 3.3 Construction Drawings: Prepare applicable construction drawings, including drawings, sections, and details, for all design disciplines using electronic (CAD) software.

Task 3.4 Technical Specifications: Prepare applicable technical specifications (Divisions 1 - 46) and technical data sheets (Division 40, 41, 43 and 46 only, as applicable) using LAN-standard technical specification documents for all design disciplines (see Task 3.8 Interim Design Submittals).

Task 3.5 Front End Specifications: Prepare contract documents (Division 0, including Bid Form) using City-provided standard contract documentation. **NOTE**: City to provide Division 0 Specifications related to the bidding for revisions in coordination with Legal.

Task 3.6 Opinion of Probable Construction Cost: Prepare opinion of probable construction cost (OPCC) for all design disciplines.

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Task 3.7 Quality Control: Conduct internal Quality Control (QC) review of all interim design submittal documentation (60%, 90%, 100% and bid-ready) prior to submission to City.

Task 3.8 Interim Design Submittals: Submit interim design documentation, identified below, for City review and comment at the following milestones:

- 60% - preliminary construction drawings for all disciplines, technical specification table of contents, and OPCC (provide electronic copy of drawing sets, specification list, and the OPCC).
- 90% - construction drawings, technical specifications, for all disciplines, preliminary front end specifications, OPCC (provide electronic copy drawing sets, the specifications, and the OPCC).
- 100% - construction drawings, the technical specifications, preliminary front end specifications, the OPCC (provide electronic copy of drawing sets, the specifications, the OPCC).

Task 3.9 Cross-discipline Review: Complete cross-discipline drawing and technical specification reviews to verify project coordination and constructability at 60%, 90% and 100% submittals.

Task 3.10 Design Review Workshop: Conduct a design review workshop with City after the City's initial review of the 60% design submittal. The City will be provided the submittal documents one week before the workshop and comments are to be finalized one week after the workshop.

Task 3.11 Final Design Submittal (100%): Prepare and submit final construction drawings and specifications, after incorporating all applicable 90% design submittal City and QC review comments, to facilitate project advertisement and bidding.

Task 3.12: Prepare and submit to TCEQ "Project Summary Letter" for proposed lift station improvements design, in accordance with TCEQ Chapter 217 criteria (§217.9).

Task 4.0 – Bid Phase Services:

LAN's bid phase support services shall include the following activities and is based on the assumptions as stated, where applicable:

Task 4.1 Bid-ready Submittal: Produce electronic (PDF) "Issued for Bid" construction documents (single file) to facilitate City solicitation of bids for construction of the LS project (assume that City will be responsible for project advertisement, all hard copy drawings and specifications, "Issued for Bid" document distribution to prospective bidders and/or other plan holders, including plan rooms, and for maintaining current plan holder list).

Task 4.2 Pre-bid Meeting: Attend and participate in pre-bid meeting with City and prospective bidders (assume City will be responsible for documenting and distributing pre-bid meeting attendance list to all plan holders).

Task 4.3 Bid Questions/Addendum: Review questions submitted by prospective bidders and develop addenda documentation, including responses, clarifications and/or modifications to the construction drawings and/or technical specifications, as deemed necessary to address questions, prior to question submittal deadline (assumes City will be responsible for distribution of all addenda documentation in electronic (PDF) format to all plan holders).

Task 4.4 Bid Opening: Attend bid opening.

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Task 4.5 Bid Review and Tabulation: Review bids, prepare bid tabulation, evaluate the qualifications of the apparent successful bidder, and provide formalized award recommendation letter to City.

Task 5.0 – Construction Phase Services:

LAN's construction efforts shall include the following activities and is based on the assumptions as stated, where applicable, and does not include construction administration or inspection:

Task 5.1 Construction Documents: Prepare conformed "Issued for Construction" documents that incorporate all addenda and executed contract documents and submit to successful general contractor to facilitate project construction (provide two full-size set of construction drawings and two project manuals and one electronic copy of each). LAN will coordinate with the Contractor and obtain City signatures for the construction documents.

Task 5.2 Pre-construction Meeting: Prepare the pre-construction meeting agenda and conduct this meeting that will include City staff and the general contractor.

Task 5.3 Submittals: Review general contractor submittals delivered to LAN for compliance and conformance with the contract documents (assume review of a maximum of 30 submittals, including re-submittal documents). Post formal written review responses in PDF format via designated project on-line site. Maintain submittal log, including current record of the submittals delivered and the status of the review of those submittals.

Task 5.4 Requests for Information: Review general contractor requests for information (RFI) (assume review of a maximum of 15 RFIs). Examine and evaluate the RFI issue(s) and prepare a response that provides contract document interpretation. Inform City of RFI, the LAN's response and recommended general contractor action, if applicable. Post formal RFI responses in PDF format via designated project on-line site. Maintain RFI log, including current record of the RFIs received and the status of the response to those RFI.

Task 5.5 Change Order Requests: Review general contractor change order requests (assume review of a maximum of five change orders). Examine and evaluate the proposed change order item(s) and costs and prepare a response that provides contract document interpretation and comments on the cost items. Inform City of change order request, LAN's proposed response, including recommended change order acceptance or rejection (assumes City is responsible for formally processing all accepted change orders). Post formal change order responses in PDF format via designated project on-line site. Maintain change order log, including current record of the change orders received, their status and cost of all accepted change orders.

Task 5.6 Contractor Payment Applications: Review monthly general contractor payment applications following review by City's designated onsite representative responsible for day-to-day construction observation. Provide comments, if applicable, and/or recommendation of payment by City for items completed (assume City will be responsible for formally processing all approved applications for payment).

Task 5.7 Construction Progress Meetings: Attend monthly construction progress meetings (assume a maximum of 12 construction progress meetings with a maximum of two LAN representatives attending).

Task 5.8 Lift Station Startup: Assist City plant operations staff in lift station startup (assumes attendance by two LAN representatives).

Task 5.9 Substantial Completion Walk-through: Attend substantial completion walk-through with City and general contractor.

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Task 5.10 Substantial Completion Punchlist: Prepare comprehensive action items punch list based on issues identified during the substantial completion walk-through to be completed by the general contractor. Distribute PDF punch list to City and general contractor.

Task 5.11 Final Completion Walk-through: Attend final completion walk-through and verify all punch list items have been addressed by construction contractor (assumes attendance by maximum of two LAN representatives).

Task 5.12 Record Drawings: Prepare record drawings using electronic redline drawings provided by the general contractor on a monthly basis. Submit record drawings to City (provide one full-size drawing set and electronic (PDF) file of all drawings).

Task 5.13 TCEQ Completion Notification: Prepare and submit project "Completion Notification" to TCEQ in accordance with prevailing Chapter 217 criteria (§217.13).

Task 6.0 – Project Management Services:

LAN's project management efforts shall include the following activities and is based on the assumptions as stated, where applicable:

Task 6.1 Work Plan: Develop a project specific work plan that includes objectives, delivery requirements, key decision points, budget, and schedule to guide project production efforts.

Task 6.2 Project Status Reports: Provide City with monthly project status reports (via email).

Task 6.3 Project Design Meetings/Workshops: Schedule all required meetings with City, develop meeting agendas, attend and guide meeting discussions, prepare meeting summaries, and distribute electronic (PDF) summaries to all parties in attendance.

Task 6.4 City Review Comments: Document City review comments received for Draft PER, 60%, and 90% submittals and LAN's responses or action for each comment.

Task 6.5 Quality Assurance: Perform deliverable document checks (PER, 60%, 90%, 100%, and bid-ready) to confirm City review comments and/or requested action items have been addressed.

RECOMMENDED ADDITIONAL SERVICES

Topographic Surveying:

If the City is unable to provide surveying services, LAN proposes to contract with a qualified sub-consultant to perform the professional surveying services necessary to facilitate the design of the proposed lift station improvements. Anticipated information to be collected includes existing ground elevations, existing utility locations, etc.

Note: Fee proposal value represents estimated allowance for completion of surveying services; actual fee will be negotiated and performed on a lump sum basis.

Geotechnical Site Investigation:

LAN proposes to contract with a qualified sub-consultant to perform the professional geotechnical sub-consultant to provide lift station construction recommendations to facilitate the proposed lift station improvement design and installation. The geotechnical report will include a description of existing soil conditions and recommendations related to structural design, including foundation design, and lift station installation.

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Note: No fee proposal has been provided as an allowance for completion of SUE as it is not anticipated; actual fee will be negotiated and performed on a lump sum basis if it becomes necessary.

Subsurface Utility Engineering:
If necessary, LAN proposes to contract with a qualified sub-consultant to perform the subsurface utility engineering (SUE) to identify subsurface utility information to facilitate the design of the proposed lift station improvements and the gravity sewers and force mains on the site as identified and approved by the City.

Note: No fee proposal has been provided as an allowance for completion of SUE as it is not anticipated; actual fee will be negotiated and performed on a lump sum basis if it becomes necessary.

REIMBURSABLE EXPENSES

LAN shall seek City reimbursement for the project-related expenses outlined herein.

- Mileage
- Reproduction
- Shipping

ITEMS NOT INCLUDED IN SCOPE OF WORK

LAN shall consider the following items to be outside of the scope of work for the basic services tasks, as outlined herein, to be performed by the LAN in conjunction with the completion of the Project. LAN's completion of all or a portion of the services outlined below shall require detailed scope development, the provision of additional fee, and formal, written authorization by the City.

- Boundary survey and easement preparation
- Sewer shed modeling
- Flow monitoring
- Construction administration and inspection
- Environmental and/or archeological site investigation and/or permitting
- Remediation of any hazardous materials uncovered on the site
- Services for other agency or local permits not identified above (i.e., TxDOT, railroad, Americans with Disabilities Act (ADA), building permits, etc.)
- Payment of any application or permitting fees
- Field surveys including platting, boundary surveys, construction staking, etc.
- Hydrologic and/or floodplain studies related to the site
- Landscaping design
- Offsite utilities or infrastructure design, not identified in the contract scope
- Architectural design
- Performance of materials testing or specialty testing services
- Services related to development of City's project financing and/or budget
- Attendance at public meetings
- Services related to disputes over pre-qualification, bid protests, bid rejection, and re-bidding of the contract for construction
- Services necessary due to the default of the general contactor
- Services related to damages caused by fire, flood, earthquake, or other acts of God

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- Services related to warranty claims, enforcement, and inspection after final completion
- Services to support, prepare, document, bring, defend, or assist in litigation undertaken or defended by City
- Services related to any significant deviations and/or additions to anticipated detailed design scope (identified under Task 2.0)
- Services related to production, bidding, and construction administration of multiple design packages to accomplish project construction (in lieu of single construction package)
- Miscellaneous/supplemental services requested by City not specified herein.

(End Scope of Work)

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Attachment B

Southfork, Sundown Ranch, Bent Oaks, and Vacation Village Lift Stations Design
Summary of Fees

September 2025

Services to be performed under this Engineering Services Agreement shall be paid on a Lump Sum basis at the amounts shown below. For tasks without a listed budget, the scope of services listed in this agreement are not anticipated and excluded from the agreement for that location.

Task Description	Southfork LS Total	Sundown Ranch LS Total	Bent Oaks LS Total	Vacation Village LS Total	Total
1.0 Preliminary Design	$ 31,220	$ 40,060	$ 40,060	$ 40,060	$ 151,400
2.0 Prepurchase Packages	$ -	$ 8,910	$ 8,910	$ 8,910	$ 26,730
3.0 Final Design	$ 26,570	$ 91,260	$ 91,260	$ 91,260	$ 300,350
4.0 Bidding Services	$ 4,740	$ 11,250	$ 11,250	$ 11,250	$ 38,490
5.0 Construction Phase Services	$ 14,080	$ 41,470	$ 41,470	$ 41,470	$ 138,490
6.0 Project Management Services	$ 7,640	$ 14,240	$ 14,240	$ 14,240	$ 50,360
	$ 84,250	**$ 207,190**	**$ 207,190**	**$ 207,190**	**$ 705,820**
7.0 Topographic Survey	$ -	$ 9,900	$ 9,900	$ 9,900	$ 29,700
8.0 Geotechnical Report	$ -	$ -	$ -	$ -	$ -
9.0 Subsurface Utility Engineering	$ -	$ -	$ -	$ -	$ -
	$ -	**$ 9,900**	**$ 9,900**	**$ 9,900**	**$ 29,700**
	$ 84,250	**$ 217,090**	**$ 217,090**	**$ 217,090**	**$ 735,520**

(End Summary of Fees)

CONFLICT OF INTEREST QUESTIONNAIRE - FORM CIQ

For vendor or other person doing business with local governmental entity

This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code, by a vendor who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the vendor meets requirements under Section 176.006(a) and by City of Denton Ethics Code, Ordinance 18-757.
By law this questionnaire must be filed with the records administrator of the local government entity not later than the 7th business day after the date the vendor becomes aware of facts that require the statement to be filed. *See* Section 176.006(a-1), Local Government Code.

A vendor commits an offense if the vendor knowingly violates Section 176.006, Local Government Code. An offense under this section is a misdemeanor.

1 **Name of vendor who has a business relationship with local governmental entity.**

Lockwood, Andrews & Newnam, Inc.

2 [X] **Check this box if you are filing an update to a previously filed questionnaire.**

(The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date on which you became aware that the originally filed questionnaire was incomplete or inaccurate.)

3 **Name of local government officer about whom the information in this section is being disclosed.**

_____
Name of Officer

Describe each employment or other business relationship with the local government officer, or a family member of the officer, as described by Section 176.003(a)(2)(A). Also describe any family relations hip with the local government officer. This section, (item 3 including subparts A, B, C & D), must be completed for each officer with whom the vendor has an employment or other business relationship as defined by Section 176.001(1-a), Local Government Code. Attach additional pages to this Form CIQ as necessary.

A. Is the local government officer named in this section receiving or likely to receive taxable income, other than investment income, from the vendor?

[ ] Yes [X] No

B. Is the vendor receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer named in this section AND the taxable income is not received from the local governmental entity?

[ ] Yes [X] No

C. Is the filer of this questionnaire employed by a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership of one percent or more?

[ ] Yes [X] No

D. Describe each employment or business and family relationship with the local government officer named in this section.

4 [X] **I have no Conflict of Interest to disclose.**

5 DocuSigned by: Justin Reeves 6CCE404BC62D4F6...

Signature of vendor doing business with the governmental entity

11/13/2025
Date

Docusign Envelope ID: FBE8D3F3-46E0-4CA2-9EB2-05C15EAEF70B

CONFLICT OF INTEREST QUESTIONNAIRE
For vendor doing business with local governmental entity

A complete copy of Chapter 176 of the Local Government Code may be found at http://www.statutes.legis.state.tx.us/ Docs/LG/htm/LG.176.htm. For easy reference, below are some of the sections cited on this form.

Local Government Code § 176.001(1-a): "Business relationship" means a connection between two or more parties based on commercial activity of one of the parties. The term does not include a connection based on:

(A) a transaction that is subject to rate or fee regulation by a federal, state, or local governmental entity or an agency of a federal, state, or local governmental entity;

(B) a transaction conducted at a price and subject to terms available to the public; or

(C) a purchase or lease of goods or services from a person that is chartered by a state or federal agency and that is subject to regular examination by, and reporting to, that agency.

Local Government Code § 176.003(a)(2)(A) and (B):

(A) A local government officer shall file a conflicts disclosure statement with respect to a vendor if:

(2) the vendor:

(A) has an employment or other business relationship with the local government officer or a family member of the officer that results in the officer or family member receiving taxable income, other than investment income, that exceeds $2,500 during the 12-month period preceding the date that the officer becomes aware that

(i) a contract between the local governmental entity and vendor has been executed; or

(ii) the local governmental entity is considering entering into a contract with the vendor;

(B) has given to the local government officer or a family member of the officer one or more gifts that have an aggregate value of more than $100 in the 12-month period preceding the date the officer becomes aware that:

(i) a contract between the local governmental entity and vendor has been executed; or

(ii) the local governmental entity is considering entering into a contract with the vendor.

Local Government Code § 176.006(a) and (a-1)

(a) A vendor shall file a completed conflict of interest questionnaire if the vendor has a business relationship with a local governmental entity and:

(1) has an employment or other business relationship with a local government officer of that local governmental entity, or a family member of the officer, described by Section 176.003(a)(2)(A);

(2) has given a local government officer of that local governmental entity, or a family member of the officer, one or more gifts with the aggregate value specified by Section 176.003(a)(2)(B), excluding any gift described by Section 176.003(a-1); or

(3) has a family relationship with a local government officer of that local governmental entity.

(a-1) The completed conflict of interest questionnaire must be filed with the appropriate records administrator not later than the seventh business day after the later of:

(1) the date that the vendor:

(A) begins discussions or negotiations to enter into a contract with the local governmental entity; or

(B) submits to the local governmental entity an application, response to a request for proposals or bids, correspondence, or another writing related to a potential contract with the local governmental entity; or

(2) the date the vendor becomes aware:

(A) of an employment or other business relationship with a local government officer, or a family member of the officer, described by Subsection (a);

(B) that the vendor has given one or more gifts described by Subsection (a); or

(C) of a family relationship with a local government officer.

City of Denton Ethics Code Ordinance Number 18-757

Definitions:

Relative: a family member related to a City Official within the third 3rd degree of affinity (marriage) or consanguinity (blood or adoption)

City Official: for purpose of this article, the term consists of the Council Members, Department Heads, or member of the Board of Ethics, Planning and zoning Commission Members, Board of Adjustment, Historic Landmark Commission, or Public Utilities Board

Vendor: a person who provides or seeks to provide goods, services, and/or real property to the City in exchange for compensation. This definition does not include those property owners from whom the City acquires public right-of-way or other real property interests for public use.

Per the City of Denton Ethics Code, Section 2-273. – Prohibitions

(3) It shall be a violation of this Article for a Vendor to offer or give a Gift to City Official exceeding fifty dollars ($50.00) per gift, or multiple gifts cumulatively valued at more than two hundred dollars ($200.00) per a single fiscal year.

Per the City of Denton Ethics Code, Section 2-282. – Disposition (b), (5) Ineligibility

If the Board of Ethics finds that a Vendor has violated this Article, the Board may recommend to the City Manager that the Vendor be deemed ineligible to enter into a City contract or other arrangement for goods, services, or real property, for a period of one (1) year.

Certificate Of Completion

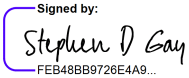
Envelope Id: FBE8D3F3-46E0-4CA2-9EB2-05C15EAEF70B
Status: Sent
Subject: Please DocuSign: City Council Contract 8213-011 Lift Station Rehabilitation Project
Source Envelope:
Document Pages: 30
Signatures: 4
Certificate Pages: 6
Initials: 1
AutoNav: Enabled
EnvelopeId Stamping: Enabled
Time Zone: (UTC-06:00) Central Time (US & Canada)

Envelope Originator:
Gabby Leeper
901B Texas Street
Denton, TX 76209
Gabby.Leeper@cityofdenton.com
IP Address: 198.49.140.104

Record Tracking

Status: Original
11/10/2025 3:20:59 PM
Holder: Gabby Leeper
Gabby.Leeper@cityofdenton.com
Location: DocuSign

Signer Events	Signature	Timestamp
Gabby Leeper Gabby.Leeper@cityofdenton.com Senior Buyer City of Denton Security Level: Email, Account Authentication (None)	**Completed** Using IP Address: 198.49.140.104	Sent: 11/10/2025 3:21:41 PM Viewed: 11/10/2025 3:22:13 PM Signed: 11/10/2025 3:22:28 PM
Electronic Record and Signature Disclosure: Not Offered via Docusign		
Lori Hewell lori.hewell@cityofdenton.com Purchasing Manager City of Denton Security Level: Email, Account Authentication (None)	DS LH Signature Adoption: Pre-selected Style Using IP Address: 198.49.140.10	Sent: 11/10/2025 3:22:30 PM Viewed: 11/10/2025 3:39:26 PM Signed: 11/10/2025 3:39:44 PM
Electronic Record and Signature Disclosure: Not Offered via Docusign		
Leah Bush leah.bush@cityofdenton.com Security Level: Email, Account Authentication (None)	Signed by: Leah Bush 2A936B08B5D7485... Signature Adoption: Pre-selected Style Using IP Address: 198.49.140.10	Sent: 11/10/2025 3:47:40 PM Viewed: 11/12/2025 9:03:17 AM Signed: 11/12/2025 9:24:28 AM
Electronic Record and Signature Disclosure: Accepted: 11/12/2025 9:03:17 AM ID: 29e10c25-9333-4d14-a425-51bd323167b2		
Justin Reeves JReeves@lan-inc.com Vice President Security Level: Email, Account Authentication (None)	DocuSigned by: Justin Reeves 6CCE404BC62D4F6... Signature Adoption: Pre-selected Style Using IP Address: 170.85.102.102	Sent: 11/12/2025 9:24:31 AM Resent: 11/13/2025 7:58:00 AM Viewed: 11/13/2025 9:05:09 PM Signed: 11/13/2025 9:06:58 PM
Electronic Record and Signature Disclosure: Accepted: 11/13/2025 9:05:09 PM ID: 492e7b9d-6a1d-40d5-9e1e-9160ebc3f004		

Signer Events	Signature	Timestamp
Stephen D Gay Stephen.Gay@cityofdenton.com General Manager Water Utilities Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Accepted: 11/20/2025 1:50:17 PM ID: 649337fd-e6bc-43ca-9a1d-bf3759be8fbf	Signed by:  FEB48BB9726E4A9... Signature Adoption: Pre-selected Style Using IP Address: 198.49.140.10	Sent: 11/13/2025 9:07:01 PM Resent: 11/17/2025 9:09:51 AM Resent: 11/20/2025 10:33:33 AM Viewed: 11/20/2025 1:50:17 PM Signed: 11/20/2025 2:07:38 PM
Cheyenne Defee cheyenne.defee@cityofdenton.com Procurement Administration Supervisor City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign		Sent: 11/20/2025 2:07:46 PM
Sara Hensley sara.hensley@cityofdenton.com Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign		
Ingrid Rex ingrid.rex@cityofdenton.com Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign		

In Person Signer Events	Signature	Timestamp

Editor Delivery Events	Status	Timestamp

Agent Delivery Events	Status	Timestamp

Intermediary Delivery Events	Status	Timestamp

Certified Delivery Events	Status	Timestamp

Carbon Copy Events	Status	Timestamp
Cheyenne Defee cheyenne.defee@cityofdenton.com Procurement Administration Supervisor City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign	COPIED	Sent: 11/10/2025 3:22:30 PM
Marcella Lunn marcella.lunn@cityofdenton.com Senior Deputy City Attorney City of Denton Security Level: Email, Account Authentication (None)	COPIED	Sent: 11/10/2025 3:47:42 PM

Carbon Copy Events	Status	Timestamp
Electronic Record and Signature Disclosure: Not Offered via Docusign		
Gretna Jones gretna.jones@cityofdenton.com Legal Secretary City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign	COPIED	Sent: 11/20/2025 2:07:46 PM Viewed: 11/21/2025 4:43:42 PM
City Secretary Office citysecretary@cityofdenton.com Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign		

Witness Events	Signature	Timestamp

Notary Events	Signature	Timestamp

Envelope Summary Events	Status	Timestamps
Envelope Sent	Hashed/Encrypted	11/10/2025 3:21:42 PM
Envelope Updated	Security Checked	11/17/2025 8:17:42 AM

Payment Events	Status	Timestamps

Electronic Record and Signature Disclosure

ELECTRONIC RECORD AND SIGNATURE DISCLOSURE

From time to time, City of Denton (we, us or Company) may be required by law to provide to you certain written notices or disclosures. Described below are the terms and conditions for providing to you such notices and disclosures electronically through your DocuSign, Inc. (DocuSign) Express user account. Please read the information below carefully and thoroughly, and if you can access this information electronically to your satisfaction and agree to these terms and conditions, please confirm your agreement by clicking the 'I agree' button at the bottom of this document.

Getting paper copies

At any time, you may request from us a paper copy of any record provided or made available electronically to you by us. For such copies, as long as you are an authorized user of the DocuSign system you will have the ability to download and print any documents we send to you through your DocuSign user account for a limited period of time (usually 30 days) after such documents are first sent to you. After such time, if you wish for us to send you paper copies of any such documents from our office to you, you will be charged a $0.00 per-page fee. You may request delivery of such paper copies from us by following the procedure described below.

Withdrawing your consent

If you decide to receive notices and disclosures from us electronically, you may at any time change your mind and tell us that thereafter you want to receive required notices and disclosures only in paper format. How you must inform us of your decision to receive future notices and disclosure in paper format and withdraw your consent to receive notices and disclosures electronically is described below.

Consequences of changing your mind

If you elect to receive required notices and disclosures only in paper format, it will slow the speed at which we can complete certain steps in transactions with you and delivering services to you because we will need first to send the required notices or disclosures to you in paper format, and then wait until we receive back from you your acknowledgment of your receipt of such paper notices or disclosures. To indicate to us that you are changing your mind, you must withdraw your consent using the DocuSign 'Withdraw Consent' form on the signing page of your DocuSign account. This will indicate to us that you have withdrawn your consent to receive required notices and disclosures electronically from us and you will no longer be able to use your DocuSign Express user account to receive required notices and consents electronically from us or to sign electronically documents from us.

All notices and disclosures will be sent to you electronically

Unless you tell us otherwise in accordance with the procedures described herein, we will provide electronically to you through your DocuSign user account all required notices, disclosures, authorizations, acknowledgements, and other documents that are required to be provided or made available to you during the course of our relationship with you. To reduce the chance of you inadvertently not receiving any notice or disclosure, we prefer to provide all of the required notices and disclosures to you by the same method and to the same address that you have given us. Thus, you can receive all the disclosures and notices electronically or in paper format through the paper mail delivery system. If you do not agree with this process, please let us know as described below. Please also see the paragraph immediately above that describes the consequences of your electing not to receive delivery of the notices and disclosures electronically from us.

How to contact City of Denton:
You may contact us to let us know of your changes as to how we may contact you electronically, to request paper copies of certain information from us, and to withdraw your prior consent to receive notices and disclosures electronically as follows:
To contact us by email send messages to: purchasing@cityofdenton.com

To advise City of Denton of your new e-mail address
To let us know of a change in your e-mail address where we should send notices and disclosures electronically to you, you must send an email message to us at melissa.kraft@cityofdenton.com and in the body of such request you must state: your previous e-mail address, your new e-mail address. We do not require any other information from you to change your email address..
In addition, you must notify DocuSign, Inc to arrange for your new email address to be reflected in your DocuSign account by following the process for changing e-mail in DocuSign.

To request paper copies from City of Denton
To request delivery from us of paper copies of the notices and disclosures previously provided by us to you electronically, you must send us an e-mail to purchasing@cityofdenton.com and in the body of such request you must state your e-mail address, full name, US Postal address, and telephone number. We will bill you for any fees at that time, if any.

To withdraw your consent with City of Denton
To inform us that you no longer want to receive future notices and disclosures in electronic format you may:

i. decline to sign a document from within your DocuSign account, and on the subsequent page, select the check-box indicating you wish to withdraw your consent, or you may;
ii. send us an e-mail to purchasing@cityofdenton.com and in the body of such request you must state your e-mail, full name, IS Postal Address, telephone number, and account number. We do not need any other information from you to withdraw consent.. The consequences of your withdrawing consent for online documents will be that transactions may take a longer time to process..

Required hardware and software

Operating Systems:	Windows2000? or WindowsXP?
Browsers (for SENDERS):	Internet Explorer 6.0? or above
Browsers (for SIGNERS):	Internet Explorer 6.0?, Mozilla FireFox 1.0, NetScape 7.2 (or above)
Email:	Access to a valid email account
Screen Resolution:	800 x 600 minimum
Enabled Security Settings:	•Allow per session cookies •Users accessing the internet behind a Proxy Server must enable HTTP 1.1 settings via proxy connection

** These minimum requirements are subject to change. If these requirements change, we will provide you with an email message at the email address we have on file for you at that time providing you with the revised hardware and software requirements, at which time you will have the right to withdraw your consent.

Acknowledging your access and consent to receive materials electronically
To confirm to us that you can access this information electronically, which will be similar to other electronic notices and disclosures that we will provide to you, please verify that you were able to read this electronic disclosure and that you also were able to print on paper or electronically save this page for your future reference and access or that you were able to e-mail this disclosure and consent to an address where you will be able to print on paper or save it for your future reference and access. Further, if you consent to receiving notices and disclosures exclusively in electronic format on the terms and conditions described above, please let us know by clicking the 'I agree' button below.
By checking the 'I Agree' box, I confirm that:

- I can access and read this Electronic CONSENT TO ELECTRONIC RECEIPT OF ELECTRONIC RECORD AND SIGNATURE DISCLOSURES document; and

- I can print on paper the disclosure or save or send the disclosure to a place where I can print it, for future reference and access; and

- Until or unless I notify City of Denton as described above, I consent to receive from exclusively through electronic means all notices, disclosures, authorizations, acknowledgements, and other documents that are required to be provided or made available to me by City of Denton during the course of my relationship with you.

City of Denton

City Hall
215 E. McKinney Street
Denton, Texas
www.cityofdenton.com

AGENDA INFORMATION SHEET

DEPARTMENT: Procurement

ACM: Christine Taylor

DATE: December 15, 2025

SUBJECT

Consider recommending adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute a Professional Services Agreement with WM. M. Coleman & Associates, Inc. dba Coleman & Assoc. Land Surveying, for construction inspection services of the construction of Landfill Cell 6 for the Solid Waste and Recycling Department as set forth in the contract; providing for the expenditure of funds therefor; and providing an effective date (RFQ 8525-012 – Professional Services Agreement for construction inspection services awarded to WM. M. Coleman & Associates, Inc. dba Coleman & Assoc. Land Surveying, in the not-to-exceed amount of $156,265.00).

STRATEGIC ALIGNMENT

This action supports Key Focus Area: Promote Sustainability and the Environment.

INFORMATION/BACKGROUND

Coleman & Assoc. Land Surveying has submitted a proposal to provide professional services related to the construction inspection during the construction of Landfill Cell 6, as listed below.

1. Pre-Construction Topographic Data
2. QC/QA Survey Cell 6 Liner Report Sub-Grade (Verify Construction)
3. QC/QA Survey Cell 6 Report Top of Clay Liner, Soil Liner Evaluation Report (SLER)
4. QC/QA Survey Cell 6 Liner Report Protective Cover Geomembrane/Geo-composite (GLER/FMLER)
5. Topographic Survey Cell 6 Final Soil
6. QC/QA Survey Additional Drainage Features

A landfill must have an approved Soils and Liner Quality Control Plan (SLQCP) prepared under the direction of a registered professional engineer. The department has a professional service agreement with Parkhill to provide cell design and construction management services. The Coleman & Assoc. Land Surveying service agreement includes quality control testing and performance data collections during cell construction, which is reported to the Texas Commission of Environmental Quality (TCEQ) in the Soil and Liner Evaluation Report (SLER), Geomembrane Liner Evaluation Report (GLER), and the Flexible Membrane Liner Evaluation Report (FMLER). The SLQCP includes the constructed liner details, the soil and liner quality control testing procedures, and data.

Coleman & Assoc. Land Surveying will provide on-site surveying and observation during all liner construction and geomembrane placement required by the Texas Commission on Environmental Quality (TCEQ) to meet the SLQCP. The professional services to be provided, the associated costs of the construction inspection, and the specific testing required are detailed in the proposal received from Coleman & Assoc. Land Surveying.

Coleman & Assoc. Land Surveying will work closely with Parkhill during the construction process to ensure all construction and surveying requirements are performed in accordance with the regulatory requirements of the State of Texas, and that all reporting is timely and accurate.

City staff recommends the Denton firm of Coleman & Assoc. Land Surveying to provide the professional services as described in their proposal. They provided similar services in 2021 during the construction of Cell 4 B, C, and D. They possess the needed professional surveying expertise and can provide the Solid Waste Department with the professional services to meet regulatory requirements.

Request for Qualifications for professional services was solicited using the City's formal solicitation process. City Council approved a pre-qualified list of engineering firms on August 20, 2024 (Ordinance 24-1562).

PRIOR ACTION/REVIEW (COUNCIL, BOARDS, COMMISSIONS)

On August 20, 2024, City Council approved RFQ 8525 for state certified engineers for professional engineering services for the Solid Waste and Recycling Department (Ordinance 24-1562).

RECOMMENDATION

Award a contract with WM. M. Coleman & Associates, Inc. dba Coleman & Assoc. Land Surveying, for construction inspection services of the construction of Landfill Cell 6 for the Solid Waste and Recycling Department, in a not-to-exceed amount of $156,265.

PRINCIPAL PLACE OF BUSINESS

WM. M. Coleman & Associates, Inc. dba Coleman & Assoc. Land Surveying
Denton, TX

FISCAL INFORMATION

These services will be funded from Cell 5 & 6 Construction account 660270585.1360.47710. Requisition #172114 has been entered into the Purchasing software system in the amount of $156,265. The budgeted amount of this item is $156,265.

EXHIBITS

Exhibit 1: Agenda Information Sheet
Exhibit 2: Ordinance and Contract

Respectfully submitted:
Lori Hewell, 940-349-7100
Purchasing Manager

For information concerning this acquisition, contact: Randall Morris, 940-349-8049.

Legal point of contact: Marcella Lunn at 940-349-8333.

ORDINANCE NO. _____

AN ORDINANCE OF THE CITY OF DENTON, A TEXAS HOME-RULE MUNICIPAL CORPORATION, AUTHORIZING THE CITY MANAGER TO EXECUTE A PROFESSIONAL SERVICES AGREEMENT WITH WM. M. COLEMAN & ASSOCIATES, INC. DBA COLEMAN & ASSOC. LAND SURVEYING, FOR CONSTRUCTION INSPECTION SERVICES OF THE CONSTRUCTION OF LANDFILL CELL 6 FOR THE SOLID WASTE AND RECYCLING DEPARTMENT AS SET FORTH IN THE CONTRACT; PROVIDING FOR THE EXPENDITURE OF FUNDS THEREFOR; AND PROVIDING AN EFFECTIVE DATE (RFQ 8525-012 – PROFESSIONAL SERVICES AGREEMENT FOR CONSTRUCTION INSPECTION SERVICES AWARDED TO WM. M. COLEMAN & ASSOCIATES, INC. DBA COLEMAN & ASSOC. LAND SURVEYING, IN THE NOT-TO-EXCEED AMOUNT OF $156,265.00).

WHEREAS, on August 20, 2024, the City Council approved a pre-qualified professional services list of state certified engineers for professional engineering services for the Solid Waste and Recycling Department (Ordinance 24-1562), and the professional services provider (the "Provider") mentioned in this ordinance is being selected as the most highly qualified on the basis of its demonstrated competence and qualifications to perform the proposed professional services; and

WHEREAS, this procurement was undertaken as part of the City's governmental function [Engineering functions]; and

WHEREAS, the fees under the proposed contract are fair and reasonable and are consistent with, and not higher than, the recommended practices and fees published by the professional associations applicable to the Provider's profession, and such fees do not exceed the maximum provided by law; NOW, THEREFORE,

THE COUNCIL OF THE CITY OF DENTON HEREBY ORDAINS:

SECTION 1. The City Manager, or their designee, is hereby authorized to enter into an agreement with WM. M. Coleman & Associates, Inc. dba Coleman & Assoc. Land Surveying, to provide professional engineering services for the City of Denton, a copy of which is attached hereto and incorporated by reference herein.

SECTION 2. The City Manager, or their designee, is authorized to expend funds as required by the attached contract.

SECTION 3. The City Council of the City of Denton hereby expressly delegates the authority to take any actions that may be required or permitted to be performed by the City of Denton under this ordinance to the City Manager of the City of Denton, or their designee.

SECTION 4. The findings in the preamble of this ordinance are incorporated herein by reference.

SECTION 5. This ordinance shall become effective immediately upon its passage and approval.

The motion to approve this ordinance was made by _____ and seconded by _____. This ordinance was passed and approved by the following vote [___ - ___]:

	Aye	**Nay**	**Abstain**	**Absent**
Mayor Gerard Hudspeth:	_____	_____	_____	_____
Vicki Byrd, District 1:	_____	_____	_____	_____
Brian Beck, District 2:	_____	_____	_____	_____
Suzi Rumohr, District 3:	_____	_____	_____	_____
Joe Holland, District 4:	_____	_____	_____	_____
Brandon Chase McGee, At Large Place 5:	_____	_____	_____	_____
Jill Jester, At Large Place 6:	_____	_____	_____	_____

PASSED AND APPROVED this the _____ day of _____, 2025.

_____
GERARD HUDSPETH, MAYOR

ATTEST:
INGRID REX, CITY SECRETARY

BY: _____

APPROVED AS TO LEGAL FORM:
MACK REINWAND, CITY ATTORNEY

BY: Leah Bush

Docusign Envelope ID: 6E135FBB-0C86-45CA-B556-D781C4FDB21A

Docusign City Council Transmittal Coversheet

PSA	8525-012
File Name	CELL 6 SURVEYING SERVICES
Purchasing Contact	Crystal Westbrook
City Council Target Date	
Piggy Back Option	Not Applicable
Contract Expiration	
Ordinance	

DS
LH

Docusign Envelope ID: 6E135FBB-0C86-45CA-B556-D781C4FDB21A

CITY OF DENTON, TEXAS

STANDARD AGREEMENT FOR ENGINEERING RELATED PROFESSIONAL SERVICES

This AGREEMENT is between the City of Denton, a Texas home-rule municipality ("CITY"), and Coleman & Assoc. Land Surveying, with its corporate office at PO BOX 686, Denton, TX 76202 and authorized to do business in Texas, ("ENGINEER"), for a PROJECT generally described as: Cell 6 Surveying Services (the "PROJECT").

SECTION 1
Scope of Services

A. The CITY hereby agrees to retain the ENGINEER, and the ENGINEER hereby agrees to perform, professional engineering services set forth in the Scope of Services attached hereto as Attachment A. These services shall be performed in connection with the PROJECT.

B. Additional services, if any, will be requested in writing by the CITY. CITY shall not pay for any work performed by ENGINEER or its consultants, subcontractors and/or suppliers that has not been ordered in advance and in writing. It is specifically agreed that ENGINEER shall not be compensated for any additional work resulting from oral orders of any person.

SECTION 2
Compensation and Term of Agreement

A. The ENGINEER shall be compensated for all services provided pursuant to this AGREEMENT in an amount not to exceed $156,265 in the manner and in accordance with the fee schedule as set forth in Attachment A. Payment shall be considered full compensation for all labor, materials, supplies, and equipment necessary to complete the services described in Attachment A.

B. Unless otherwise terminated pursuant to Section 6. D. herein, this AGREEMENT shall be for a term beginning upon the effective date, as described below, and shall continue for a period which may reasonably be required for the completion of the PROJECT, until the expiration of the funds, or completion of the PROJECT and acceptance by the CITY, whichever occurs first. ENGINEER shall proceed diligently with the PROJECT to completion as described in the PROJECT schedule as set forth in Attachment A.

SECTION 3
Terms of Payment

Payments to the ENGINEER will be made as follows:

A. Invoice and Payment

Docusign Envelope ID: 6E135FBB-0C86-45CA-B556-D781C4FDB21A

(1) The Engineer shall provide the City sufficient documentation, including but not limited to meeting the requirements set forth in the PROJECT schedule as set forth in Attachment A to reasonably substantiate the invoices.

(2) The ENGINEER will issue monthly invoices for all work performed under this AGREEMENT. Invoices for the uncontested performance of the particular services are due and payable within 30 days of receipt by City.

(3) Upon completion of services enumerated in Section 1, the final payment of any balance for the uncontested performance of the services will be due within 30 days of receipt of the final invoice.

(4) In the event of a disputed or contested billing, only that portion so contested will be withheld from payment, and the undisputed portion will be paid. The CITY will exercise reasonableness in contesting any bill or portion thereof. No interest will accrue on any contested portion of the billing until mutually resolved.

(5) If the CITY fails to make payment in full to ENGINEER for billings contested in good faith within 60 days of the amount due, the ENGINEER may, after giving 7 days' written notice to CITY, suspend services under this AGREEMENT until paid in full. In the event of suspension of services, the ENGINEER shall have no liability to CITY for delays or damages caused the CITY because of such suspension of services.

SECTION 4
Obligations of the Engineer

A. General

The ENGINEER will serve as the CITY's professional engineering representative under this AGREEMENT, providing professional engineering consultation and advice and furnishing customary services incidental thereto.

B. Standard of Care

The ENGINEER shall perform its services:

(1) with the professional skill and care ordinarily provided by competent engineers practicing in the same or similar locality and under the same or similar circumstances and professional license; and

(2) as expeditiously as is prudent considering the ordinary professional skill and care of a competent engineer.

C. Subsurface Investigations

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(1) The ENGINEER shall advise the CITY with regard to the necessity for subcontract work such as special surveys, tests, test borings, or other subsurface investigations in connection with design and engineering work to be performed hereunder. The ENGINEER shall also advise the CITY concerning the results of same. Such surveys, tests, and investigations shall be furnished by the CITY, unless otherwise specified in Attachment A.

(2) In soils, foundation, groundwater, and other subsurface investigations, the actual characteristics may vary significantly between successive test points and sample intervals and at locations other than where observations, exploration, and investigations have been made. Because of the inherent uncertainties in subsurface evaluations, changed or unanticipated underground conditions may occur that could affect the total PROJECT cost and/or execution. These conditions and cost/execution effects are not the responsibility of the ENGINEER.

D. Preparation of Engineering Drawings

The ENGINEER will provide to the CITY the original drawings of all plans in ink on reproducible mylar sheets and electronic files in .pdf format, or as otherwise approved by CITY, which shall become the property of the CITY. CITY may use such drawings in any manner it desires; provided, however, that the ENGINEER shall not be liable for the use of such drawings for any project other than the PROJECT described herein.

E. Engineer's Personnel at Construction Site

(1) The presence or duties of the ENGINEER's personnel at a construction site, whether as on-site representatives or otherwise, do not make the ENGINEER or its personnel in any way responsible for those duties that belong to the CITY and/or the CITY's construction contractors or other entities, and do not relieve the construction contractors or any other entity of their obligations, duties, and responsibilities, including, but not limited to, all construction methods, means, techniques, sequences, and procedures necessary for coordinating and completing all portions of the construction work in accordance with the AGREEMENT Documents and any health or safety precautions required by such construction work. The ENGINEER and its personnel have no authority to exercise any control over any construction contractor or other entity or their employees in connection with their work or any health or safety precautions.

(2) Except to the extent of specific site visits expressly detailed and set forth in Attachment A, the ENGINEER or its personnel shall have no obligation or responsibility to visit the construction site to become familiar with the progress or quality of the completed work on the PROJECT or to determine, in general, if the work on the PROJECT is being performed in a manner indicating that the PROJECT, when completed, will be in accordance with the AGREEMENT

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Documents, nor shall anything in the AGREEMENT Documents or this AGREEMENT between CITY and ENGINEER be construed as requiring ENGINEER to make exhaustive or continuous on-site inspections to discover latent defects in the work or otherwise check the quality or quantity of the work on the PROJECT. If the ENGINEER makes on-site observation(s) of a deviation from the AGREEMENT Documents, the ENGINEER shall inform the CITY.

(3) When professional certification of performance or characteristics of materials, systems or equipment is reasonably required to perform the services set forth in the Scope of Services, the ENGINEER shall be entitled to rely upon such certification to establish materials, systems or equipment and performance criteria to be required in the AGREEMENT Documents.

F. Opinions of Probable Cost, Financial Considerations, and Schedules

(1) The ENGINEER shall provide opinions of probable costs based on the current available information at the time of preparation, in accordance with Attachment A.

(2) In providing opinions of cost, financial analyses, economic feasibility projections, and schedules for the PROJECT, the ENGINEER has no control over cost or price of labor and materials; unknown or latent conditions of existing equipment or structures that may affect operation or maintenance costs; competitive bidding procedures and market conditions; time or quality of performance by third parties; quality, type, management, or direction of operating personnel; and other economic and operational factors that may materially affect the ultimate PROJECT cost or schedule. Therefore, the ENGINEER makes no warranty that the CITY's actual PROJECT costs, financial aspects, economic feasibility, or schedules will not vary from the ENGINEER's opinions, analyses, projections, or estimates.

G. Construction Progress Payments

Recommendations by the ENGINEER to the CITY for periodic construction progress payments to the construction contractor will be based on the ENGINEER's knowledge, information, and belief from selective sampling and observation that the work has progressed to the point indicated. Such recommendations do not represent that continuous or detailed examinations have been made by the ENGINEER to ascertain that the construction contractor has completed the work in exact accordance with the AGREEMENT Documents; that the final work will be acceptable in all respects; that the ENGINEER has made an examination to ascertain how or for what purpose the construction contractor has used the moneys paid; that title to any of the work, materials, or equipment has passed to the CITY free and clear of liens, claims, security interests, or encumbrances; or that there are not other matters at issue between the CITY and the construction contractor that affect the amount that should be paid.

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H. Record Drawings

Record drawings, if required, will be prepared, in part, on the basis of information compiled and furnished by others, and may not always represent the exact location, type of various components, or exact manner in which the PROJECT was finally constructed. The ENGINEER is not responsible for any errors or omissions in the information from others that is incorporated into the record drawings.

I. Right to Audit

(1) ENGINEER agrees that the CITY shall, until the expiration of five (5) years after final payment under this AGREEMENT, have access to and the right to examine and photocopy any directly pertinent books, documents, papers and records of the ENGINEER involving transactions relating to this AGREEMENT. ENGINEER agrees that the CITY shall have access during normal working hours to all necessary ENGINEER facilities and shall be provided adequate and appropriate work space in order to conduct audits in compliance with the provisions of this section. The CITY shall give ENGINEER reasonable advance notice of intended audits.

(2) ENGINEER further agrees to include in all its subconsultant agreements hereunder a provision to the effect that the subconsultant agrees that the CITY shall, until the expiration of five (5) years after final payment under the subcontract, have access to and the right to examine and photocopy any directly pertinent books, documents, papers and records of such subconsultant, involving transactions to the subcontract, and further, that the CITY shall have access during normal working hours to all subconsultant facilities, and shall be provided adequate and appropriate work space, in order to conduct audits in compliance with the provisions of this section together with subsection (3) hereof. CITY shall give subconsultant reasonable advance notice of intended audits.

(3) ENGINEER and subconsultant agree to photocopy such documents as may be requested by the CITY. The CITY agrees to reimburse ENGINEER for the cost of copies at the rate published in the Texas Administrative Code in effect as of the time copying is performed.

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J. INSURANCE

(1) ENGINEER'S INSURANCE

a. Commercial General Liability – the ENGINEER shall maintain commercial general liability (CGL) and, if necessary, commercial umbrella insurance with a limit of not less than $1,000,000.00 per each occurrence with a $2,000,000.00 aggregate. If such Commercial General Liability insurance contains a general aggregate limit, it shall apply separately to this PROJECT or location.

   i. The CITY shall be included as an additional insured with all rights of defense under the CGL, using ISO additional insured endorsement or a substitute providing equivalent coverage, and under the commercial umbrella, if any. This insurance shall apply as primary insurance with respect to any other insurance or self-insurance programs afforded to the CITY. The Commercial General Liability insurance policy shall have no exclusions or endorsements that would alter or nullify: premises/operations, products/completed operations, contractual, personal injury, or advertising injury, which are normally contained within the policy, unless the CITY specifically approves such exclusions in writing.

   ii. ENGINEER waives all rights against the CITY and its agents, officers, directors and employees for recovery of damages to the extent these damages are covered by the commercial general liability or commercial umbrella liability insurance maintained in accordance with this AGREEMENT.

b. Business Auto – the ENGINEER shall maintain business auto liability and, if necessary, commercial umbrella liability insurance with a limit of not less than $1,000,000 each accident. Such insurance shall cover liability arising out of "any auto", including owned, hired, and non-owned autos, when said vehicle is used in the course of the PROJECT. If the engineer owns no vehicles, coverage for hired or non-owned is acceptable.

   i. ENGINEER waives all rights against the CITY and its agents, officers, directors and employees for recovery of damages to the extent these damages are covered by the business auto liability or commercial umbrella liability insurance obtained by ENGINEER pursuant to this AGREEMENT or under any applicable auto physical damage coverage.

c. Workers' Compensation – ENGINEER shall maintain workers compensation and employers liability insurance and, if necessary,

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commercial umbrella liability insurance with a limit of not less than $100,000.00 each accident for bodily injury by accident or $100,000.00 each employee for bodily injury by disease, with $500,000.00 policy limit.

i. ENGINEER waives all rights against the CITY and its agents, officers, directors and employees for recovery of damages to the extent these damages are covered by workers compensation and employer's liability or commercial umbrella insurance obtained by ENGINEER pursuant to this AGREEMENT.

d. Professional Liability – ENGINEER shall maintain professional liability, a claims-made policy, with a minimum of $1,000,000.00 per claim and aggregate. The policy shall contain a retroactive date prior to the date of the AGREEMENT or the first date of services to be performed, whichever is earlier. Coverage shall be maintained for a period of 5 years following the completion of the AGREEMENT. An annual certificate of insurance specifically referencing this PROJECT shall be submitted to the CITY for each year following completion of the AGREEMENT.

(2) GENERAL INSURANCE REQUIREMENTS

a. Certificates of insurance evidencing that the ENGINEER has obtained all required insurance shall be attached to this AGREEMENT prior to its execution.

b. Applicable policies shall be endorsed to name the CITY an Additional Insured thereon, subject to any defense provided by the policy, as its interests may appear. The term CITY shall include its employees, officers, officials, agents, and volunteers as respects the contracted services.

c. Certificate(s) of insurance shall document that insurance coverage specified in this AGREEMENT are provided under applicable policies documented thereon.

d. Any failure on part of the CITY to attach the required insurance documentation hereto shall not constitute a waiver of the insurance requirements.

e. A minimum of thirty (30) days notice of cancellation or material change in coverage shall be provided to the CITY. A ten (10) days notice shall be acceptable in the event of non-payment of premium. Notice shall be sent to the respective Department Director (by name), City of Denton, 901 Texas Street, Denton, Texas 76209.

f. Insurers for all policies must be authorized to do business in the State of

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Texas and have a minimum rating of A:V or greater, in the current A.M. Best Key Rating Guide or have reasonably equivalent financial strength and solvency to the satisfaction of Risk Management.

g. Any deductible or self insured retention in excess of $25,000.00 that would change or alter the requirements herein is subject to approval by the CITY in writing, if coverage is not provided on a first-dollar basis. The CITY, at it sole discretion, may consent to alternative coverage maintained through insurance pools or risk retention groups. Dedicated financial resources or letters of credit may also be acceptable to the CITY.

h. Applicable policies shall each be endorsed with a waiver of subrogation in favor of the CITY as respects the PROJECT.

i. The CITY shall be entitled, upon its request and without incurring expense, to review the ENGINEER's insurance policies including endorsements thereto and, at the CITY's discretion; the ENGINEER may be required to provide proof of insurance premium payments.

j. Lines of coverage, other than Professional Liability, underwritten on a claims-made basis, shall contain a retroactive date coincident with or prior to the date of the AGREEMENT. The certificate of insurance shall state both the retroactive date and that the coverage is claims-made.

k. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption nor restrictive modification or changes from date of commencement of the PROJECT until final payment and termination of any coverage required to be maintained after final payments.

l. The CITY shall not be responsible for the direct payment of any insurance premiums required by this AGREEMENT.

m. Sub consultants and subcontractors to/of the ENGINEER shall be required by the ENGINEER to maintain the same or reasonably equivalent insurance coverage as required for the ENGINEER. When sub consultants/subcontractors maintain insurance coverage, ENGINEER shall provide CITY with documentation thereof on a certificate of insurance.

K. Independent Consultant

The ENGINEER agrees to perform all services as an independent consultant and not as a subcontractor, agent, or employee of the CITY. The doctrine of *respondeat superior* shall not apply.

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L. Disclosure

The ENGINEER acknowledges to the CITY that it has made full disclosure in writing of any existing conflicts of interest or potential conflicts of interest, including personal financial interest, direct or indirect, in property abutting the proposed PROJECT and business relationships with abutting property cities. The ENGINEER further acknowledges that it will make disclosure in writing of any conflicts of interest that develop subsequent to the signing of this AGREEMENT and prior to final payment under the AGREEMENT.

M. Asbestos or Hazardous Substances

(1) If asbestos or hazardous substances in any form are encountered or suspected, the ENGINEER will stop its own work in the affected portions of the PROJECT to permit testing and evaluation.

(2) If asbestos or other hazardous substances are suspected, the CITY may request the ENGINEER to assist in obtaining the services of a qualified subcontractor to manage the remediation activities of the PROJECT.

N. Permitting Authorities - Design Changes

If permitting authorities require design changes so as to comply with published design criteria and/or current engineering practice standards which the ENGINEER should have been aware of at the time this AGREEMENT was executed, the ENGINEER shall revise plans and specifications, as required, at its own cost and expense. However, if design changes are required due to the changes in the permitting authorities' published design criteria and/or practice standards criteria which are published after the date of this AGREEMENT which the ENGINEER could not have been reasonably aware of, the ENGINEER shall notify the CITY of such changes and an adjustment in compensation will be made through an amendment to this AGREEMENT.

O. Schedule

ENGINEER shall manage the PROJECT in accordance with the schedule developed per Attachment A to this AGREEMENT.

P. Equal Opportunity

(1) **Equal Employment Opportunity:** ENGINEER and ENGINEER's agents shall engage in any discriminatory employment practice. No person shall, on the grounds of race, sex, sexual orientation, age, disability, creed, color, genetic testing, or national origin, be refused the benefits of, or be otherwise subjected to discrimination under any activities resulting from this AGREEMENT.

(2) **Americans with Disabilities Act (ADA) Compliance:** ENGINEER and

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ENGINEER's agents shall not engage in any discriminatory employment practice against individuals with disabilities as defined in the ADA.

SECTION 5
Obligations of the City

A. City-Furnished Data

ENGINEER may rely upon the accuracy, timeliness, and completeness of the information provided by the CITY.

B. Access to Facilities and Property

The CITY will make its facilities accessible to the ENGINEER as required for the ENGINEER's performance of its services. The CITY will perform, at no cost to the ENGINEER, such tests of equipment, machinery, pipelines, and other components of the CITY's facilities as may be required in connection with the ENGINEER's services. The CITY will be responsible for all acts of the CITY's personnel.

C. Advertisements, Permits, and Access

Unless otherwise agreed to in the Scope of Services, the CITY will obtain, arrange, and pay for all advertisements for bids; permits and licenses required by local, state, or federal authorities; and land, easements, rights-of-way, and access necessary for the ENGINEER's services or PROJECT construction.

D. Timely Review

The CITY will examine the ENGINEER's studies, reports, sketches, drawings, specifications, proposals, and other documents; obtain advice of an attorney, insurance counselor, accountant, auditor, bond and financial advisors, and other consultants as the CITY deems appropriate; and render in writing decisions required by the CITY in a timely manner in accordance with the PROJECT schedule prepared in accordance with Attachment A.

E. Prompt Notice

The CITY will give prompt written notice to the ENGINEER whenever CITY observes or becomes aware of any development that affects the scope or timing of the ENGINEER's services or of any defect in the work of the ENGINEER or construction contractors.

F. Asbestos or Hazardous Substances Release.

(1) CITY acknowledges ENGINEER will perform part of the work at CITY's facilities that may contain hazardous materials, including asbestos containing

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materials, or conditions, and that ENGINEER had no prior role in the generation, treatment, storage, or disposition of such materials. In consideration of the associated risks that may give rise to claims by third parties or employees of City, City hereby releases ENGINEER from any damage or liability related to the presence of such materials.

(2) The release required above shall not apply in the event the discharge, release or escape of hazardous substances, contaminants, or asbestos is a result of ENGINEER's negligence or if ENGINEER brings such hazardous substance, contaminant or asbestos onto the PROJECT.

G. Contractor Indemnification and Claims

The CITY agrees to include in all construction contracts the provisions of Article IV.E. regarding the ENGINEER's Personnel at Construction Site, and provisions providing for contractor indemnification of the CITY and the ENGINEER for contractor's negligence.

H. Contractor Claims and Third-Party Beneficiaries

(1) The CITY agrees to include the following clause in all contracts with construction contractors and equipment or materials suppliers:

> "Contractors, subcontractors and equipment and materials suppliers on the PROJECT, or their sureties, shall maintain no direct action against the ENGINEER, its officers, employees, and subcontractors, for any claim arising out of, in connection with, or resulting from the engineering services performed. Only the CITY will be the beneficiary of any undertaking by the ENGINEER."

(2) This AGREEMENT gives no rights or benefits to anyone other than the CITY and the ENGINEER and there are no third-party beneficiaries.

(3) The CITY will include in each agreement it enters into with any other entity or person regarding the PROJECT a provision that such entity or person shall have no third-party beneficiary rights under this AGREEMENT.

(4) Nothing contained in this Section H. shall be construed as a waiver of any right the CITY has to bring a claim against ENGINEER.

I. CITY's Insurance

(1) The CITY may maintain property insurance on certain pre-existing structures associated with the PROJECT.

(2) The CITY may secure Builders Risk/Installation insurance at the replacement cost value of the PROJECT. The CITY may provide ENGINEER a copy of the policy or documentation of such on a certificate of insurance.

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J. Litigation Assistance

The Scope of Services does not include costs of the ENGINEER for required or requested assistance to support, prepare, document, bring, defend, or assist in litigation undertaken or defended by the CITY. In the event CITY requests such services of the ENGINEER, this AGREEMENT shall be amended or a separate agreement will be negotiated between the parties.

K. Changes

The CITY may make or approve changes within the general Scope of Services in this AGREEMENT. If such changes affect the ENGINEER's cost of or time required for performance of the services, an equitable adjustment will be made through an amendment to this AGREEMENT with appropriate CITY approval.

SECTION 6
General Legal Provisions

A. Authorization to Proceed

ENGINEER shall be authorized to proceed with this AGREEMENT upon receipt of a written Notice to Proceed from the CITY.

B. Reuse of Project Documents

All designs, drawings, specifications, documents, and other work products of the ENGINEER, whether in hard copy or in electronic form, are instruments of service for this PROJECT, whether the PROJECT is completed or not. Reuse, change, or alteration by the CITY or by others acting through or on behalf of the CITY of any such instruments of service without the written permission of the ENGINEER will be at the CITY's sole risk. The CITY shall own the final designs, drawings, specifications and documents.

C. Force Majeure

The ENGINEER is not responsible for damages or delay in performance caused by acts of God, strikes, lockouts, accidents, or other events beyond the control of the ENGINEER that prevent ENGINEER’s performance of its obligations hereunder.

D. Termination

(1) This AGREEMENT may be terminated:

a. by the City for its convenience upon 30 days' written notice to ENGINEER.

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b. by either the CITY or the ENGINEER for cause if either party fails substantially to perform through no fault of the other and the nonperforming party does not commence correction of such nonperformance within 5 days' written notice or thereafter fails to diligently complete the correction.

(2) If this AGREEMENT is terminated for the convenience of the City, the ENGINEER will be paid for termination expenses as follows:

a. Cost of reproduction of partial or complete studies, plans, specifications or other forms of ENGINEER'S work product;

b. Out-of-pocket expenses for purchasing electronic data files and other data storage supplies or services;

c. The time requirements for the ENGINEER'S personnel to document the work underway at the time of the CITY'S termination for convenience so that the work effort is suitable for long time storage.

(3) Prior to proceeding with termination services, the ENGINEER will submit to the CITY an itemized statement of all termination expenses. The CITY'S approval will be obtained in writing prior to proceeding with termination services.

E. Suspension, Delay, or Interruption to Work

The CITY may suspend, delay, or interrupt the services of the ENGINEER for the convenience of the CITY. In the event of such suspension, delay, or interruption, an equitable adjustment in the PROJECT's schedule, commitment and cost of the ENGINEER's personnel and subcontractors, and ENGINEER's compensation will be made.

F. Indemnification

IN ACCORDANCE WITH TEXAS LOCAL GOVERNMENT CODE SECTION 271.904, THE ENGINEER SHALL INDEMNIFY OR HOLD HARMLESS THE CITY AGAINST LIABILITY FOR ANY DAMAGE COMMITTED BY THE ENGINEER OR ENGINEER'S AGENT, CONSULTANT UNDER CONTRACT, OR ANOTHER ENTITY OVER WHICH THE ENGINEER EXERCISES CONTROL TO THE EXTENT THAT THE DAMAGE IS CAUSED BY OR RESULTING FROM AN ACT OF NEGLIGENCE, INTENTIONAL TORT, INTELLECTUAL PROPERTY INFRINGEMENT, OR FAILURE TO PAY A SUBCONTRACTOR OR SUPPLIER. CITY IS ENTITLED TO RECOVER ITS REASONABLE ATTORNEY'S FEES IN PROPORTION TO THE ENGINEER'S LIABILITY.

G. Assignment

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Neither party shall assign all or any part of this AGREEMENT without the prior written consent of the other party.

H. Jurisdiction

The law of the State of Texas shall govern the validity of this AGREEMENT, its interpretation and performance, and any other claims related to it. The venue for any litigation related to this AGREEMENT shall be Denton County, Texas.

I. Severability and Survival

If any of the provisions contained in this AGREEMENT are held for any reason to be invalid, illegal, or unenforceable in any respect, such invalidity, illegality, or unenforceability will not affect any other provision, and this AGREEMENT shall be construed as if such invalid, illegal, or unenforceable provision had never been contained herein. Sections 5.F., 6.B., 6.D., 6.F., 6.H., and 6.I. shall survive termination of this AGREEMENT for any cause.

J. Observe and Comply

ENGINEER shall at all times observe and comply with all federal and State laws and regulations and with all City ordinances and regulations which in any way affect this AGREEMENT and the work hereunder, and shall observe and comply with all orders, laws ordinances and regulations which may exist or may be enacted later by governing bodies having jurisdiction or authority for such enactment. No plea of misunderstanding or ignorance thereof shall be considered. **ENGINEER AGREES TO DEFEND, INDEMNIFY AND HOLD HARMLESS CITY AND ALL OF ITS OFFICERS, AGENTS AND EMPLOYEES FROM AND AGAINST ALL CLAIMS OR LIABILITY ARISING OUT OF THE VIOLATION OF ANY SUCH ORDER, LAW, ORDINANCE, OR REGULATION, WHETHER IT BE BY ITSELF OR ITS EMPLOYEES**.

K. Immigration Nationality Act

ENGINEER shall verify the identity and employment eligibility of its employees who perform work under this AGREEMENT, including completing the Employment Eligibility Verification Form (I-9). Upon request by CITY, ENGINEER shall provide CITY with copies of all I-9 forms and supporting eligibility documentation for each employee who performs work under this AGREEMENT. ENGINEER shall adhere to all Federal and State laws as well as establish appropriate procedures and controls so that no services will be performed by any ENGINEER employee who is not legally eligible to perform such services. **ENGINEER SHALL INDEMNIFY CITY AND HOLD CITY HARMLESS FROM ANY PENALTIES, LIABILITIES, OR LOSSES DUE TO VIOLATIONS OF THIS PARAGRAPH BY ENGINEER, ENGINEER'S EMPLOYEES, SUBCONTRACTORS, AGENTS, OR LICENSEES.** CITY, upon written notice to ENGINEER, shall have the right to immediately terminate this AGREEMENT for violations of this provision by ENGINEER.

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L. Prohibition on Contracts with Companies Boycotting Israel

Engineer acknowledges that in accordance with Chapter 2271 of the Texas Government Code, City is prohibited from entering into a contract with a company for goods or services unless the contract contains a written verification from the company that it: (1) does not boycott Israel; and (2) will not boycott Israel during the term of the contract. The terms "boycott Israel" and "company" shall have the meanings ascribed to those terms in Section 808.001 of the Texas Government Code. ***By signing this agreement, Engineer certifies that Engineer's signature provides written verification to the City that Engineer: (1) does not boycott Israel; and (2) will not boycott Israel during the term of the agreement.*** Failure to meet or maintain the requirements under this provision will be considered a material breach.

M. Prohibition on Contracts with Companies Doing Business with Iran, Sudan, or a Foreign Terrorist Organization

Sections 2252 and 2270 of the Texas Government Code restricts CITY from contracting with companies that do business with Iran, Sudan, or a foreign terrorist organization. ***By signing this agreement, Engineer certifies that Engineer's signature provides written verification to the City that Engineer, pursuant to Chapters 2252 and 2270, is not ineligible to enter into this agreement and will not become ineligible to receive payments under this agreement by doing business with Iran, Sudan, or a foreign terrorist organization***. Failure to meet or maintain the requirements under this provision will be considered a material breach.

N. Prohibition on Contracts with Companies Boycotting Certain Energy Companies

Engineer acknowledges that in accordance with Chapter 2274 of the Texas Government Code, City is prohibited from entering into a contract with a company for goods or services unless the contract contains written verification from the company that it (1) does not boycott energy companies; and (2) will not boycott energy companies during the term of the contract. The terms "boycott energy company" and "company" shall have the meanings ascribed to those terms in Section 809.001 of the Texas Government Code. ***By signing this agreement, Engineer certifies that Engineer's signature provides written verification to the City that Engineer: (1) does not boycott energy companies; and (2) will not boycott energy companies during the term of the agreement.*** Failure to meet or maintain the requirements under this provision will be considered a material breach.

O. Prohibition on Contracts with Companies Boycotting Certain Firearm Entities and Firearm Trade Associations

Engineer acknowledges that in accordance with Chapter 2274 of the Texas Government Code, City is prohibited from entering into a contract with a company for goods or services unless the contract contains written verification from the company

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that it (1) does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association; and (2) will not discriminate during the term of the contract against a firearm entity or firearm trade association. The terms "discriminate against a firearm entity or firearm trade association," "firearm entity" and "firearm trade association" shall have the meanings ascribed to those terms in Chapter 2274 of the Texas Government Code. ***By signing this agreement, Engineer certifies that Engineer's signature provides written verification to the City that Engineer: (1) does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association; and (2) will not discriminate during the term of the contract against a firearm entity or firearm trade association.*** Failure to meet or maintain the requirements under this provision will be considered a material breach.

P. Termination Right for Contracts with Companies Doing Business with Certain Foreign-Owned Companies

The City of Denton may terminate this Contract immediately without any further liability if the City of Denton determines, in its sole judgment, that this Contract meets the requirements under Chapter 2274, and Engineer is, or will be in the future, (i) owned by or the majority of stock or other ownership interest of the company is held or controlled by individuals who are citizens of China, Iran, North Korea, Russia, or other designated country (ii) directly controlled by the Government of China, Iran, North Korea, Russia, or other designated country, or (iii) is headquartered in China, Iran, North Korea, Russia, or other designated country.

Q. Prohibition Against Personal Interest in Contracts

No officer, employee, independent consultant, or elected official of the City who is involved in the development, evaluation, or decision-making process of the performance of any solicitation shall have a financial interest, direct or indirect, in the Contract resulting from that solicitation as defined in the City's Ethic Ordinance 23-1165 and in the City Charter chapter 2 article XI(Ethics). Any willful violation of this section shall constitute impropriety in office, and any officer or employee guilty thereof shall be subject to disciplinary action up to and including dismissal. Any violation of this provision, with the knowledge, expressed or implied, of the Contractor shall render the Contract voidable by the City. The Contractor shall complete and submit the City's Conflict of Interest Questionnaire.

R. Certificate of Interested Parties Electronic Filing

In 2015, the Texas Legislature adopted House Bill 1295, which added section 2252.908 of the Government Code. The law states that the City may not enter into this contract unless the Contractor submits a disclosure of interested parties (Form 1295) to the City at the time the Contractor submits the signed contract. The Texas Ethics Commission has adopted rules requiring the business entity to file Form 1295 electronically with the Commission.

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Contractor will be required to furnish a Certificate of Interest Parties before the contract is awarded, in accordance with Government Code 2252.908.

The contractor shall:

1. Log onto the State Ethics Commission Website at : https://www.ethics.state.tx.us/filinginfo/1295/
2. Register utilizing the tutorial provided by the State
3. Print a copy of the completed Form 1295
4. Enter the Certificate Number on page 2 of this contract.
5. Complete and sign the Form 1295
6. Email the form to purchasing@cityofdenton.com with the contract number in the subject line. (EX: Contract 1234 – Form 1295)

The City must acknowledge the receipt of the filed Form 1295 not later than the 30th day after Council award. Once a Form 1295 is acknowledged, it will be posted to the Texas Ethics Commission's website within seven business days.

S. Agreement Documents

This AGREEMENT, including its attachments and schedules, constitutes the entire AGREEMENT, which supersedes all prior written or oral understandings, and may only be changed by a written amendment executed by both parties. This AGREEMENT may be executed in one or more counterparts and each counterpart shall, for all purposes, be deemed an original, but all such counterparts shall together constitute but one and the same instrument. The following attachments and schedules are hereby made a part of this AGREEMENT:

Attachment A - Scope of Services, Compensation, and Project Schedule

These documents make up the AGREEMENT documents and what is called for by one shall be as binding as if called for by all. In the event of an inconsistency or conflict in any of the provisions of the AGREEMENT documents, the inconsistency or conflict shall be resolved by giving precedence first to the written AGREEMENT then to the AGREEMENT documents in the order in which they are listed above.

The parties agree to transact business electronically. Any statutory requirements that certain terms be in writing will be satisfied using electronic documents and signing. Electronic signing of this document will be deemed an original for all legal purposes.

Duly executed by each party's designated representative to be effective on _____.

Docusign Envelope ID: 6E135FBB-0C86-45CA-B556-D781C4FDB21A

BY:
CITY OF DENTON, TEXAS

Sara Hensley, City Manager

BY:
ENGINEER
Coleman & Assoc. Land Surveying

Signed by:
William M. Coleman RPLS, CEO
F48C7825FC014BB...

Authorized Agent, Title

Full Name: William M. Coleman

2025- 1388860

TEXAS ETHICS COMMISSION
CERTIFICATE NUMBER

Docusign Envelope ID: 6E135FBB-0C86-45CA-B556-D781C4FDB21A

THIS AGREEMENT HAS BEEN BOTH REVIEWED AND APPROVED as to financial and operational obligations and business terms.

Signed by:
C3C63BE563154A1...
Signature

Director
Title

Solid Waste
Department

Date Signed: 11/13/2025

ATTEST:
_____ CITY SECRETARY

BY: _____

APPROVED AS TO LEGAL FORM:
MACK REINWAND, CITY ATTORNEY

DocuSigned by:
Marcella Lunn
4B070831B4AA438...
BY: _____

Docusign Envelope ID: 6E135FBB-0C86-45CA-B556-D781C4FDB21A

ATTACHMENT A

Coleman & Assoc. Land Surveying
P. O. Box 686
Denton, Texas 76202
Phone (940)565-8215 Fax (940)565-9800
REGISTRATION #10095100

August 26, 2025

Randall Morris
City of Denton Landfill
1527 South Mayhill Rd.
Denton, Texas 76208
(940) 349-8001

Re: Proposal for Surveying Services for Cell 6

Mr. Morris,

Pursuant to your request, Coleman & Assoc. Land Surveying is pleased to provide you with the following agreement to provide professional surveying services.

1. Project Description

The project consists of using GPS and conventional Surveying methods to provide topographic information for the construction of Cell 6, as shown on the plans prepared by Parkhill and released July 24, 2025. Surveys will be performed for the following:

A. Pre-Construction Data
- 50’ Grid of Cell 6
- 50’ Grid outside Cell 6 to include slopes & ditches (North, East, and South)
- Topographic Survey Drawings for Cell 6, displaying one foot contours
- Pre-Construction Stockpile topography
- Topographic Survey Drawings of pre-construction stockpiles, displaying one foot contours
- Volume Report – stockpiled material, includes estimating bottom surface from archival and photogrammetric data

B. QC/QA Survey Cell 6 Report Sub-grade (Verify Construction)
- 50’ Grid of Cell 6
- 50’ Grid outside Cell 6 to include slopes & ditches
- Volume Report (comparing final sub-grade and original surface surveyed by Coleman & Assoc. Land Surveying from Section A above)
- Topographic Survey Drawings for Cell 6 displaying one foot contours
- Excavation/fill Report for Cell 6 with certification

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- Volume Report for areas outside of Cell 6, bottom of excavated/filled areas to sub-grade

C. QC/QA Survey Cell 6 Report Top of Clay Liner
- 50' Grid of Cell 6
- 50' Grid outside Cell 6 to include slopes & ditches as required
- Topographic Survey Drawings for Cell 6 displaying one foot contours
- Excavation/fill Report with certifications

D. QC/QA Survey Cell 6 Liner Report Protective Cover Geomembrane / Geocomposite
- Locate panels and repairs
- Fabric Liner Report with Certification

E. Topographic Survey Cell 6 Final Soil
- 50' Grid of Cell 6
- 50' Grid outside Cell 6 to include slopes & ditches as required
- Topographic Survey Drawings for Cell 6 displaying one foot contours
- Excavation / Fill Report with certification

F. QC/QA Survey Additional Drainage (East Pond)
- 50' Grid and concrete structures
- Topographic Survey Drawings displaying one foot contours
- Excavation / Fill Report with certification

2. Basic Services

The basic services Coleman & Assoc. Land Surveying will provide on this project, acting in the capacity of a professional surveyor include, but are not limited to, the following:

A. Provide QC/QA field support and information on Cell 6 and the Detention Pond area using previously established control and reference datum.

B. Prepare Reports and Topographic Survey drawings showing the results of the survey. Any re-staking due to construction knock-outs will result in additional charges not included in basic services.

C. Provide information and consulting to other firms, institutions, agencies or individuals as specified by the Landfill staff to coordinate the development of the landfill.

3. Understanding of Project Conditions

This project is based on the following understanding of project conditions:

A. Coleman & Assoc. Land Surveying must comply with applicable state and local regulations.

B. Coleman & Assoc. Land Surveying will provide QC/QA for grading purposes.

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C. City of Denton will provide a project representative (Randall Morris or other designated person) who will have the authority to receive reports, coordinate activities of city staff, and determine the information and/or report formats required as the project proceeds. As conflicts and discrepancies are discovered, they will be resolved in the most expedient manner possible.

D. Coleman & Assoc. Land Surveying will provide project management for all surveying and mapping services necessary to accomplish the basic services outlined above. The project will utilize real time GPS technology as well as conventional surveying methods. Fieldwork will be coordinated with the landfill staff on site.

E. Coleman & Assoc. Land Surveying will deliver a copy of all exhibits, surveying notes and database information used to accomplish each task as required.

4. Compensation

Compensation will be on a cost – plus basis. The Project estimate (Exhibit A) is attached to this document (basic administrative and support costs are built into the stated rates). This breakdown of costs covers only one-time surveying of data points. Any re-staking due to construction knock-outs or revised plans could result in additional charges.

Coleman & Assoc. Land Surveying may submit invoices on a monthly basis for work performed in the previous 30 day period.

5. Time of Performance

Surveying services will continue on the normal schedule or as needed upon authorization from the landfill staff until 30 days after written notice to cease work. A 48-hour notification from the client will be required prior to Coleman & Assoc. Land Surveying scheduling field time. Less than proper notice could result in an additional charge.

6. Reporting

Any formal complaints concerning professional surveying services performed by Coleman & Associates Land Surveying can be made to:

Texas Board of Professional Engineers and Land Surveyors
http://pels.texas.gov
Mailing Address
1917 S. Interstate 35
Austin, Texas 78741
Phone: 512-440-7723

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7. Authorizations and Agreement

Coleman & Assoc. Land Surveying and the City of Denton each agree to the terms of this proposal. The signature below authorizes Coleman & Associates Land Surveying, Inc. to proceed with work on the project.

Coleman & Assoc. Land Surveying

By: _____ Date: _____
Wm. M. Coleman, R.P.L.S., CEO

Client: City of Denton

By: _____ Date: _____
Representative's Signature

Docusign Envelope ID: 6E135FBB-0C86-45CA-B556-D781C4FDB21A

CELL 6 CONSTRUCTION

FEE ESTIMATE

Pre-Construction Topo			
FIELD	39 HRS	240 $/HR	$9,360
PROFESSIONAL	18 HRS	200 $/HR	$3,600
TECHNICIAN	40 HRS	125 $/HR	$5,000
CLERICAL	6 HRS	70 $/HR	$420
Drawings and Reports	35 HRS	125 $/HR	$4,375
		SUBTOTAL	$22,755

QC/QA Sub-grade			
FIELD	85 HRS	240 $/HR	$20,400
PROFESSIONAL	69 HRS	200 $/HR	$13,800
TECHNICIAN	69 HRS	125 $/HR	$8,625
CLERICAL	2.5 HRS	70 $/HR	$175
EXCAVATION VOLUME REPORT	35 HRS	125 $/HR	$4,375
		SUBTOTAL	$47,375

QC/QA Clay Liner			
FIELD	63 HRS	240 $/HR	$15,120
PROFESSIONAL	48 HRS	200 $/HR	$9,600
TECHNICIAN	126 HRS	125 $/HR	$15,750
CLERICAL	4 HRS	70 $/HR	$280
		SUBTOTAL	$40,750

QC/QA Plastic			
FIELD	44 HRS	240 $/HR	$10,560
PROFESSIONAL	30 HRS	200 $/HR	$6,000
TECHNICIAN	80 HRS	125 $/HR	$10,000
CLERICAL	3 HRS	70 $/HR	$210
		SUBTOTAL	$26,770

QC/QA Soil Cover			
FIELD	35 HRS	240 $/HR	$8,400
PROFESSIONAL	6 HRS	200 $/HR	$1,200
TECHNICIAN	23 HRS	125 $/HR	$2,875
CLERICAL	4 HRS	70 $/HR	$280
		SUBTOTAL	$12,755

QC/QA Additional Drainage (East Pond)			
FIELD	12 HRS	240 $/HR	$2,880
PROFESSIONAL	6 HRS	200 $/HR	$1,200
TECHNICIAN	12 HRS	125 $/HR	$1,500
CLERICAL	4 HRS	70 $/HR	$280
		SUBTOTAL	$5,860

TOTAL ESTIMATED FEE - APPROXIMATELY	**$156,265**

Docusign Envelope ID: 6E135FBB-0C86-45CA-B556-D781C4FDB21A

CONFLICT OF INTEREST QUESTIONNAIRE - FORM CIQ

For vendor or other person doing business with local governmental entity

This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code, by a vendor who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the vendor meets requirements under Section 176.006(a) and by City of Denton Ethics Code, Ordinance 18-757.
By law this questionnaire must be filed with the records administrator of the local government entity not later than the 7th business day after the date the vendor becomes aware of facts that require the statement to be filed. *See* Section 176.006(a-1), Local Government Code.

A vendor commits an offense if the vendor knowingly violates Section 176.006, Local Government Code. An offense under this section is a misdemeanor.

1 **Name of vendor who has a business relationship with local governmental entity.**

COLEMAN & ASSOC. LAND SURVEYING

2 [X] **Check this box if you are filing an update to a previously filed questionnaire.**

(The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date on which you became aware that the originally filed questionnaire was incomplete or inaccurate.)

3 **Name of local government officer about whom the information in this section is being disclosed.**

_____
Name of Officer

Describe each employment or other business relationship with the local government officer, or a family member of the officer, as described by Section 176.003(a)(2)(A). Also describe any family relations hip with the local government officer. This section, (item 3 including subparts A, B, C & D), must be completed for each officer with whom the vendor has an employment or other business relationship as defined by Section 176.001(1-a), Local Government Code. Attach additional pages to this Form CIQ as necessary.

A. Is the local government officer named in this section receiving or likely to receive taxable income, other than investment income, from the vendor?

[ ] Yes [X] No

B. Is the vendor receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer named in this section AND the taxable income is not received from the local governmental entity?

[ ] Yes [X] No

C. Is the filer of this questionnaire employed by a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership of one percent or more?

[ ] Yes [X] No

D. Describe each employment or business and family relationship with the local government officer named in this section.

4 [X] **I have no Conflict of Interest to disclose.**

5 Signed by: William M. Coleman F48C7825FC914BB...

Signature of vendor doing business with the governmental entity

11/13/2025
Date

Docusign Envelope ID: 6E135FBB-0C86-45CA-B556-D781C4FDB21A

CONFLICT OF INTEREST QUESTIONNAIRE
For vendor doing business with local governmental entity

A complete copy of Chapter 176 of the Local Government Code may be found at http://www.statutes.legis.state.tx.us/ Docs/LG/htm/LG.176.htm. For easy reference, below are some of the sections cited on this form.

Local Government Code § 176.001(1-a): "Business relationship" means a connection between two or more parties based on commercial activity of one of the parties. The term does not include a connection based on:

(A) a transaction that is subject to rate or fee regulation by a federal, state, or local governmental entity or an agency of a federal, state, or local governmental entity;

(B) a transaction conducted at a price and subject to terms available to the public; or

(C) a purchase or lease of goods or services from a person that is chartered by a state or federal agency and that is subject to regular examination by, and reporting to, that agency.

Local Government Code § 176.003(a)(2)(A) and (B):

(A) A local government officer shall file a conflicts disclosure statement with respect to a vendor if:

(2) the vendor:

(A) has an employment or other business relationship with the local government officer or a family member of the officer that results in the officer or family member receiving taxable income, other than investment income, that exceeds $2,500 during the 12-month period preceding the date that the officer becomes aware that

(i) a contract between the local governmental entity and vendor has been executed; or

(ii) the local governmental entity is considering entering into a contract with the vendor;

(B) has given to the local government officer or a family member of the officer one or more gifts that have an aggregate value of more than $100 in the 12-month period preceding the date the officer becomes aware that:

(i) a contract between the local governmental entity and vendor has been executed; or

(ii) the local governmental entity is considering entering into a contract with the vendor.

Local Government Code § 176.006(a) and (a-1)

(a) A vendor shall file a completed conflict of interest questionnaire if the vendor has a business relationship with a local governmental entity and:

(1) has an employment or other business relationship with a local government officer of that local governmental entity, or a family member of the officer, described by Section 176.003(a)(2)(A);

(2) has given a local government officer of that local governmental entity, or a family member of the officer, one or more gifts with the aggregate value specified by Section 176.003(a)(2)(B), excluding any gift described by Section 176.003(a-1); or

(3) has a family relationship with a local government officer of that local governmental entity.

(a-1) The completed conflict of interest questionnaire must be filed with the appropriate records administrator not later than the seventh business day after the later of:

(1) the date that the vendor:

(A) begins discussions or negotiations to enter into a contract with the local governmental entity; or

(B) submits to the local governmental entity an application, response to a request for proposals or bids, correspondence, or another writing related to a potential contract with the local governmental entity; or

(2) the date the vendor becomes aware:

(A) of an employment or other business relationship with a local government officer, or a family member of the officer, described by Subsection (a);

(B) that the vendor has given one or more gifts described by Subsection (a); or

(C) of a family relationship with a local government officer.

City of Denton Ethics Code Ordinance Number 18-757

Definitions:

Relative: a family member related to a City Official within the third 3rd degree of affinity (marriage) or consanguinity (blood or adoption)

City Official: for purpose of this article, the term consists of the Council Members, Department Heads, or member of the Board of Ethics, Planning and zoning Commission Members, Board of Adjustment, Historic Landmark Commission, or Public Utilities Board

Vendor: a person who provides or seeks to provide goods, services, and/or real property to the City in exchange for compensation. This definition does not include those property owners from whom the City acquires public right-of-way or other real property interests for public use.

Per the City of Denton Ethics Code, Section 2-273. – Prohibitions

(3) It shall be a violation of this Article for a Vendor to offer or give a Gift to City Official exceeding fifty dollars ($50.00) per gift, or multiple gifts cumulatively valued at more than two hundred dollars ($200.00) per a single fiscal year.

Per the City of Denton Ethics Code, Section 2-282. – Disposition (b), (5) Ineligibility

If the Board of Ethics finds that a Vendor has violated this Article, the Board may recommend to the City Manager that the Vendor be deemed ineligible to enter into a City contract or other arrangement for goods, services, or real property, for a period of one (1) year.

Certificate Of Completion

Envelope Id: 6E135FBB-0C86-45CA-B556-D781C4FDB21A
Status: Sent
Subject: Please DocuSign: City Council Contract 8525-012 Cell 6 Surveying Services
Source Envelope:
Document Pages: 27
Signatures: 4
Certificate Pages: 6
Initials: 1
AutoNav: Enabled
EnvelopeId Stamping: Enabled
Time Zone: (UTC-06:00) Central Time (US & Canada)

Envelope Originator:
Crystal Westbrook
901B Texas Street
Denton, TX 76209
crystal.westbrook@cityofdenton.com
IP Address: 198.49.140.104

Record Tracking

Status: Original
10/16/2025 8:48:41 AM
Holder: Crystal Westbrook
crystal.westbrook@cityofdenton.com
Location: DocuSign

Signer Events	Signature	Timestamp
Crystal Westbrook crystal.westbrook@cityofdenton.com Senior Buyer City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign	**Completed** Using IP Address: 198.49.140.104	Sent: 10/16/2025 8:56:18 AM Viewed: 10/16/2025 8:56:28 AM Signed: 10/16/2025 8:57:49 AM
Lori Hewell lori.hewell@cityofdenton.com Purchasing Manager City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign	DS LH Signature Adoption: Pre-selected Style Using IP Address: 198.49.140.10	Sent: 10/16/2025 8:57:52 AM Viewed: 10/16/2025 1:28:57 PM Signed: 10/16/2025 1:29:16 PM
Marcella Lunn marcella.lunn@cityofdenton.com Senior Deputy City Attorney City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign	DocuSigned by: Marcella Lunn 4B070831B4AA438... Signature Adoption: Pre-selected Style Using IP Address: 198.49.140.10	Sent: 10/16/2025 1:29:18 PM Viewed: 10/17/2025 2:00:59 PM Signed: 10/17/2025 2:04:55 PM
William M. Coleman bill@calstx.com RPLS, CEO Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Accepted: 11/13/2025 10:25:39 AM ID: 07fbd34d-0919-42bd-a27a-8acd57a3b125	Signed by: William M. Coleman F48C7825FC914BB... Signature Adoption: Pre-selected Style Using IP Address: 47.184.103.70	Sent: 10/17/2025 2:04:59 PM Resent: 11/3/2025 10:58:37 AM Resent: 11/13/2025 9:56:42 AM Resent: 11/13/2025 10:02:03 AM Viewed: 11/13/2025 10:25:39 AM Signed: 11/13/2025 11:35:33 AM

Signer Events	Signature	Timestamp
Brenda Haney brenda.haney@cityofdenton.com Director Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Accepted: 11/13/2025 2:40:14 PM ID: c6f6500a-d2a7-4c83-b0bd-d02fcdcae0cb	 Signature Adoption: Drawn on Device Using IP Address: 166.199.98.99 Signed using mobile	Sent: 11/13/2025 11:35:35 AM Viewed: 11/13/2025 2:40:14 PM Signed: 11/13/2025 2:40:42 PM
Cheyenne Defee cheyenne.defee@cityofdenton.com Procurement Administration Supervisor City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign		Sent: 11/13/2025 2:40:45 PM
Sara Hensley sara.hensley@cityofdenton.com Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign		
Ingrid Rex ingrid.rex@cityofdenton.com Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign		

In Person Signer Events	Signature	Timestamp

Editor Delivery Events	Status	Timestamp

Agent Delivery Events	Status	Timestamp

Intermediary Delivery Events	Status	Timestamp

Certified Delivery Events	Status	Timestamp

Carbon Copy Events	Status	Timestamp
Cheyenne Defee cheyenne.defee@cityofdenton.com Procurement Administration Supervisor City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign	COPIED	Sent: 10/16/2025 8:57:52 AM
Gretna Jones gretna.jones@cityofdenton.com Legal Secretary City of Denton Security Level: Email, Account Authentication (None)	COPIED	Sent: 11/13/2025 2:40:45 PM Viewed: 11/13/2025 4:17:07 PM

Carbon Copy Events	Status	Timestamp
Electronic Record and Signature Disclosure: Not Offered via Docusign		
City Secretary Office citysecretary@cityofdenton.com Security Level: Email, Account Authentication (None)		
Electronic Record and Signature Disclosure: Not Offered via Docusign		
Randall Morris randall.morris@cityofdenton.com Security Level: Email, Account Authentication (None)		
Electronic Record and Signature Disclosure: Accepted: 10/7/2025 3:00:02 PM ID: 9088f970-624b-4eee-8c12-7695c668f624		

Witness Events	Signature	Timestamp

Notary Events	Signature	Timestamp

Envelope Summary Events	Status	Timestamps
Envelope Sent	Hashed/Encrypted	10/16/2025 8:56:18 AM
Envelope Updated	Security Checked	11/13/2025 10:02:03 AM

Payment Events	Status	Timestamps

Electronic Record and Signature Disclosure

ELECTRONIC RECORD AND SIGNATURE DISCLOSURE

From time to time, City of Denton (we, us or Company) may be required by law to provide to you certain written notices or disclosures. Described below are the terms and conditions for providing to you such notices and disclosures electronically through your DocuSign, Inc. (DocuSign) Express user account. Please read the information below carefully and thoroughly, and if you can access this information electronically to your satisfaction and agree to these terms and conditions, please confirm your agreement by clicking the 'I agree' button at the bottom of this document.

Getting paper copies

At any time, you may request from us a paper copy of any record provided or made available electronically to you by us. For such copies, as long as you are an authorized user of the DocuSign system you will have the ability to download and print any documents we send to you through your DocuSign user account for a limited period of time (usually 30 days) after such documents are first sent to you. After such time, if you wish for us to send you paper copies of any such documents from our office to you, you will be charged a $0.00 per-page fee. You may request delivery of such paper copies from us by following the procedure described below.

Withdrawing your consent

If you decide to receive notices and disclosures from us electronically, you may at any time change your mind and tell us that thereafter you want to receive required notices and disclosures only in paper format. How you must inform us of your decision to receive future notices and disclosure in paper format and withdraw your consent to receive notices and disclosures electronically is described below.

Consequences of changing your mind

If you elect to receive required notices and disclosures only in paper format, it will slow the speed at which we can complete certain steps in transactions with you and delivering services to you because we will need first to send the required notices or disclosures to you in paper format, and then wait until we receive back from you your acknowledgment of your receipt of such paper notices or disclosures. To indicate to us that you are changing your mind, you must withdraw your consent using the DocuSign 'Withdraw Consent' form on the signing page of your DocuSign account. This will indicate to us that you have withdrawn your consent to receive required notices and disclosures electronically from us and you will no longer be able to use your DocuSign Express user account to receive required notices and consents electronically from us or to sign electronically documents from us.

All notices and disclosures will be sent to you electronically

Unless you tell us otherwise in accordance with the procedures described herein, we will provide electronically to you through your DocuSign user account all required notices, disclosures, authorizations, acknowledgements, and other documents that are required to be provided or made available to you during the course of our relationship with you. To reduce the chance of you inadvertently not receiving any notice or disclosure, we prefer to provide all of the required notices and disclosures to you by the same method and to the same address that you have given us. Thus, you can receive all the disclosures and notices electronically or in paper format through the paper mail delivery system. If you do not agree with this process, please let us know as described below. Please also see the paragraph immediately above that describes the consequences of your electing not to receive delivery of the notices and disclosures electronically from us.

How to contact City of Denton:
You may contact us to let us know of your changes as to how we may contact you electronically, to request paper copies of certain information from us, and to withdraw your prior consent to receive notices and disclosures electronically as follows:
To contact us by email send messages to: purchasing@cityofdenton.com

To advise City of Denton of your new e-mail address
To let us know of a change in your e-mail address where we should send notices and disclosures electronically to you, you must send an email message to us at melissa.kraft@cityofdenton.com and in the body of such request you must state: your previous e-mail address, your new e-mail address. We do not require any other information from you to change your email address..
In addition, you must notify DocuSign, Inc to arrange for your new email address to be reflected in your DocuSign account by following the process for changing e-mail in DocuSign.

To request paper copies from City of Denton
To request delivery from us of paper copies of the notices and disclosures previously provided by us to you electronically, you must send us an e-mail to purchasing@cityofdenton.com and in the body of such request you must state your e-mail address, full name, US Postal address, and telephone number. We will bill you for any fees at that time, if any.

To withdraw your consent with City of Denton
To inform us that you no longer want to receive future notices and disclosures in electronic format you may:

i. decline to sign a document from within your DocuSign account, and on the subsequent page, select the check-box indicating you wish to withdraw your consent, or you may;
ii. send us an e-mail to purchasing@cityofdenton.com and in the body of such request you must state your e-mail, full name, IS Postal Address, telephone number, and account number. We do not need any other information from you to withdraw consent.. The consequences of your withdrawing consent for online documents will be that transactions may take a longer time to process..

Required hardware and software

Operating Systems:	Windows2000? or WindowsXP?
Browsers (for SENDERS):	Internet Explorer 6.0? or above
Browsers (for SIGNERS):	Internet Explorer 6.0?, Mozilla FireFox 1.0, NetScape 7.2 (or above)
Email:	Access to a valid email account
Screen Resolution:	800 x 600 minimum
Enabled Security Settings:	•Allow per session cookies •Users accessing the internet behind a Proxy Server must enable HTTP 1.1 settings via proxy connection

** These minimum requirements are subject to change. If these requirements change, we will provide you with an email message at the email address we have on file for you at that time providing you with the revised hardware and software requirements, at which time you will have the right to withdraw your consent.

Acknowledging your access and consent to receive materials electronically
To confirm to us that you can access this information electronically, which will be similar to other electronic notices and disclosures that we will provide to you, please verify that you were able to read this electronic disclosure and that you also were able to print on paper or electronically save this page for your future reference and access or that you were able to e-mail this disclosure and consent to an address where you will be able to print on paper or save it for your future reference and access. Further, if you consent to receiving notices and disclosures exclusively in electronic format on the terms and conditions described above, please let us know by clicking the 'I agree' button below.
By checking the 'I Agree' box, I confirm that:

- I can access and read this Electronic CONSENT TO ELECTRONIC RECEIPT OF ELECTRONIC RECORD AND SIGNATURE DISCLOSURES document; and

- I can print on paper the disclosure or save or send the disclosure to a place where I can print it, for future reference and access; and

- Until or unless I notify City of Denton as described above, I consent to receive from exclusively through electronic means all notices, disclosures, authorizations, acknowledgements, and other documents that are required to be provided or made available to me by City of Denton during the course of my relationship with you.

City of Denton

City Hall
215 E. McKinney Street
Denton, Texas
www.cityofdenton.com

AGENDA INFORMATION SHEET

DEPARTMENT: Procurement

ACM: Christine Taylor

DATE: December 15, 2025

SUBJECT

Consider recommending adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute a contract with T.H. Glennon Co., Inc., for the purchase of mulch colorant for the Beneficial Reuse Department; providing for the expenditure of funds therefor; and providing an effective date (RFP 8822 – awarded to T.H. Glennon Co., Inc., for three (3) years, with the option for two (2) additional one (1) year extensions, in the five (5) year not-to-exceed amount of $150,000.00).

STRATEGIC ALIGNMENT

This action supports Key Focus Area: Promote Sustainability and the Environment.

INFORMATION/BACKGROUND

The City of Denton offers a range of eco-friendly, deco-colored mulches in brown and black, catering to landscapers, contractors, and public consumers. These mulches are produced by integrating recycled hardwoods and a long-lasting, environmentally responsible colorant. To ensure cost-effectiveness, the City of Denton utilizes bulk purchasing strategies, despite the per-pound pricing structure of the colorant. In Fiscal Year 2025, the City spent $28,130 on mulch colorant.

Project Description	Historic 5 Year Expenditure
FY 26	$30,000.00
FY 27	30,000.00
FY 28	30,000.00
FY 29	30,000.00
FY 30	30,000.00
Total	**$150,000.00**

The historic cumulative expenditure for mulch colorant acquisition is presented below:

Project Description	Historic 3-Year Expenditure
FY 23	$13,930.00
FY 24	17,780.00
FY 25	28,130.00
Total	**$59,840.00**

Request for Proposals was sent to 418 prospective suppliers of this item, including 23 Denton firms. In addition, specifications were placed on the Procurement website for prospective suppliers to download and advertised in the local newspaper. One (1) proposal was received, and references were checked to ensure the vendor can provide the services requested in the Scope of Work. The proposal was evaluated based upon published criteria, including schedule, compliance with specifications, probable performance, and price. Best and Final Offer (BAFO) was requested from the firm. The department is awarding the contract to T.H. Glennon Co., Inc.

NIGP Code Used for Solicitation:	335, 553, 631, & 665
Notifications sent for Solicitation sent in IonWave:	418
Number of Suppliers that viewed Solicitation in IonWave:	9
HUB-Historically Underutilized Business Invitations sent out:	47
SBE-Small Business Enterprise Invitations sent out:	171
Responses from Solicitation:	1

RECOMMENDATION

Award a contract with T.H. Glennon Co., Inc., for the purchase of mulch colorant for the Beneficial Reuse Department, in a three (3) year, with the option for two (2) additional one (1) year extensions, in the total five (5) year not-to-exceed amount of $150,000.

PRINCIPAL PLACE OF BUSINESS

T.H. Glennon Co., Inc.
Salisbury, MA

SUSTAINABILITY MEASURES

T.H. Glennon manufactures its colorants using only environmentally safe materials. These water-based formulas are specially designed to be nontoxic to children, animals, and plants. The paints are eco-friendly, with no significant environmental hazards associated with their release. Each mulch colorant consists of water, pigments, and minor additives, which are carefully blended to create a proprietary dispersion.

ESTIMATED SCHEDULE OF PROJECT

This is an initial three (3) year contract with options to extend the contract for two (2) additional one (1) year periods, with all terms and conditions remaining the same.

FISCAL INFORMATION

These products will be funded from Wastewater Operating funds. Requisitions will be entered on an as-needed basis. The budgeted amount for this item is $150,000. The City will only pay for services rendered and is not obligated to pay the full contract amount unless needed.

EXHIBITS

Exhibit 1: Agenda Information Sheet
Exhibit 2: Ordinance and Contract

Respectfully submitted:
Lori Hewell, 940-349-7100
Purchasing Manager

For information concerning this acquisition, contact: Mark Bartek, 940-349-8626.

Legal point of contact: Marcella Lunn at 940-349-8333.

ORDINANCE NO. _____

AN ORDINANCE OF THE CITY OF DENTON, A TEXAS HOME-RULE MUNICIPAL CORPORATION, AUTHORIZING THE CITY MANAGER TO EXECUTE A CONTRACT WITH T.H. GLENNON CO., INC., FOR THE PURCHASE OF MULCH COLORANT FOR THE BENEFICIAL REUSE DEPARTMENT; PROVIDING FOR THE EXPENDITURE OF FUNDS THEREFOR; AND PROVIDING AN EFFECTIVE DATE (RFP 8822 – AWARDED TO T.H. GLENNON CO., INC., FOR THREE (3) YEARS, WITH THE OPTION FOR TWO (2) ADDITIONAL ONE (1) YEAR EXTENSIONS, IN THE FIVE (5) YEAR NOT-TO-EXCEED AMOUNT OF $150,000.00).

WHEREAS, the City has solicited, received, and evaluated competitive proposals for the purchase of mulch colorant for the Beneficial Reuse Department; and

WHEREAS, the City Manager, or a designated employee, has received, reviewed, and recommended that the herein described proposals are the most advantageous to the City considering the relative importance of price and the other evaluation factors included in the request for proposals; and

WHEREAS, this procurement was undertaken as part of the City's governmental function; and

WHEREAS, the City Council has provided in the City Budget for the appropriation of funds to be used for the purchase of the materials, equipment, supplies, or services approved and accepted herein; NOW, THEREFORE,

THE COUNCIL OF THE CITY OF DENTON HEREBY ORDAINS:

SECTION 1. The items in the following numbered request for proposal for materials, equipment, supplies, or services shown in the "Request Proposals" on file in the office of the Purchasing Agent, are hereby accepted and approved as being the most advantageous to the City considering the relative importance of price and the other evaluation factors included in the request for proposals.

RFP NUMBER	CONTRACTOR	AMOUNT
8822	T.H. Glennon Co., Inc.	$150,000.00

SECTION 2. That by the acceptance and approval of the above numbered items of the submitted proposals, the City accepts the offer of the persons submitting the proposals for such items and agrees to purchase the materials, equipment, supplies, or services in accordance with the terms, specifications, standards, quantities, and for the specified sums contained in the Proposal Invitations, Proposals, and related documents.

SECTION 3. That should the City and person submitting approved and accepted items wish to enter into a formal written agreement as a result of the acceptance, approval, and awarding of the proposals, the City Manager, or their designated representative, is hereby authorized to execute the written contract which shall be attached hereto; provided that the written contract is in accordance with the terms, conditions, specifications, standards, quantities, and specified sums contained in the Proposal and related documents herein approved and accepted.

SECTION 4. The City Council of the City of Denton hereby expressly delegates the authority to take any actions that may be required or permitted to be performed by the City of Denton under this ordinance to the City Manager of the City of Denton, or their designee.

SECTION 5. By the acceptance and approval of the above enumerated bids, the City Council hereby authorizes the expenditure of funds therefor in the amount and in accordance with the approved bids.

SECTION 6. This ordinance shall become effective immediately upon its passage and approval.

The motion to approve this ordinance was made by _____ and seconded by _____. This ordinance was passed and approved by the following vote [___ - ___]:

	Aye	**Nay**	**Abstain**	**Absent**
Mayor Gerard Hudspeth:	_____	_____	_____	_____
Vicki Byrd, District 1:	_____	_____	_____	_____
Brian Beck, District 2:	_____	_____	_____	_____
Suzi Rumohr, District 3:	_____	_____	_____	_____
Joe Holland, District 4:	_____	_____	_____	_____
Brandon Chase McGee, At Large Place 5:	_____	_____	_____	_____
Jill Jester, At Large Place 6:	_____	_____	_____	_____

PASSED AND APPROVED this the _____ day of _____, 2025.

_____
GERARD HUDSPETH, MAYOR

ATTEST:
INGRID REX, CITY SECRETARY

BY: _____

APPROVED AS TO LEGAL FORM:
MACK REINWAND, CITY ATTORNEY

BY: Leah Bush

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Docusign City Council Transmittal Coversheet

RFP	8022
File Name	Compost Mulch Colorant
Purchasing Contact	Erica Garcia
City Council Target Date	
Piggy Back Option	No
Contract Expiration	
Ordinance	

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CONTRACT BY AND BETWEEN
CITY OF DENTON, TEXAS AND T.H. GLENNON CO., INC.
(Contract #8822)

THIS CONTRACT is made and entered into this date _____, by and between T.H. Glennon Co., Inc. a Massachusetts corporation, whose address 25 Fanaras Drive, Salisbury, MA 01952, hereinafter referred to as "Contractor," and the **CITY OF DENTON, TEXAS**, a home rule municipal corporation, hereinafter referred to as "City," to be effective upon approval of the Denton City Council and subsequent execution of this Contract by the Denton City Manager or their duly authorized designee.

For and in consideration of the covenants and agreements contained herein, and for the mutual benefits to be obtained hereby, the parties agree as follows:

SCOPE OF SERVICES

Contractor shall provide products in accordance with the City's RFP# 8822 Mulch Colorant a copy of which is on file at the office of Purchasing Agent and incorporated herein for all purposes. The Contract consists of this written agreement and the following items which are attached hereto, or on file, and incorporated herein by reference:

(a) Special Terms and Conditions **(Exhibit "A");**
(b) City of Denton's RFP# 8822 (the "Solicitation") **(Exhibit "B" on file at the office of the Purchasing Agent**);
(c) City of Denton Standard Terms and Conditions **(Exhibit "C");**
(d) Certificate of Interested Parties Electronic Filing **(Exhibit "D");**
(e) Contractor's Proposal ("Contractor's Offer") **(Exhibit "E")**;
(f) Form CIQ – Conflict of Interest Questionnaire **(Exhibit "F")**

These documents make up the Contract documents and what is called for by one shall be as binding as if called for by all. In the event of an inconsistency or conflict in any of the provisions of the Contract documents, the inconsistency or conflict shall be resolved by giving precedence first to the written agreement then to the contract documents in the order in which they are listed above. These documents shall be referred to collectively as "Contract Documents."

Prohibition on Contracts with Companies Boycotting Israel
Contractor acknowledges that in accordance with Chapter 2271 of the Texas Government Code, City is prohibited from entering into a contract with a company for goods or services unless the contract contains a written verification from the company that it: (1) does not boycott Israel; and (2) will not boycott Israel during the term of the contract. The terms "boycott Israel" and "company" shall have the meanings ascribed to those terms in Section 808.001 of the Texas Government Code. ***By signing this Contract, Contractor certifies that Contractor's signature provides written verification to the City that Contractor: (1) does not boycott Israel; and (2) will not boycott Israel during the term of the Contract.*** Failure to meet or maintain the requirements under this provision will be considered a material breach.

Prohibition on Contracts with Companies Boycotting Certain Energy Companies
Contractor acknowledges that in accordance with Chapter 2276 of the Texas Government Code, City is prohibited from entering into a contract with a company for goods or services unless the contract contains written verification from the company that it (1) does not boycott energy companies; and (2) will not boycott

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energy companies during the term of the contract. The terms "boycott energy company" and "company" shall have the meanings ascribed to those terms in Section 809.001 of the Texas Government Code. ***By signing this agreement, Contractor certifies that Contractor's signature provides written verification to the City that Contractor: (1) does not boycott energy companies; and (2) will not boycott energy companies during the term of the Contract.*** Failure to meet or maintain the requirements under this provision will be considered a material breach.

Prohibition on Contracts with Companies Boycotting Certain Firearm Entities and Firearm Trade Associations

Contractor acknowledges that in accordance with Chapter 2274 of the Texas Government Code, City is prohibited from entering into a contract with a company for goods or services unless the contract contains written verification from the company that it (1) does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association; and (2) will not discriminate during the term of the contract against a firearm entity or firearm trade association. The terms "discriminate against a firearm entity or firearm trade association," "firearm entity" and "firearm trade association" shall have the meanings ascribed to those terms in Chapter 2274 of the Texas Government Code. ***By signing this Contract, Contractor certifies that Contractor's signature provides written verification to the City that Contractor: (1) does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association; and (2) will not discriminate during the term of this Contract against a firearm entity or firearm trade association.*** Failure to meet or maintain the requirements under this provision will be considered a material breach.

Prohibition On Contracts with Companies Doing Business with Iran, Sudan, or a Foreign Terrorist Organization

Section 2252 of the Texas Government Code restricts City from contracting with companies that do business with Iran, Sudan, or a foreign terrorist organization. ***By signing this Contract, Contractor certifies that Contractor's signature provides written verification to the City that Contractor, pursuant to Chapter 2252, is not ineligible to enter into this Contract and will not become ineligible to receive payments under this Contract by doing business with Iran, Sudan, or a foreign terrorist organization***. Failure to meet or maintain the requirements under this provision will be considered a material breach.

Termination Right for Contracts with Companies Doing Business with Certain Foreign-Owned Companies

The City of Denton may terminate this Contract immediately without any further liability if the City of Denton determines, in its sole judgment, that this Contract meets the requirements under Chapter 2275, and Contractor is, or will be in the future, (i) owned by or the majority of stock or other ownership interest of the company is held or controlled by individuals who are citizens of China, Iran, North Korea, Russia, or other designated country (ii) directly controlled by the Government of China, Iran, North Korea, Russia, or other designated country, or (iii) is headquartered in China, Iran, North Korea, Russia, or other designated country.

The parties agree to transact business electronically. Any statutory requirements that certain terms be in writing will be satisfied using electronic documents and signing. Electronic signing of this document will be deemed an original for all legal purposes.

IN WITNESS WHEREOF, the parties of these presents have executed this Contract in the year and day first above written.

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CITY OF DENTON, TEXAS

BY: _____
SARA HENSLEY
CITY MANAGER

ATTEST:
, CITY SECRETARY

BY: _____

APPROVED AS TO LEGAL FORM:
MACK REINWAND, CITY ATTORNEY

BY: DocuSigned by: Marcella Lunn 4B070831B4AA438...

CONTRACTOR

BY: DocuSigned by: Brian R Shea 38AC64A5559543E...
AUTHORIZED SIGNATURE

Printed Name: Brian Shea

Title: President

978-465-7222
PHONE NUMBER

Brian@glennoncompany.com
EMAIL ADDRESS

_____
TEXAS ETHICS COMMISSION
CERTIFICATE NUMBER

THIS CONTRACT HAS BEEN
BOTH REVIEWED AND APPROVED
as to financial and operational obligations
and business terms.

Signed by: Stephen D Gay FEB48BB9726E4A9...
SIGNATURE

Stephen D Gay
PRINTED NAME

General Manager
TITLE

Water Utilities and Street Operations
DEPARTMENT

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Exhibit A
Special Terms and Conditions

1. The Quantities

The quantities indicated on Exhibit E are estimates based upon the best available information. The City reserves the right to increase or decrease the quantities to meet its actual needs without any adjustments in the bid price. Individual purchase orders will be issued on an as needed basis.

2. Product Changes During Contract Term

The Contractor shall not change specifications during the contract term without prior approval. Any deviation in the specifications or change in the product must be approved in advance by the City of Denton. Notice of a change shall be submitted in writing to purchasing@cityofdenton.com, with the above file number in the subject line, for review. Products found to have changed specifications without notification, and acceptance, will be returned at the contractor's expense. Products that have been installed will be replaced at the contractor's expense.

3. Authorized Distributor

The Contractor shall be the manufacturer or authorized distributor of the proposed products. The distributor shall be authorized to sell to the City of Denton, and make available the manufacturer's representative as needed by the City.

4. Contract Terms

The contract term will be three (3) year, effective from date of award. The City and the Contractor shall have the option to renew this contract for an additional two (2) one-year periods.

The Contract shall commence upon the issuance of a Notice of Award by the City of Denton and shall automatically renew each year, from the date of award by City Council. The Contractor's request to not renew the contract must be submitted in writing to the Purchasing Manager at least 60 days prior to the contract renewal date for each year. At the sole option of the City of Denton, the Contract may be further extended as needed, not to exceed a total of six (6) months.

5. Price Escalation and De-escalation

On Contractor's request in the form stated herein, the City will implement an escalation/de-escalation price adjustment annually based on these special terms. Any request for price adjustment must be based on the, U.S Department of Labor, Bureau of Labor Statistics, Producer Price Index (PPI) or the manufacturer published pricing list. The maximum escalation will not exceed +/- 8% for any individual year. The escalation will be determined annually at the renewal date. The price will be increased or decreased based upon the annual percentage change in the PPI or the percentage change in the manufacturer's price list. Should the PPI or manufacturer price list change exceed a minimum threshold value of +/-1%, then the stated eligible bid prices shall be adjusted in accordance with the percent change not to exceed the 8%

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limit per year. The Contractor should provide documentation as percentage of each cost associated with the unit prices quoted for consideration.

Request must be submitted in writing with supporting evidence for need of such increase to the Purchasing Manager at least 60 days prior to contract expiration of each year. Respondent must also provide supporting documentation as justification for the request. If no request is made, then it will be assumed that the current contract price will be in effect.

Upon receipt of such request, the City of Denton reserves the right to either: accept the escalation as competitive with the general market price at the time, and become effective upon the renewal date of the contract award or reject the increases within 30 calendar days after receipt of a properly submitted request. If a properly submitted increase is rejected, the Contractor may request cancellation of such items from the Contract by giving the City of Denton written notice. Cancellation will not go into effect for 15 calendar days after a determination has been issued. Pre-price increase prices must be honored on orders dated up to the official date of the City of Denton approval and/or cancellation.

The request can be sent by e-mail to: purchasing@cityofdenton.com noting the solicitation number.

The City of Denton reserves the right to accept, reject, or negotiate the proposed price changes.

6. Total Contract Amount

The contract total shall not exceed $150,000. Pricing shall be per Exhibit E attached.

7. Delivery Lead Time

Product or services shall be delivered to the City per the days/weeks noted in Exhibit E after receipt of the order.

8. Performance Liquidated Damages

The Contractor shall incur contractual payment losses, as initiated by the City for performance that falls short of specified performance standards as outlined below:

- Delivery beyond contracted lead times
- Performance below contracted levels (services only)

The Contractor shall be assessed a one (1%) percent fee each month when any one of the performance standards outlined above are not met in full. The Contractor shall be assessed a two (2%) percent profit fee each month when any two (2) or more performance standards outlined above are not met in full. At the end of each month, the City will review the monthly reports and determine the percentage of penalty to be assessed to the Contractor's monthly profit margin.

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Exhibit C
City of Denton
Standard Purchase Terms and Conditions

These standard Terms and Conditions and the Terms and Conditions, Specifications, Drawings and other requirements included in the City of Denton's contract are applicable to contracts/purchase orders issued by the City of Denton hereinafter referred to as the City or Buyer and the Seller or respondent herein after referred to as Contractor. Any deviations must be in writing and signed by a representative of the City's Procurement Department and the Contractor . No Terms and Conditions contained in the seller's proposal response, invoice, or statement shall serve to modify the terms set forth herein. If there is a conflict between the provisions on the face of the contract/purchase order these written provisions will take precedence.

The Contractor agrees that the Contract shall be governed by the following terms and conditions, unless exceptions are duly noted and fully negotiated. Unless otherwise specified in the Contract, Sections 3, 4, 5, 6, 7, 8, 20, and 21 shall apply only to a solicitation to purchase goods, and sections 9, 10, 11, and 22 shall apply only to a solicitation to purchase services to be performed principally at the City's premises or on public rights-of-way.

1. **CONTRACTOR'S OBLIGATIONS**. The Contractor shall fully and timely provide all deliverables described in the Solicitation and in the Contractor's Offer in strict accordance with the terms, covenants, and conditions of the Contract and all applicable federal, State, and local laws, rules, and regulations.

2. **EFFECTIVE DATE/TERM**. Unless otherwise specified in the Solicitation or Exhibit A, this Contract shall be effective as of the date this Contract is signed by the City and shall continue in effect until all obligations are performed in accordance with the Contract.

3. **CONTRACTOR TO PACKAGE DELIVERABLES**: The Contractor will package deliverables in accordance with good commercial practice and shall include a packing list showing the description of each item, the quantity and unit price unless otherwise provided in the Solicitation or Contractor's Offer, each shipping container shall be clearly and permanently marked as follows: (a) The Contractor's name and address, (b) the City's name, address, purchase order or purchase release number, and the price agreement number, if applicable, (c) container number and total number of containers, e.g. box 1 of 4 boxes, and (d) the number of the container bearing the packing list. The Contractor shall bear cost of packaging. Deliverables shall be suitably packed to secure lowest transportation costs and to conform to all the requirements of common carriers and any applicable specification. The City's count or weight shall be final and conclusive on shipments not accompanied by packing lists.

4. **SHIPMENT UNDER RESERVATION PROHIBITED**: The Contractor is not authorized to ship the deliverables under reservation and no tender of a bill of lading will operate as a tender of deliverables.

5. **TITLE & RISK OF LOSS**: Title to and risk of loss of the deliverables shall pass to the City only when the City actually receives and accepts the deliverables.

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6. **DELIVERY TERMS AND TRANSPORTATION CHARGES**: Deliverables shall be shipped F.O.B. point of delivery unless otherwise specified in the Solicitation or Contractor's Offer. Unless otherwise stated in the Contractor's Offer, the Contractor's price shall be deemed to include all delivery and transportation charges. The City shall have the right to designate what method of transportation shall be used to ship the deliverables. The place of delivery shall be that set forth in the purchase order.

7. **RIGHT OF INSPECTION AND REJECTION**: The City expressly reserves all rights under law, including, but not limited to the Uniform Commercial Code, to inspect the deliverables at delivery before accepting them, and to reject defective or non-conforming deliverables. If the City has the right to inspect the Contractor's, or the Contractor's Subcontractor's, facilities, or the deliverables at the Contractor's, or the Contractor's Subcontractor's, premises, the Contractor shall furnish, or cause to be furnished, without additional charge, all reasonable facilities and assistance to the City to facilitate such inspection.

8. **NO REPLACEMENT OF DEFECTIVE TENDER**: Every tender or delivery of deliverables must fully comply with all provisions of the Contract as to time of delivery, quality, and quantity. Any non-complying tender shall constitute a breach and the Contractor shall not have the right to substitute a conforming tender; provided, where the time for performance has not yet expired, the Contractor may notify the City of the intention to cure and may then make a conforming tender within the time allotted in the contract to perform but not afterward. If, instead of requiring immediate correction or removal and replacement of defective or non-conforming deliverables, the City prefers to accept it, the City may do so. The Contractor shall pay all claims, costs, losses and damages attributable to the City's evaluation of and determination to accept such defective or non-conforming deliverables. If any such acceptance occurs prior to final payment, the City may deduct such amounts as are necessary to compensate the City for the diminished value of the defective or non-conforming deliverables. If the acceptance occurs after final payment, such amount will be refunded to the City by the Contractor.

9. **PLACE AND CONDITION OF WORK**: This paragraph only applies to the purchase of services to be primarily performed at the City's premises or on City property/right-of-way. The City shall provide the Contractor access to the sites where the Contractor is to perform the services as required in order for the Contractor to perform the services in a timely and efficient manner, in accordance with and subject to the applicable security laws, rules, and regulations. The Contractor acknowledges that it has satisfied itself as to the nature of the City's service requirements and specifications, the location and essential characteristics of the work sites, the quality and quantity of materials, equipment, labor and facilities necessary to perform the services, and any other condition or state of fact which could in any way affect performance of the Contractor's obligations under the Contract. The Contractor hereby releases and holds the City harmless from and against any liability or claim for damages of any kind or nature if the actual site or service conditions differ from expected conditions.

The Contractor shall, at all times, exercise reasonable precautions for the safety of their employees, City Staff, participants and others on or near the City's facilities.

10. **WORKFORCE** This paragraph only applies to the purchase of services to be primarily performed at the City's premises or on City property/right-of-way.

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A. The Contractor shall employ only orderly and competent workers, skilled in the performance of the services which they will perform under the Contract.
B. The Contractor, its employees, Subcontractors, and Subcontractor's employees may not (1) while engaged in, participating, or responding to a solicitation; or (2) while in the course and scope of delivering goods or services under a City of Denton contract; or (3) on the City's property.

i. use or possess a firearm, including a concealed handgun that is licensed under State law, except as required by the terms of the contract; or

ii. use or possess alcoholic or other intoxicating beverages, illegal drugs, or controlled substances, nor may such workers be intoxicated, or under the influence of alcohol or drugs.

C. If the City or the City's representative notifies the Contractor that any worker is incompetent, disorderly or disobedient, has knowingly or repeatedly violated safety regulations, has possessed any firearms, or has possessed or was under the influence of alcohol or drugs, the Contractor shall immediately remove such worker from Contract services, and may not employ such worker again on Contract services without the City's prior written consent.

IMMIGRATION: THE CONTRACTOR REPRESENTS AND WARRANTS THAT IT SHALL COMPLY WITH THE REQUIREMENTS OF THE IMMIGRATION REFORM AND CONTROL ACT OF 1986 AND 1990 REGARDING EMPLOYMENT VERIFICATION AND RETENTION OF VERIFICATION FORMS FOR ANY INDIVIDUALS HIRED ON OR AFTER NOVEMBER 6, 1986, WHO WILL PERFORM ANY LABOR OR SERVICES UNDER THE CONTRACT AND THE ILLEGAL IMMIGRATION REFORM AND IMMIGRANT RESPONSIBILITY ACT OF 1996 ("IIRIRA) ENACTED ON SEPTEMBER 30, 1996, AND SHALL INDEMNIFY AND HOLD THE CITY HARMLESS FROM ANY ACTION ARISING RELATED THERETO.

11. **COMPLIANCE WITH HEALTH, SAFETY, AND ENVIRONMENTAL REGULATIONS**: This paragraph only applies to the purchase of services to be primarily performed at the City's premises or on City property/right-of-way. The Contractor, its Subcontractors, and their respective employees, shall comply fully with all applicable federal, state, and local health, safety, and environmental laws, ordinances, rules, and regulations in the performance of the services, including but not limited to those promulgated by the City and by the Occupational Safety and Health Administration (OSHA). In case of conflict, the most stringent safety requirement shall govern. **THE CONTRACTOR SHALL INDEMNIFY AND HOLD THE CITY HARMLESS FROM AND AGAINST ALL CLAIMS, DEMANDS, SUITS, ACTIONS, JUDGMENTS, FINES, PENALTIES AND LIABILITY OF EVERY KIND ARISING FROM THE BREACH OF THE CONTRACTOR'S OBLIGATIONS UNDER THIS PARAGRAPH.**

Environmental Protection: The Contractor shall be in compliance with all applicable standards, orders, or regulations issued pursuant to the mandates of the Clean Air Act (42 U.S.C. §7401 *et seq*.) and the Federal Water Pollution Control Act, as amended, (33 U.S.C. §1251 *et seq*.).

12. **INVOICES**:
A. The Contractor shall submit separate invoices on each purchase order or purchase release after each delivery. If partial shipments or deliveries are authorized by the City, a separate invoice must be sent for each shipment or delivery made.
B. **Proper Invoices must include a unique invoice number, invoice date, the purchase order number, and the master agreement number if applicable, the Department's Name, and the name of the point of contact for the Department**. Invoices shall be itemized and transportation charges, if any, shall be listed separately. A copy of the bill of lading and the freight waybill, when applicable, shall be attached to the invoice. The Contractor's name, remittance address and, if

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applicable, the tax identification number on the invoice must exactly match the information in the Vendor's registration with the City. Unless otherwise instructed in writing, the City may rely on the remittance address specified on the Contractor's invoice.

C. Invoices for labor shall include a copy of all time-sheets with trade labor rate and deliverables order number clearly identified. Invoices shall also include a tabulation of work-hours at the appropriate rates and grouped by work order number. Time billed for labor shall be limited to hours actually worked at the work site.

D. Unless otherwise expressly authorized in the Contract, the Contractor shall pass through all Subcontract and other authorized expenses at actual cost without markup.

E. Federal excise taxes, State taxes, or City sales taxes must not be included in the invoiced amount. The City will furnish a tax exemption certificate upon request.

13. **PAYMENT**:

A. All proper invoices need to be sent to Accounts Payable – accountspayable@cityofdenton.com. Approved invoices will be paid within thirty (30) calendar days of the invoice being received in Accounts Payable.

B. **If payment is not timely made, (per paragraph A); interest shall accrue on the unpaid balance at the lesser of the rate specified in Texas Government Code Section 2251.025 or the maximum lawful rate; except, if payment is not timely made for a reason for which the City may withhold payment hereunder, including, but not limited to, those in Paragraph D , below, interest shall not accrue until ten (10) calendar days after the grounds for withholding payment have been resolved.**

C. If partial shipments or deliveries are authorized by the City, the Contractor will be paid for the partial shipment or delivery, as stated above, provided that the invoice matches such shipment or delivery.

D. The City may withhold or set off the entire payment or part of any payment otherwise due to the Contractor to such extent as may be necessary on account of:

i. delivery of defective or non-conforming deliverables by the Contractor;

ii. third party claims, which are not covered by the insurance which the Contractor is required to provide, are filed or reasonable evidence indicating probable filing of such claims;

iii. failure of the Contractor to pay Subcontractors, or for labor, materials, or equipment;

iv. damage to the property of the City or the City's agents, employees, or contractors, which is not covered by insurance required to be provided by the Contractor;

v. reasonable evidence that the Contractor's obligations will not be completed within the time specified in the Contract, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;

vi. failure of the Contractor to submit proper invoices with purchase order number, all required attachments, and supporting documentation; or

vii. failure of the Contractor to comply with any material provision of the Contract Documents.

E. Notice is hereby given to any awarded firm who is in arrears to the City for delinquent taxes of any kind or otherwise indebted to the City that the City shall be entitled to counterclaim and/or offset against any such debt, claim, demand, or account owed to the City through payment withholding until the debt is paid in full, and no assignment of such debt, claim, demand, or account after the said taxes or debt are due shall affect the right of the City to offset the said taxes or debt against same.

F. Payment will be made by check unless the parties mutually agree to payment by credit card or

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electronic transfer of funds. The Contractor agrees that there shall be no additional charges, surcharges, or penalties to the City for payments made by credit card or electronic funds transfer.
G. The Contractor acknowledges and agrees that the awarding or continuation of this Contract is dependent upon the availability of funding. The City's payment obligations are payable only and solely from funds appropriated and available for this Contract. The absence of appropriated or other lawfully available funds shall render the Contract null and void to the extent funds are not appropriated or available and any deliverables delivered but unpaid shall be returned to the Contractor. The City will not incur a debt or obligation to pay Contractor any amounts the City does not have the current funds available to pay. The City shall provide the Contractor written notice of the failure of the City to make an adequate appropriation for any fiscal year to pay the amounts due under the Contract, or the reduction of any appropriation to an amount insufficient to permit the City to pay its obligations under the Contract. In the event of none or inadequate appropriation of funds, there will be no penalty or liability to the City, nor removal fees, cancellation fees, or the like charged to the City.

14. **TRAVEL EXPENSES**: All travel, lodging, and per diem expenses in connection with the Contract shall be paid by the Contractor, unless otherwise stated in the Contract Documents. During the term of this Contract, the Contractor shall bill and the City shall reimburse Contractor for all reasonable and approved out of pocket expenses which are incurred in the connection with the performance of duties hereunder. Notwithstanding the foregoing, expenses for the time spent by the Contractor in traveling to and from City facilities shall not be reimbursed, unless otherwise negotiated.

15. **FINAL PAYMENT AND CLOSE-OUT**:
A. If a DBE/MBE/WBE Program Plan is agreed to and the Contractor has identified Subcontractors, the Contractor is required to submit a Contract Close-Out MBE/WBE Compliance Report to the Purchasing Manager no later than the fifteenth (15^{th}) calendar day after completion of all work under the contract. Final payment, retainage, or both may be withheld if the Contractor is not in compliance with the requirements as accepted by the City.
B. The making and acceptance of final payment will constitute:

i. a waiver of all claims by the City against the Contractor, except claims (1) which have been previously asserted in writing and not yet settled, (2) arising from defective work appearing after final inspection, (3) arising from failure of the Contractor to comply with the Contract or the terms of any warranty specified herein, (4) arising from the Contractor's continuing obligations under the Contract, including but not limited to indemnity and warranty obligations, or (5) arising under the City's right to audit; and

ii. a waiver of all claims by the Contractor against the City other than those previously asserted in writing and not yet settled.

16. **SPECIAL TOOLS & TEST EQUIPMENT**: If the price stated on the Contractor's Offer includes the cost of any special tooling or special test equipment fabricated or required by the Contractor for the purpose of filling this order, such special tooling equipment and any process sheets related thereto shall become the property of the City and shall be identified by the Contractor as such.

17. **RIGHT TO AUDIT**:
A. The Contractor agrees that the City shall, until the expiration of five (5) years after final payment under this Contract unless required to be retained for longer under applicable law, have

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electronic access to and the right to examine all books, records, and computations pertaining to this Contract. If necessary, the City shall have the right to audit and make copies of the books, records, and computations pertaining to the Contract. The Contractor shall retain such books, records, documents, and other evidence pertaining to the Contract period and five (5) years thereafter, except if an audit is in progress or audit findings are yet unresolved, in which case records shall be kept until all audit tasks are completed and resolved. These books, records, documents, and other evidence shall be available, within ten (10) business days of written request. All books and records will be made available within a fifty (50) mile radius of the City of Denton if the vendor is not able to provide electronic access. The cost of the audit will be borne by the City unless the audit reveals an overpayment of 1% or greater. If an overpayment of 1% or greater occurs, the reasonable cost of the audit, including any travel costs, must be borne by the Contractor which must be payable within five (5) business days of receipt of an invoice.

B. The Contractor further agrees to include in all its subcontracts hereunder a provision to the effect that the Subcontractor, material supplier, or other payee agrees that the City shall, until the expiration of five (5) years after final payment under the subcontract unless required to be retained for longer under applicable law, have electronic access to and the right to examine all books, records, documents, and other evidence of the Subcontractor, material supplier, or other payee involving transactions relating to the subcontract. If necessary, the City maintains the right to photocopy any physical books, documents, papers, and records of the subconsultant involving transactions relating to the subcontract. All books and records will be made available within a fifty (50) mile radius of the City of Denton. The cost of the audit will be borne by the City unless the audit reveals an overpayment of 1% or greater. If an overpayment of 1% or greater occurs, the reasonable cost of the audit, including any travel costs, must be borne by the Contractor which must be payable within five (5) business days of receipt of an invoice.

C. Failure to comply with the provisions of this section shall be a material breach of the Contract and shall constitute, in the City's sole discretion, grounds for termination thereof. Each of the terms "books", "records", "documents", and "other evidence", as used above, shall be construed to include drafts and electronic files, even if such drafts or electronic files are subsequently used to generate or prepare a final printed document.

18. **SUBCONTRACTORS**:

A. If the Contractor-identified subcontractors ("Subcontractor") in a DBE/MBE/WBE agreed-to plan (the "Plan"), the Contractor shall comply with all requirements approved by the City. The Contractor shall not initially employ any subcontractor except as provided in the Contractor's Plan. The Contractor shall not substitute any Subcontractor identified in the Plan, unless the substitute has been accepted by the City in writing. No acceptance by the City of any subcontractor shall constitute a waiver of any rights or remedies of the City with respect to defective deliverables provided by a Subcontractor. If a Plan has been approved, the Contractor is additionally required to submit a monthly Subcontract Awards and Expenditures Report to the Procurement Manager, no later than the tenth calendar day of each month.

B. Work performed for the Contractor by a Subcontractor shall be pursuant to a written contract between the Contractor and Subcontractor. The terms of the subcontract may not conflict with the terms of the Contract Documents, and shall contain provisions that:

i. require that all deliverables to be provided by the Subcontractor be provided in strict accordance with the provisions, specifications and terms of the Contract;

ii. prohibit the Subcontractor from further subcontracting any portion of the Contract

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without the prior written consent of the City and the Contractor. The City may require, as a condition to such further subcontracting, that the Subcontractor post a payment bond in form, substance and amount acceptable to the City;

iii. require Subcontractors to submit all invoices and applications for payments, including any claims for additional payments, damages or otherwise, to the Contractor in sufficient time to enable the Contractor to include same with its invoice or application for payment to the City in accordance with the terms of the Contract;

iv. require that all Subcontractors obtain and maintain, throughout the term of their contract, insurance in the type and amounts specified for the Contractor, with the City being a named insured as its interest shall appear; and

v. require that the Subcontractor indemnify and hold the City harmless to the same extent as the Contractor is required to indemnify the City.

C. The Contractor shall be fully responsible to the City for all acts and omissions of the Subcontractors just as the Contractor is responsible for the Contractor's own acts and omissions. Nothing in the Contract shall create for the benefit of any such Subcontractor any contractual relationship between the City and any such Subcontractor, nor shall it create any obligation on the part of the City to pay or to see to the payment of any moneys due any such Subcontractor except as may otherwise be required by law.

D. The Contractor shall pay each Subcontractor its appropriate share of payments made to the Contractor not later than ten (10) calendar days after receipt of payment from the City.

19. **WARRANTY-PRICE**:

A. The Contractor warrants the prices quoted in the Contractor's Offer are no higher than the Contractor's current prices on orders by others for like deliverables under similar terms of purchase.

B. The Contractor certifies that the prices in the Contractor's Offer have been arrived at independently without consultation, communication, or agreement for the purpose of restricting competition, as to any matter relating to such fees with any other firm or with any competitor.

C. In the event Contractor breaches this warranty, in addition to any other remedy available, the City may deduct from any amounts owed to the Contractor, or otherwise recover, any amounts paid for items in excess of the Contractor's current prices on orders by others for like deliverables under similar terms of purchase, or in the alternative, the City may cancel this Contract without liability to Contractor for breach.

20. **WARRANTY – TITLE**: **The Contractor warrants that it has good and indefeasible title to all deliverables furnished under the Contract, and that the deliverables are free and clear of all liens, claims, security interests, and encumbrances. The Contractor shall indemnify and hold the City harmless from and against all adverse title claims to the deliverables.**

21. **WARRANTY – DELIVERABLES**: The Contractor warrants and represents that all deliverables sold the City under the Contract shall be free from defects in design, workmanship, or manufacture, and conform in all material respects to the specifications, drawings, and descriptions in the Contract Documents, to any samples furnished by the Contractor, to the terms, covenants, and conditions of the Contract, and to all applicable State, federal, or local laws, rules, and regulations, and industry codes and standards. Unless otherwise stated in the Solicitation, the deliverables shall be new or recycled merchandise, and not used or reconditioned. In addition, Contractor warrants that the goods sold to City shall conform to the standards promulgated by the

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U.S. Department of Labor under the Occupational Safety and Health Act (OSHA). In the event the product does not conform to OSHA standards, City may return the product for correction or replacement at the Contractor's expense. In the event Contractor fails to make the appropriate correction within a reasonable time, correction made by City will be at Contractor's expense.

A. Recycled deliverables shall be clearly identified as such.

B. The Contractor may not limit, exclude, or disclaim the foregoing warranty or any warranty implied by law; and any attempt to do so shall be without force or effect.

C. Unless otherwise specified in the Contract or required by the Solicitation, the warranty period shall be at least one (1) year from the date of acceptance of the deliverables or from the date of acceptance of any replacement deliverables. If during the warranty period, one or more of the above warranties are breached, the Contractor shall promptly upon receipt of demand either repair the non-conforming deliverables, or replace the non-conforming deliverables with fully conforming deliverables, at the City's option and at no additional cost to the City. All costs incidental to such repair or replacement, including but not limited to, any packaging and shipping costs shall be borne exclusively by the Contractor. The City shall endeavor to give the Contractor written notice of the breach of warranty within thirty (30) calendar days of discovery of the breach of warranty, but failure to give timely notice shall not impair the City's rights under this section.

D. If the Contractor is unable or unwilling to repair or replace defective or non-conforming deliverables as required by the City, then in addition to any other available remedy, the City may reduce the quantity of deliverables it may be required to purchase under the Contract from the Contractor, and purchase conforming deliverables from other sources. In such event, the Contractor shall pay to the City upon demand the increased cost, if any, incurred by the City to procure such deliverables from another source.

E. If the Contractor is not the manufacturer, and the deliverables are covered by a separate manufacturer's warranty, the Contractor shall transfer and assign such manufacturer's warranty to the City. If for any reason the manufacturer's warranty cannot be fully transferred to the City, the Contractor shall assist and cooperate with the City to the fullest extent to enforce such manufacturer's warranty for the benefit of the City.

F. Contractor shall not limit, exclude, or disclaim any implied warranties, and any attempt to do so shall be without force or effect, or alternatively, at the City's option, render this Contract voidable.

22. **WARRANTY – SERVICES**: The Contractor warrants and represents that all services to be provided to the City under the Contract will be fully and timely performed in a good and workmanlike manner in accordance with generally accepted industry standards and practices, the terms, conditions, and covenants of the Contract, and all applicable federal, State, and local laws, rules or regulations.

A. The Contractor may not limit, exclude, or disclaim the foregoing warranty or any warranty implied by law, and any attempt to do so shall be without force or effect, or alternatively, at the City's option, render this Contract voidable.

B. Unless otherwise specified in the Contract, the warranty period shall be at least one (1) year from the date of acceptance of the work. If during the warranty period, one or more of the above warranties are breached, the Contractor shall promptly upon receipt of demand perform the services again in accordance with above standard at no additional cost to the City. All costs incidental to such additional performance shall be borne by the Contractor. The City shall endeavor to give the Contractor written notice of the breach of warranty within thirty (30) calendar days of discovery of the breach warranty, but failure to give timely notice shall not impair the City's rights under this section.

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C. If the Contractor is unable or unwilling to perform its services in accordance with the above standard as required by the City, then in addition to any other available remedy, the City may reduce the amount of services it may be required to purchase under the Contract from the Contractor, and purchase conforming services from other sources. In such event, the Contractor shall pay to the City upon demand the increased cost, if any, incurred by the City to procure such services from another source.

23. **ACCEPTANCE OF INCOMPLETE OR NON-CONFORMING DELIVERABLES**: If, instead of requiring immediate correction or removal and replacement of defective or non-conforming deliverables, the City prefers to accept it, the City may do so. The Contractor shall pay all claims, costs, losses, and damages attributable to the City's evaluation of and determination to accept such defective or non-conforming deliverables. If any such acceptance occurs prior to final payment, the City may deduct such amounts as are necessary to compensate the City for the diminished value of the defective or non-conforming deliverables. If the acceptance occurs after final payment, such amount will be refunded to the City by the Contractor.

24. **RIGHT TO ASSURANCE**: Whenever one party to the Contract in good faith has reason to question the other party's intent to perform, demand may be made to the other party for written assurance of the intent to perform. In the event that no assurance is given within the time specified (being a minimum of 5 days) after demand is made, the demanding party may treat this failure as an anticipatory repudiation of the Contract.

25. **STOP WORK NOTICE**: The City may issue an immediate Stop Work Notice in the event the Contractor is observed performing in a manner that is in violation of federal, State, or local guidelines, or in a manner that is determined by the City to be unsafe to either life or property. Upon notification, the Contractor will cease all work until notified by the City that the violation or unsafe condition has been corrected. The Contractor shall be liable for all costs incurred by the City as a result of the issuance of such Stop Work Notice.

26. **DEFAULT**:
A. The Contractor shall be in default under the Contract if the Contractor (a) fails to fully, timely, and faithfully perform any of its material obligations under the Contract, (b) fails to provide adequate assurance of performance under Paragraph 25, (c) becomes insolvent or seeks relief under the bankruptcy laws of the United States or (d) makes a material misrepresentation in Contractor's Offer, or in any report or deliverable required to be submitted by the Contractor to the City.
B. In the event the City terminates the awarded contract for default or any other reason, the Contractor shall not be relieved of liability to the City for damages sustained by the City by reason of any default of the contract by the Contractor or otherwise, and the City may withhold any payments to the Contractor for the purpose of an offset until such time as the amount of damages due the City from the Contractor can be determined.

27. **TERMINATION FOR CAUSE:** In the event of a default by the Contractor, the City shall have the right to terminate the Contract for cause, by written notice effective ten (10) calendar days, unless otherwise specified, after the date of such notice, unless the Contractor, within such ten (10) day period, cures such default, or provides evidence sufficient to prove to the City's reasonable satisfaction that such default does not, in fact, exist. In addition to any other remedy available under law or in equity, the City shall be entitled to recover all actual damages, costs,

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losses and expenses, incurred by the City as a result of the Contractor's default, including, without limitation, cost of cover, reasonable attorneys' fees, court costs, and prejudgment and post-judgment interest at the maximum lawful rate. Additionally, in the event of a default by the Contractor, the City may remove the Contractor from the City's vendor list for three (3) years and/or any offer submitted by the Contractor may be disqualified for up to three (3) years. All rights and remedies under the Contract are cumulative and are not exclusive of any other right or remedy provided by law. The requirements of Subchapter J, Chapter 552 of the Texas Government Code, may apply to this Contract and the Contractor agrees that the Contract can be terminated if the Contractor knowingly or intentionally fails to comply with a requirement of that subchapter.

28. **TERMINATION WITHOUT CAUSE**: The City shall have the right to terminate the Contract, in whole or in part, without cause and/or for convenience any time upon thirty (30) calendar days' prior written notice. Upon receipt of a notice of termination, the Contractor shall promptly cease all further work pursuant to the Contract, with such exceptions, if any, specified in the notice of termination. The City shall pay the Contractor, to the extent of funds appropriated or otherwise legally available for such purposes, for all goods delivered and services performed and obligations incurred prior to the date of termination in accordance with the terms hereof, provided such payment amount is not disputed by City. The City reserves all rights, causes of action, and remedies available under law or in equity with respect to any dispute under this Contract and a termination under this provision does not waive such rights, causes of action, and remedies.

29. **FRAUD**: Fraudulent statements by the Contractor in any offer, Contract Document, or in any report or deliverable required to be submitted by the Contractor to the City shall be grounds for the termination of the Contract for cause by the City and may result in legal action.

30. **DELAYS**:

A. The City may delay scheduled delivery or other due dates by written notice to the Contractor if the City deems it is in its best interest. If such delay causes an increase in the cost of the work under the Contract, the City and the Contractor shall negotiate an equitable adjustment for costs incurred by the Contractor in the Contract price and execute an amendment to the Contract. The Contractor must assert its right to an adjustment within thirty (30) calendar days from the date of receipt of the notice of delay. Failure to agree on any adjusted price shall be handled under the Dispute Resolution process specified in Paragraph 53. However, nothing in this provision shall excuse the Contractor from delaying the delivery as notified.

B. Neither party shall be liable for any default or delay in the performance of its obligations under this Contract if, while and to the extent such default or delay is caused by acts of God, fire, riots, civil commotion, labor disruptions, sabotage, sovereign conduct, or any other cause beyond the reasonable control of such party. In the event of default or delay in Contract performance due to any of the foregoing causes, then the time for completion of the services will be extended; provided, however, in such an event, a conference will be held within three (3) business days to establish a mutually agreeable period of time reasonably necessary to overcome the effect of such failure to perform.

31. **TIME OF COMPLETION AND LIQUIDATED DAMAGES**: Contractor agrees and acknowledges that completing the services and/or delivering the goods described in this Contract in a timely manner is very important to the City. Contractor agrees to perform all obligations within the timeframes required. As it is impracticable and extremely difficult to fix the actual damages, if any, that may proximately result from a failure by Contractor to provide the goods or

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perform the service, should Contractor fail to timely perform its obligations, Contractor agrees to pay to City, or have withheld and offset from monies due it, the amount stated in the Contract Documents as liquidated damages for each calendar day of delay or nonperformance. Any sums due and payable hereunder by the Contractor shall be payable, not as a penalty, but as liquidated damages representing an estimate of delay damages likely to be sustained by the City, estimated at the time of executing this Contract. Execution of the Contract shall constitute agreement by the City and Contractor that said amount is the minimum value of the costs and actual damage caused by the Contractor's failure to timely perform. Adjustments to the contract times can only be made as provided in the Contract Documents and any conditions or specifications referenced therein.

32. **INDEMNITY**:

A. Definitions:

i. "Indemnified Claims" shall include any and all claims, demands, suits, causes of action, judgments, and liability of every character, type, or description, including all reasonable costs and expenses of litigation, mediation, or other alternate dispute resolution mechanism, including attorney and other professional fees for: (1) damage to or loss of the property of any person (including, but not limited to the City, the Contractor, their respective agents, officers, employees and Subcontractors; the officers, agents, and employees of such Subcontractors; and third parties); and/or (2) death, bodily injury, illness, disease, worker's compensation, loss of services, or loss of income or wages to any person (including but not limited to the agents, officers and employees of the City, the Contractor, the Contractor's Subcontractors, and third parties), ii. "Fault" shall include the sale of defective or non-conforming deliverables, negligence, willful misconduct or a breach of any legally imposed strict liability standard.

B. **THE CONTRACTOR SHALL DEFEND (AT THE OPTION OF THE CITY), INDEMNIFY, AND HOLD THE CITY, ITS SUCCESSORS, ASSIGNS, OFFICERS, EMPLOYEES AND ELECTED OFFICIALS HARMLESS FROM AND AGAINST ALL INDEMNIFIED CLAIMS DIRECTLY ARISING OUT OF, INCIDENT TO, CONCERNING OR RESULTING FROM THE FAULT OF THE CONTRACTOR, OR THE CONTRACTOR'S AGENTS, EMPLOYEES OR SUBCONTRACTORS, IN THE PERFORMANCE OF THE CONTRACTOR'S OBLIGATIONS UNDER THE CONTRACT. NOTHING HEREIN SHALL BE DEEMED TO LIMIT THE RIGHTS OF THE CITY OR THE CONTRACTOR (INCLUDING, BUT NOT LIMITED TO, THE RIGHT TO SEEK CONTRIBUTION) AGAINST ANY THIRD PARTY WHO MAY BE LIABLE FOR AN INDEMNIFIED CLAIM.**

33. **LIMITATION OF LIABILITY**: This Contract does not, and shall not be interpreted to, contain an artificial limitation of liability (e.g. liability limited to contract price or liability capped at an amount actually paid in previous 3 months, etc.) or an artificial statute of limitations (e.g. any lawsuit must be commenced within one year of the event).

34. **INSURANCE**: The Contractor shall procure and maintain insurance of the types and in the minimum amounts acceptable to the City of Denton outlined in the Insurance Exhibit attached hereto, if applicable. The insurance shall be written by a company licensed to do business in the State of Texas and satisfactory to the City of Denton. The City of Denton reserves the right to add insurance during the contract term.

B. Specific Coverage Requirements: Specific insurance requirements are contained in the

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Solicitation and the Insurance Exhibit.

35. **CLAIMS**: If any claim, demand, suit, or other action is asserted against the Contractor which arises under or concerns the Contract, or which could have a material adverse effect on the Contractor's ability to perform thereunder, the Contractor shall give written notice thereof to the City within ten (10) calendar days after receipt of notice by the Contractor. Such notice to the City shall state the date of notification of any such claim, demand, suit, or other action; the names and addresses of the claimant(s); the basis thereof; and the name of each person against whom such claim is being asserted. Such notice shall be delivered personally or by mail and shall be sent to the City and to the Denton City Attorney. Personal delivery to the City Attorney shall be to City Hall, 215 East McKinney Street, Denton, Texas 76201.

36. **NOTICES**: Unless otherwise specified, all notices, requests, or other communications required or appropriate to be given under the Contract shall be in writing and shall be deemed delivered three (3) business days after postmarked if sent by U.S. Postal Service Certified or Registered Mail, Return Receipt Requested. Notices delivered by other means shall be deemed delivered upon receipt by the addressee. Routine communications may be made by first class mail, telefax, or other commercially accepted means. Notices to the Contractor shall be sent to the address specified in the Contractor's Offer, or at such other address as a party may notify the other in writing. Notices to the City shall be addressed to the City at 901B Texas Street, Denton, Texas 76209 and marked to the attention of the Purchasing Manager.

37. **RIGHTS TO BID, PROPOSAL AND CONTRACTUAL MATERIAL**: All material submitted by the Contractor to the City shall become property of the City upon receipt. Any portions of such material claimed by the Contractor to be proprietary must be clearly marked as such. Determination of the public nature of the material is subject to the Texas Public Information Act, Chapter 552, and Texas Government Code. The requirements of Subchapter J, Chapter 552 of the Texas Government Code, may apply to this Contract and the Contractor agrees that the Contract can be terminated if the Contractor knowingly or intentionally fails to comply with a requirement of that subchapter.

38. **INDEMNIFICATION AGAINST INFRINGEMENTS**: The Contractor represents and warrants to the City that: (i) the Contractor shall provide the City good and indefeasible title to the deliverables and (ii) the deliverables supplied by the Contractor in accordance with the specifications in the Contract will not infringe, directly or contributorily, any patent, trademark, copyright, trade secret, or any other intellectual property right of any kind of any third party; that no claims have been made by any person or entity with respect to the ownership or operation of the deliverables and the Contractor does not know of any valid basis for any such claims. Moreover, Contractor does not know of any valid basis for any such claims. **THE CONTRACTOR SHALL, AT ITS SOLE EXPENSE, DEFEND, INDEMNIFY, AND HOLD THE CITY HARMLESS FROM AND AGAINST ALL LIABILITY, DAMAGES, AND COSTS (INCLUDING COURT COSTS AND REASONABLE FEES OF ATTORNEYS AND OTHER PROFESSIONALS) ARISING OUT OF OR RESULTING FROM: (I) ANY CLAIM THAT THE CITY'S EXERCISE ANYWHERE IN THE WORLD OF THE RIGHTS ASSOCIATED WITH THE CITY'S' OWNERSHIP, AND IF APPLICABLE, LICENSE RIGHTS, AND ITS USE OF THE DELIVERABLES INFRINGES THE INTELLECTUAL PROPERTY RIGHTS OF ANY THIRD PARTY; OR (II) THE CONTRACTOR'S BREACH OF ANY OF CONTRACTOR'S REPRESENTATIONS OR WARRANTIES STATED IN THIS CONTRACT. IN THE EVENT OF ANY SUCH CLAIM, THE CITY SHALL HAVE THE**

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RIGHT TO MONITOR SUCH CLAIM OR AT ITS OPTION ENGAGE ITS OWN SEPARATE COUNSEL TO ACT AS CO-COUNSEL ON THE CITY'S BEHALF. FURTHER, CONTRACTOR AGREES THAT THE CITY'S SPECIFICATIONS REGARDING THE DELIVERABLES SHALL IN NO WAY DIMINISH CONTRACTOR'S WARRANTIES OR OBLIGATIONS UNDER THIS PARAGRAPH AND THE CITY MAKES NO WARRANTY THAT THE PRODUCTION, DEVELOPMENT, OR DELIVERY OF SUCH DELIVERABLES WILL NOT IMPACT SUCH WARRANTIES OF CONTRACTOR. THIS PARAGRAPH SHALL SURVIVE THE TERMINATION OF THIS CONTRACT.

39. **CONFIDENTIALITY**: In order to provide the deliverables to the City, Contractor may require access to certain of the City's and/or its licensors' confidential information (including inventions, employee information, trade secrets, confidential know-how, confidential business information, and other information which the City or its licensors consider confidential) (collectively, "Confidential Information"). Contractor acknowledges and agrees that the Confidential Information is the valuable property of the City and/or its licensors and any unauthorized use, disclosure, dissemination, or other release of the Confidential Information will substantially injure the City and/or its licensors. The Contractor (including its employees, subcontractors, agents, or representatives) agrees that it will maintain the Confidential Information in strict confidence and shall not disclose, disseminate, copy, divulge, recreate, or otherwise use the Confidential Information without the prior written consent of the City or in a manner not expressly permitted under this Contract, unless the Confidential Information is required to be disclosed by law or an order of any court or other governmental authority with proper jurisdiction, provided the Contractor promptly notifies the City before disclosing such information so as to permit the City reasonable time to seek an appropriate protective order. The Contractor agrees to use protective measures no less stringent than the Contractor uses within its own business to protect its own most valuable information, which protective measures shall under all circumstances be at least reasonable measures to ensure the continued confidentiality of the Confidential Information.

40. **OWNERSHIP AND USE OF DELIVERABLES**: The City shall own all rights, titles, and interests throughout the world in and to the deliverables.

A. Patents. As to any patentable subject matter contained in the deliverables, the Contractor agrees to disclose such patentable subject matter to the City. Further, if requested by the City, the Contractor agrees to assign and, if necessary, cause each of its employees to assign the entire right, title, and interest to specific inventions under such patentable subject matter to the City and to execute, acknowledge, and deliver and, if necessary, cause each of its employees to execute, acknowledge, and deliver an assignment of letters patent, in a form to be reasonably approved by the City, to the City upon request by the City.

B. Copyrights. As to any deliverables containing copyrightable subject matter, the Contractor agrees that upon their creation, such deliverables shall be considered as work made-for-hire by the Contractor for the City and the City shall own all copyrights in and to such deliverables, provided however, that nothing in this Paragraph 41 shall negate the City's sole or joint ownership of any such deliverables arising by virtue of the City's sole or joint authorship of such deliverables. Should by operation of law, such deliverables not be considered works made-for-hire, the Contractor hereby assigns to the City (and agrees to cause each of its employees providing services to the City hereunder to execute, acknowledge, and deliver an assignment to the City of) all worldwide right, title, and interest in and to such deliverables. With respect to such work made-for-hire, the Contractor agrees to execute, acknowledge, and deliver and cause each of its employees providing services to the City hereunder to execute, acknowledge, and deliver a work-made-for-hire agreement, in a form to be reasonably approved by the City, to the City upon

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delivery of such deliverables to the City or at such other time as the City may request.
C. Additional Assignments. The Contractor further agrees to, and if applicable, cause each of its employees to, execute, acknowledge, and deliver all applications, specifications, oaths, assignments, and all other instruments which the City might reasonably deem necessary in order to apply for and obtain copyright protection, mask work registration, trademark registration and/or protection, letters patent, or any similar rights in any and all countries and in order to assign and convey to the City, its successors, assigns and nominees, the sole and exclusive right, title, and interest in and to the deliverables. The Contractor's obligations to execute, acknowledge, and deliver (or cause to be executed, acknowledged, and delivered) instruments or papers such as those described in this Paragraph 41 A., B., and C. shall continue after the termination of this Contract with respect to such deliverables. In the event the City should not seek to obtain copyright protection, mask work registration or patent protection for any of the deliverables, but should desire to keep the same secret, the Contractor agrees to treat the same as Confidential Information under the terms of Paragraph 40 above.

41. **PUBLICATIONS**: All published material and written reports submitted under the Contract must be originally developed material unless otherwise specifically provided in the Contract. When material not originally developed is included in a report in any form, the source shall be identified.

42. **ADVERTISING**: The Contractor shall not advertise or publish, without the City's prior consent, the fact that the City has entered into the Contract, except to the extent necessary to comply with proper requests for information from an authorized representative of the federal, State, or local government.

43. **NO CONTINGENT FEES**: The Contractor warrants that no person or selling agency has been employed or retained to solicit or secure the Contract upon any agreement or understanding for commission, percentage, brokerage, or contingent fee, excepting bona fide employees of bona fide established commercial or selling agencies maintained by the Contractor for the purpose of securing business. For breach or violation of this warranty, the City shall have the right, in addition to any other remedy available, to cancel the Contract without liability and to deduct from any amounts owed to the Contractor, or otherwise recover, the full amount of such commission, percentage, brokerage or contingent fee.

44. **GRATUITIES**: The City may, by written notice to the Contractor, cancel the Contract without liability if it is determined by the City that gratuities were offered or given by the Contractor or any agent or representative of the Contractor to any officer or employee of the City of Denton with a view toward securing the Contract or securing favorable treatment with respect to the awarding or amending or the making of any determinations with respect to the performing of such contract. In the event the Contract is canceled by the City pursuant to this provision, the City shall be entitled, in addition to any other rights and remedies, to recover or withhold the amount of the cost incurred by the Contractor in providing such gratuities.

45. **PROHIBITION AGAINST PERSONAL INTEREST IN CONTRACTS**: The Contractor agrees to comply with the conflict of interest provisions of the City of Denon Code of Ordinances and/or State law. No officer, employee, independent consultant, or elected official of the City who is involved in the development, evaluation, or decision-making process of the performance of any solicitation shall have a financial interest, direct or indirect, in the Contract resulting from that

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solicitation as defined in the City's Ethic Ordinance codified at Chapter 2, Article XI and in the City Charter Section 14.04, as amended. Any willful violation of this section shall constitute impropriety in office, and any officer or employee guilty thereof shall be subject to disciplinary action up to and including dismissal. Any violation of this provision, with the knowledge, expressed or implied, of the Contractor shall render the Contract voidable by the City. The Contractor shall complete and submit the City's Conflict of Interest Questionnaire. The Contractor agrees to maintain current, updated disclosure of information on file with the Procurement Department throughout the term of this Contract.

46. **NO SUBCONTRACTING BID AFTER AWARD**: Following the award of the Contract, no subcontracting except that specifically identified in the response to the Solicitation will be permitted without the express prior written consent of the City.

47. **NO GIFT OF PUBLIC PROPERTY**: The City will not agree to any terms or conditions that cause the City to lend its credit or grant public money or anything of value to the selected Contractor.

48. **INDEPENDENT CONTRACTOR**: The Contract shall not be construed as creating an employer/employee relationship, a partnership, or a joint venture. The Contractor's services shall be those of an independent contractor. The Contractor agrees and understands that the Contract does not grant any rights or privileges established for employees of the City of Denton, Texas for the purposes of income tax, withholding, social security taxes, vacation or sick leave benefits, worker's compensation, or any other City employee benefit. The City shall not have supervision and control of the Contractor or any employee of the Contractor, and it is expressly understood that Contractor shall perform the services hereunder according to the attached specifications at the general direction of the City Manager of the City of Denton, Texas, or their designee under this Contract. The Contractor is expressly free to advertise and perform services for other parties while performing services for the City.

49. **ASSIGNMENT-DELEGATION**: The Contract shall be binding upon and enure to the benefit of the City and the Contractor and their respective successors and assigns, provided however, that no right or interest in the Contract shall be assigned and no obligation shall be delegated by the Contractor without the prior written consent of the City. Any attempted assignment or delegation by the Contractor shall be void unless made in conformity with this Paragraph. The Contract is not intended to confer rights or benefits on any person, firm or entity not a party hereto; it being the intention of the parties that there are no third party beneficiaries to the Contract.
The Vendor shall notify the City's Purchasing Manager, in writing, of a company name, ownership, or address change for the purpose of maintaining updated City records. The president of the company or authorized official must sign the letter. A letter indicating changes in a company name or ownership must be accompanied with supporting legal documentation such as an updated W-9, documents filed with the state indicating such change, copy of the board of director's resolution approving the action, or an executed merger or acquisition agreement. Failure to do so may adversely impact future invoice payments.

50. **WAIVER**: No claim or right arising out of a breach of the Contract can be discharged in whole or in part by a waiver or renunciation of the claim or right unless the waiver or renunciation is supported by consideration and is in writing signed by the aggrieved party. No waiver by either

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the Contractor or the City of any one or more events of default by the other party shall operate as, or be construed to be, a permanent waiver of any rights or obligations under the Contract, or an express or implied acceptance of any other existing or future default or defaults, whether of a similar or different character. No delay, failure, or waiver of either party's exercise or partial exercise of any right or remedy under the Contract shall operate to limit, impair, preclude, cancel, waive or otherwise affect such right or remedy.

51. **MODIFICATIONS**: The Contract can be modified or amended only by a writing signed by both parties. No pre-printed or similar terms on any the Contractor invoice, order or other document submitted to the City by Contractor shall have any force or effect to change the terms, covenants, and conditions of the Contract.

52. **INTERPRETATION**: The Contract is intended by the parties as a final, complete and exclusive statement of the terms of their agreement. No course of prior dealing between the parties or course of performance or usage of the trade shall be relevant to supplement or explain any term used in the Contract. Acceptance or acquiescence in a course of performance rendered under this Contract shall not be relevant to determine the meaning of this agreement even though the accepting or acquiescing party has knowledge of the performance and opportunity for objection. Although the Contract may have been substantially drafted by one party, it is the intent of the parties that all provisions be construed in a manner to be fair to both parties, reading no provisions more strictly against one party or the other. Whenever a term defined by the Uniform Commercial Code, as enacted by the State of Texas, is used in the Contract, the UCC definition shall control, unless otherwise defined in the Contract.

53. **DISPUTE RESOLUTION**:

A. If a dispute arises out of or relates to the Contract, or the breach thereof, the parties agree to negotiate prior to prosecuting a suit for damages. However, this section does not prohibit the filing of a lawsuit to toll the running of a statute of limitations or to seek injunctive relief. Either party may make a written request for a meeting between representatives of each party within fourteen (14) calendar days after receipt of the request or such later period as agreed by the parties. Each party shall include, at a minimum, one (1) senior level individual with decision-making authority regarding the dispute, however any decision requiring approval of the City Council of the City will be required to be submitted to the City Council and the senior level person shall have authority to recommend approval of any resolution. The purpose of this and any subsequent meeting is to attempt in good faith to negotiate a resolution of the dispute. If, within thirty (30) calendar days after such meeting, the parties have not succeeded in negotiating a resolution of the dispute, they will proceed directly to mediation as described below. Negotiation may be waived by a written agreement signed by both parties, in which event the parties may proceed directly to mediation as described below.

B. If the efforts to resolve the dispute through negotiation fail, or the parties waive the negotiation process, the parties may select, within thirty (30) calendar days, a mediator trained in mediation skills to assist with resolution of the dispute. Should they choose this option; the City and the Contractor agree to act in good faith in the selection of the mediator and to give consideration to qualified individuals nominated to act as mediator. Nothing in the Contract prevents the parties from relying on the skills of a person who is trained in the subject matter of the dispute or a contract interpretation expert. If the parties fail to agree on a mediator within thirty (30) calendar days of initiation of the mediation process, the mediator shall be selected by the Denton County Alternative Dispute Resolution Program (DCAP). The parties agree to participate in mediation in good faith

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for up to thirty (30) calendar days from the date of the first mediation session. The City and the Contractor will share the mediator's fees equally and the parties will bear their own costs of participation such as fees for any consultants or attorneys they may utilize to represent them or otherwise assist them in the mediation.
C. The parties shall not be required to submit to binding arbitration.

54. **JURISDICTION AND VENUE**: The Contract is made under and shall be governed by the laws of the State of Texas, including, when applicable, the Uniform Commercial Code as adopted in Texas, V.T.C.A., Bus. & Comm. Code, Chapter 1, excluding any rule or principle that would refer to and apply the substantive law of another state or jurisdiction. All issues arising from this Contract shall be resolved in the courts of Denton County, Texas and the parties agree to submit to the exclusive personal jurisdiction of such courts. The foregoing, however, shall not be construed or interpreted to limit or restrict the right or ability of the City to seek and secure injunctive relief from any competent authority as contemplated herein.

55. **INVALIDITY**: The invalidity, illegality, or unenforceability of any provision of the Contract shall in no way affect the validity or enforceability of any other portion or provision of the Contract. Any void provision shall be deemed severed from the Contract and the balance of the Contract shall be construed and enforced as if the Contract did not contain the particular portion or provision held to be void. The parties further agree to reform the Contract to replace any stricken provision with a valid provision that comes as close as possible to the intent of the stricken provision. The provisions of this section shall not prevent this entire Contract from being void should a provision which is the essence of the Contract be determined to be void.

56. **HOLIDAYS:** The following holidays are observed by the City:

New Year's Day (observed)
Martin Luther King, Jr. Day
Memorial Day
Juneteenth
Independence Day
Labor Day
Veteran's Day
Thanksgiving Day
Friday After Thanksgiving
Christmas Eve (observed)
Christmas Day (observed)

If a Legal Holiday falls on Saturday, it will be observed on the preceding Friday. If a Legal Holiday falls on Sunday, it will be observed on the following Monday. Normal hours of operation shall be between 8:00 am and 4:00 pm, Monday through Friday, excluding City of Denton Holidays. Any scheduled deliveries or work performance not within the normal hours of operation **must be approved** by the City Manager of Denton, Texas or their authorized designee.

57. **SURVIVABILITY OF OBLIGATIONS:** All provisions of the Contract that impose continuing obligations on the parties, including but not limited to the warranty, indemnity, and confidentiality obligations of the parties, shall survive the expiration or termination of the Contract for fifteen (15) years.

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58. **NON-SUSPENSION OR DEBARMENT CERTIFICATION:**
The City of Denton is prohibited from contracting with or making prime or sub-awards to parties that are suspended or debarred or whose principals are suspended or debarred from Federal, State, or City of Denton Contracts. By accepting a Contract with the City, the Vendor certifies that its firm and its principals are not currently suspended or debarred from doing business with the Federal Government, as indicated by the General Services Administration List of Parties Excluded from Federal Procurement and Non-Procurement Programs, the State of Texas, or the City of Denton.

59. **EQUAL OPPORTUNITY** Contractor agrees that during the performance of its contract it will:
A. Treat all applicants and employees without discrimination as to race, color, religion, sex, national origin, marital status, age, or handicap.
B. Identify itself as an "Equal Opportunity Employer" in all help wanted advertising or request. The Contractor shall be advised of any complaints filed with the City alleging that Contractor is not an Equal Opportunity Employer. The City reserves the right to consider its reports from its human relations administrator in response to such complaints in determining whether or not to terminate any portion of this contract for which purchase orders or authorities to deliver have not been included, however, the Contractor is specifically advised that no Equal Opportunity Employment complaint will be the basis for cancellation of this contract for which a purchase order has been issued or authority to deliver granted.
C. **Americans with Disabilities Act (ADA) Compliance:** No Contractor, or Contractor's agent, shall engage in any discriminatory employment practice against individuals with disabilities as defined
in the ADA.

60. **BUY AMERICAN ACT-SUPPLIES (Applicable to certain federally funded requirements)**
The following federally funded requirements are applicable. A. Definitions. As used in this paragraph –
i. "Component" means an article, material, or supply incorporated directly into an end product.
ii. "Cost of components" means -
(1) For components purchased by the Contractor, the acquisition cost, including transportation costs to the place of incorporation into the end product (whether or not such costs are paid to a domestic firm), and any applicable duty (whether or not a duty-free entry certificate is issued); or
(2) For components manufactured by the Contractor, all costs associated with the manufacture of the component, including transportation costs as described in paragraph (1) of this definition, plus allocable overhead costs, but excluding profit. Cost of components does not include any costs associated with the manufacture of the end product.
iii. "Domestic end product" means-
(1) An unmanufactured end product mined or produced in the United States; or
(2) An end product manufactured in the United States, if the cost of its components mined, produced, or manufactured in the United States exceeds 50 percent of the cost of all its components. Components of foreign origin of the same class or kind as those that the agency determines are not mined, produced, or manufactured in sufficient and reasonably available commercial quantities of a satisfactory quality are treated as domestic. Scrap generated, collected, and prepared for processing in the United States is considered domestic.

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iv. “End product” means those articles, materials, and supplies to be acquired under the contract for public use.
v. “Foreign end product” means an end product other than a domestic end product.
vi. “United States” means the 50 States, the District of Columbia, and outlying areas.
B. The Buy American Act (41 U.S.C. 10a - 10d) provides a preference for domestic end products for supplies acquired for use in the United States.
C. The City does not maintain a list of foreign articles that will be treated as domestic for this Contract; but will consider for approval foreign articles as domestic for this product if the articles are on a list approved by another Governmental Agency. The Contractor shall submit documentation with their offer demonstrating that the article is on an approved Governmental list.
D. The Contractor shall deliver only domestic end products except to the extent that it specified delivery of foreign end products in the provision of the Solicitation entitled “Buy American Act Certificate”.

61. **RIGHT TO INFORMATION:** The City of Denton reserves the right to use any and all information presented in any response to this Contract, whether amended or not, except as prohibited by law. Selection of rejection of the submittal does not affect this right.

62. **LICENSE FEES OR TAXES:** Provided the solicitation requires an awarded contractor or supplier to be licensed by the State of Texas, any and all fees and taxes are the responsibility of the respondent.

63. **PREVAILING WAGE RATES:** The Contractor shall comply with prevailing wage rates as defined by the United States Department of Labor Davis-Bacon Wage Determination at http://www.dol.gov/whd/contracts/dbra.htm and at the Wage Determinations website www.wdol.gov for Denton County, Texas (WD-2509).

64. **COMPLIANCE WITH ALL STATE, FEDERAL, AND LOCAL LAWS:** The Contractor or supplier shall comply with all State, federal, and local laws and requirements. The Contractor must comply with all applicable laws at all times, including, without limitation, the following: (i) §36.02 of the Texas Penal Code, which prohibits bribery; (ii) §36.09 of the Texas Penal Code, which prohibits the offering or conferring of benefits to public servants; and (iii) Chapter 552 of the Texas Government Code, which outlines policy for public information. The Contractor shall give all notices and comply with all laws and regulations applicable to furnishing and performance of the Contract.

65. **FEDERAL, STATE, AND LOCAL REQUIREMENTS:** Contractor shall demonstrate on-site compliance with the provisions of federal law dealing with issuance of Form W-2’s to common law employees. Contractor is responsible for both federal and State unemployment insurance coverage and standard Workers’ Compensation insurance coverage. Contractor shall ensure compliance with all federal and State tax laws and withholding requirements. The City of Denton shall not be liable to Contractor or its employees for any Unemployment or Workers’ Compensation coverage, or federal or State withholding requirements. Contractor shall indemnify the City of Denton and shall pay all costs, penalties, or losses resulting from Contractor’s omission or breach of this Section.

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66. **ATTORNEY'S FEES; LEGAL COSTS:** Contractor and City agree that the City will not be required to pay Contractor's attorney's fees or legal costs under any circumstances, unless expressly required by law.

67. **DRUG FREE WORKPLACE:** The Contractor shall comply with the applicable provisions of the Drug-Free Work Place Act of 1988 (Public Law 100-690, Title V, Subtitle D; 41 U.S.C. 701 ET SEQ.) and maintain a drug-free work environment; and the final rule, government-wide requirements for drug-free work place (grants), issued by the Office of Management and Budget and the Department of Defense (32 CFR Part 280, Subpart F) to implement the provisions of the Drug-Free Work Place Act of 1988 is incorporated by reference and the Contractor shall comply with the relevant provisions thereof, including any amendments to the final rule that may hereafter be issued.

68. **CONTRACTOR LIABILITY FOR DAMAGE TO GOVERNMENT PROPERTY:** The Contractor shall be liable for all damages to government-owned, leased, or occupied property and equipment caused by the Contractor and its employees, agents, subcontractors, and suppliers, including any delivery or cartage company, in connection with any performance pursuant to the Contract. The Contractor shall notify the City of Denton Procurement Manager in writing of any such damage within one (1) calendar day.

69. **FORCE MAJEURE:** The City of Denton, any Customer, and the Contractor shall not be responsible for performance under the Contract should it be prevented from performance by an act of war, order of legal authority, act of God, or other unavoidable cause not attributable to the fault or negligence of the City of Denton. In the event of an occurrence under this Section, the Contractor will be excused from any further performance or observance of the requirements so affected for as long as such circumstances prevail and the Contractor continues to use commercially reasonable efforts to recommence performance or observance whenever and to whatever extent possible without delay. The Contractor shall immediately notify the City of Denton Procurement Manager by telephone (to be confirmed in writing within five (5) calendar days of the inception of such occurrence) and describe at a reasonable level of detail the circumstances causing the non-performance or delay in performance.

70. **NON-WAIVER OF RIGHTS:** Failure of a Party to require performance by another Party under the Contract will not affect the right of such Party to require performance in the future. No delay, failure, or waiver of either Party's exercise or partial exercise of any right or remedy under the Contract shall operate to limit, impair, preclude, cancel, waive or otherwise affect such right or remedy. A waiver by a Party of any breach of any term of the Contract will not be construed as a waiver of any continuing or succeeding breach.

71. **NO WAIVER OF SOVEREIGN IMMUNITY:** The Parties expressly agree that no provision of the Contract is in any way intended to constitute a waiver by the City of Denton of any immunities from suit or from liability that the City of Denton may have by operation of law.

72. **RECORDS RETENTION:** The Contractor shall retain all financial records, supporting documents, statistical records, and any other records or books relating to the performances called for in the Contract. The Contractor shall retain all such records for a period of four (4) years after the expiration of the Contract, or until the CPA or State Auditor's Office is satisfied that all audit and litigation matters are resolved, whichever period is longer. The Contractor shall grant access

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to all books, records and documents pertinent to the Contract to the CPA, the State Auditor of Texas, and any federal governmental entity that has authority to review records due to federal funds being spent under the Contract. In the event the value of this Contract is One Million ($1,000,000) Dollars or greater: (i) all contracting information related to this contract will be preserved for the duration of the Contact; (ii) the Contractor shall provide any contracting information in its possession promptly upon request by the City; and (iii) at the expiration of this Contract, the Contractor will either provide all contracting information in its possession to the City or preserve same as required by the record retention requirements of the State of Texas.

73. **PROCUREMENT LAWS**: The City will not agree to any terms or conditions that cause the City to violate any federal, State, or local procurement laws, including its own Charter or Procurement Policy and any such laws included in boilerplate terms, online terms or other terms provided by the Contractor are considered null and void.

74. **AUTHORITY**: Contractor represents and warrants to the other that (a) it has company authority to execute and perform this Contract; (b) executing this Contract does not constitute a material conflict with, breach, or default under any applicable law, its respective organizational documents, or any documents, agreements, contracts or instruments which are binding upon it; and (c) this Contract creates valid, legal, and binding obligation enforceable against it, subject to applicable insolvency and bankruptcy laws. Contractor recognizes and agrees that a violation of this provision constitutes a material breach under this Contract.

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Exhibit D
Certificate of Interested Parties Electronic Filing

In 2015, the Texas Legislature adopted House Bill 1295, which added section 2252.908 of the Government Code. The law states that the City may not enter into this contract unless the Contractor submits a disclosure of interested parties (Form 1295) to the City at the time the Contractor submits the signed contract. The Texas Ethics Commission has adopted rules requiring the business entity to file Form 1295 electronically with the Commission.

Contractor will be required to furnish a Certificate of Interest Parties before the Contract is awarded, in accordance with Government Code 2252.908.

The Contractor shall:

1. Log onto the State Ethics Commission Website at :https://www.ethics.state.tx.us/filinginfo/1295/
2. Register utilizing the tutorial provided by the State
3. Print a copy of the completed Form 1295
4. Enter the Certificate Number on page 2 of this contract.
5. Complete and sign the Form 1295
6. Email the form to purchasing@cityofdenton.com with the contract number in the subject line. (EX: Contract 1234 – Form 1295)

The City must acknowledge the receipt of the filed Form 1295 not later than the 30th day after Council award. Once a Form 1295 is acknowledged, it will be posted to the Texas Ethics Commission's website within seven business days.

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T.H. Glennon Company Inc.

Exhibit E

Brighter Mulch Colors
MULCH COLORANTS, ADHESIVES & COATINGS

October 9, 2023

LIQUID COLORFAST COLORANTS FOR WOOD MULCH

Pricing Based on Quantity Purchased
Standard Packaging: 55 Gallon Drums and 250 Gallon Totes

ALL PRICES ARE PER POUND

	3 Drums	6 Drums	9 Drums or 1 Tote	15 Drums or 2 Totes	20 Drums or 3 Totes	30 Drums or 4 Totes	40 Drums or 6 Totes	8 Totes
#200 Series Browns, #260 Raven Black	$0.89	$0.84	$0.79	$0.74	$0.69	$0.67	$0.65	$0.63
#262 Black Max #105 Burgundy, #108 Fire Red	$0.99	$0.94	$0.89	$0.84	$0.79	$0.77	$0.75	$0.73
#384 Chocolate Cherry, #388 Dark Cherry, #391 Chocolate Brown #398 Hardwood Brown	$1.09	$1.04	$0.99	$0.94	$0.89	$0.87	$0.85	$0.83
#104 Dark Red, #208 Red	$1.14	$1.09	$1.04	$0.99	$0.94	$0.92	$0.90	$0.88
#234 Bright Red, #240 True Red	$1.24	$1.19	$1.14	$1.09	$1.04	$1.02	$1.00	$0.98
#212 Marigold, #215 Sunrise, #218 Gold	$1.26	$1.21	$1.16	$1.11	$1.06	$1.04	$1.02	$1.00

FREIGHT CHARGES MAY APPLY

#712 Grass Green = $2.30/lb. in a Tote

**** ANY PRODUCTS NOT LISTED ABOVE CALL FOR PRICING**

AVAILABLE UPON REQUEST:

Biocide, $0.03/lb.
Cedar Fragrance $0.60/lb. added to tote or drum
Cedar Fragrance $12.00/lb. for individual use

PACKAGING IN POUNDS (NET WEIGHTS):

	Per Drum	Per Tote
Blacks:		
#260, #262	500 lbs.	2,500 lbs.
Reds:		
#240	700 lbs.	3,500 lbs.
#104, #105, #108, #208, #234	740 lbs.	4,000 lbs.
Browns:		
#298, #299, #398	600 lbs.	3,000 lbs.
#391	650 lbs.	3,300 lbs.
#288, #289, #291, #384, #388	700 lbs.	3,500 lbs.
Golds:		
#212, #215, #218	600 lbs.	3,500 lbs.
Green:		
#712	600 lbs.	3,500 lbs.

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EXHIBIT F

CONFLICT OF INTEREST QUESTIONNAIRE - FORM CIQ

For vendor or other person doing business with local governmental entity

This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code, by a vendor who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the vendor meets requirements under Section 176.006(a) and by City of Denton Ethics Code, Ordinance 18-757.
By law this questionnaire must be filed with the records administrator of the local government entity not later than the 7th business day after the date the vendor becomes aware of facts that require the statement to be filed. *See* Section 176.006(a-1), Local Government Code.

A vendor commits an offense if the vendor knowingly violates Section 176.006, Local Government Code. An offense under this section is a misdemeanor.

1 **Name of vendor who has a business relationship with local governmental entity.**

T.H. Glennon Co., Inc.

2 [X] **Check this box if you are filing an update to a previously filed questionnaire.**

(The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date on which you became aware that the originally filed questionnaire was incomplete or inaccurate.)

3 **Name of local government officer about whom the information in this section is being disclosed.**

_____
Name of Officer

Describe each employment or other business relationship with the local government officer, or a family member of the officer, as described by Section 176.003(a)(2)(A). Also describe any family relations hip with the local government officer. This section, (item 3 including subparts A, B, C & D), must be completed for each officer with whom the vendor has an employment or other business relationship as defined by Section 176.001(1-a), Local Government Code. Attach additional pages to this Form CIQ as necessary.

A. Is the local government officer named in this section receiving or likely to receive taxable income, other than investment income, from the vendor?

[ ] Yes [X] No

B. Is the vendor receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer named in this section AND the taxable income is not received from the local governmental entity?

[ ] Yes [X] No

C. Is the filer of this questionnaire employed by a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership of one percent or more?

[X] Yes [ ] No

D. Describe each employment or business and family relationship with the local government officer named in this section.

4 [X] **I have no Conflict of Interest to disclose.**

5 DocuSigned by:
Brian R Shea
38AC64A5559543E...

Signature of vendor doing business with the governmental entity

11/4/2025
Date

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CONFLICT OF INTEREST QUESTIONNAIRE
For vendor doing business with local governmental entity

A complete copy of Chapter 176 of the Local Government Code may be found at http://www.statutes.legis.state.tx.us/ Docs/LG/htm/LG.176.htm. For easy reference, below are some of the sections cited on this form.

Local Government Code § 176.001(1-a): "Business relationship" means a connection between two or more parties based on commercial activity of one of the parties. The term does not include a connection based on:

(A) a transaction that is subject to rate or fee regulation by a federal, state, or local governmental entity or an agency of a federal, state, or local governmental entity;

(B) a transaction conducted at a price and subject to terms available to the public; or

(C) a purchase or lease of goods or services from a person that is chartered by a state or federal agency and that is subject to regular examination by, and reporting to, that agency.

Local Government Code § 176.003(a)(2)(A) and (B):

(A) A local government officer shall file a conflicts disclosure statement with respect to a vendor if:

(2) the vendor:

(A) has an employment or other business relationship with the local government officer or a family member of the officer that results in the officer or family member receiving taxable income, other than investment income, that exceeds $2,500 during the 12-month period preceding the date that the officer becomes aware that

(i) a contract between the local governmental entity and vendor has been executed; or

(ii) the local governmental entity is considering entering into a contract with the vendor;

(B) has given to the local government officer or a family member of the officer one or more gifts that have an aggregate value of more than $100 in the 12-month period preceding the date the officer becomes aware that:

(i) a contract between the local governmental entity and vendor has been executed; or

(ii) the local governmental entity is considering entering into a contract with the vendor.

Local Government Code § 176.006(a) and (a-1)

(a) A vendor shall file a completed conflict of interest questionnaire if the vendor has a business relationship with a local governmental entity and:

(1) has an employment or other business relationship with a local government officer of that local governmental entity, or a family member of the officer, described by Section 176.003(a)(2)(A);

(2) has given a local government officer of that local governmental entity, or a family member of the officer, one or more gifts with the aggregate value specified by Section 176.003(a)(2)(B), excluding any gift described by Section 176.003(a-1); or

(3) has a family relationship with a local government officer of that local governmental entity.

(a-1) The completed conflict of interest questionnaire must be filed with the appropriate records administrator not later than the seventh business day after the later of:

(1) the date that the vendor:

(A) begins discussions or negotiations to enter into a contract with the local governmental entity; or

(B) submits to the local governmental entity an application, response to a request for proposals or bids, correspondence, or another writing related to a potential contract with the local governmental entity; or

(2) the date the vendor becomes aware:

(A) of an employment or other business relationship with a local government officer, or a family member of the officer, described by Subsection (a);

(B) that the vendor has given one or more gifts described by Subsection (a); or

(C) of a family relationship with a local government officer.

City of Denton Ethics Code Ordinance Number 18-757

Definitions:

Relative: a family member related to a City Official within the third 3rd degree of affinity (marriage) or consanguinity (blood or adoption)

City Official: for purpose of this article, the term consists of the Council Members, Department Heads, or member of the Board of Ethics, Planning and zoning Commission Members, Board of Adjustment, Historic Landmark Commission, or Public Utilities Board

Vendor: a person who provides or seeks to provide goods, services, and/or real property to the City in exchange for compensation. This definition does not include those property owners from whom the City acquires public right-of-way or other real property interests for public use.

Per the City of Denton Ethics Code, Section 2-273. – Prohibitions

(3) It shall be a violation of this Article for a Vendor to offer or give a Gift to City Official exceeding fifty dollars ($50.00) per gift, or multiple gifts cumulatively valued at more than two hundred dollars ($200.00) per a single fiscal year.

Per the City of Denton Ethics Code, Section 2-282. – Disposition (b), (5) Ineligibility

If the Board of Ethics finds that a Vendor has violated this Article, the Board may recommend to the City Manager that the Vendor be deemed ineligible to enter into a City contract or other arrangement for goods, services, or real property, for a period of one (1) year.

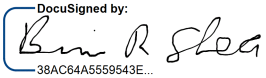
Certificate Of Completion

Envelope Id: 8949D450-A026-440E-B72C-206C6D64684C
Status: Sent
Subject: Please DocuSign: City Council Contract 8822 Compost Mulch Colorant
Source Envelope:
Document Pages: 31
Signatures: 4
Certificate Pages: 6
Initials: 1
AutoNav: Enabled
EnvelopeId Stamping: Enabled
Time Zone: (UTC-06:00) Central Time (US & Canada)

Envelope Originator:
Erica Garcia
901B Texas Street
Denton, TX 76209
erica.garcia@cityofdenton.com
IP Address: 198.49.140.104

Record Tracking

Status: Original
10/20/2025 8:55:08 AM
Holder: Erica Garcia
erica.garcia@cityofdenton.com
Location: DocuSign

Signer Events	Signature	Timestamp
Erica Garcia erica.garcia@cityofdenton.com Senior Buyer City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign	**Completed** Using IP Address: 198.49.140.104	Sent: 10/20/2025 8:58:33 AM Viewed: 10/20/2025 8:58:42 AM Signed: 10/20/2025 9:00:08 AM
Lori Hewell lori.hewell@cityofdenton.com Purchasing Manager City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign	DS Signature Adoption: Pre-selected Style Using IP Address: 198.49.140.10	Sent: 10/20/2025 9:00:11 AM Viewed: 10/20/2025 1:23:12 PM Signed: 10/21/2025 9:39:39 AM
Marcella Lunn marcella.lunn@cityofdenton.com Senior Deputy City Attorney City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign	DocuSigned by: 4B070831B4AA438... Signature Adoption: Pre-selected Style Using IP Address: 198.49.140.10	Sent: 10/21/2025 9:39:42 AM Viewed: 10/21/2025 6:47:36 PM Signed: 10/21/2025 6:49:39 PM
Brian Shea Brian@glennoncompany.com President Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Accepted: 11/4/2025 11:57:17 AM ID: 4fdefa46-a9dc-4c0b-8611-75d4bbbb833b	DocuSigned by:  38AC64A5559543E... Signature Adoption: Drawn on Device Using IP Address: 64.140.215.28	Sent: 10/21/2025 6:49:42 PM Resent: 10/24/2025 3:16:35 PM Resent: 11/4/2025 8:24:11 AM Resent: 11/4/2025 8:30:11 AM Viewed: 11/4/2025 11:57:17 AM Signed: 11/4/2025 12:00:17 PM

Signer Events	Signature	Timestamp
Stephen D Gay stephen.gay@cityofdenton.com General Manager Water Utilities Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Accepted: 11/4/2025 3:42:07 PM ID: 4f89bb2d-1339-4b05-b002-7dc991fd22c8	Signed by: FEB48BB9726E4A9... Signature Adoption: Pre-selected Style Using IP Address: 198.49.140.10	Sent: 11/4/2025 12:00:20 PM Viewed: 11/4/2025 3:42:07 PM Signed: 11/4/2025 3:42:41 PM
Cheyenne Defee cheyenne.defee@cityofdenton.com Procurement Administration Supervisor City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign		Sent: 11/4/2025 3:42:45 PM
Sara Hensley sara.hensley@cityofdenton.com Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign		
Ingrid Rex Ingrid.Rex@cityofdenton.com Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign		

In Person Signer Events	Signature	Timestamp

Editor Delivery Events	Status	Timestamp

Agent Delivery Events	Status	Timestamp

Intermediary Delivery Events	Status	Timestamp

Certified Delivery Events	Status	Timestamp

Carbon Copy Events	Status	Timestamp
Cheyenne Defee cheyenne.defee@cityofdenton.com Procurement Administration Supervisor City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign	COPIED	Sent: 10/20/2025 9:00:10 AM
Gretna Jones gretna.jones@cityofdenton.com Legal Secretary City of Denton Security Level: Email, Account Authentication (None)	COPIED	Sent: 11/4/2025 3:42:44 PM Viewed: 11/6/2025 8:14:33 AM

Carbon Copy Events	Status	Timestamp
Electronic Record and Signature Disclosure: Not Offered via Docusign		
City Secretary Office citysecretary@cityofdenton.com Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign		
Rusty Willard Rusty.Willard@cityofdenton.com Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign		

Witness Events	Signature	Timestamp

Notary Events	Signature	Timestamp

Envelope Summary Events	Status	Timestamps
Envelope Sent	Hashed/Encrypted	10/20/2025 8:58:34 AM
Envelope Updated	Security Checked	10/20/2025 2:08:19 PM
Envelope Updated	Security Checked	11/4/2025 8:30:10 AM
Envelope Updated	Security Checked	11/4/2025 8:30:10 AM
Envelope Updated	Security Checked	11/4/2025 8:30:10 AM
Envelope Updated	Security Checked	11/4/2025 8:33:14 AM

Payment Events	Status	Timestamps

Electronic Record and Signature Disclosure

ELECTRONIC RECORD AND SIGNATURE DISCLOSURE

From time to time, City of Denton (we, us or Company) may be required by law to provide to you certain written notices or disclosures. Described below are the terms and conditions for providing to you such notices and disclosures electronically through your DocuSign, Inc. (DocuSign) Express user account. Please read the information below carefully and thoroughly, and if you can access this information electronically to your satisfaction and agree to these terms and conditions, please confirm your agreement by clicking the 'I agree' button at the bottom of this document.

Getting paper copies

At any time, you may request from us a paper copy of any record provided or made available electronically to you by us. For such copies, as long as you are an authorized user of the DocuSign system you will have the ability to download and print any documents we send to you through your DocuSign user account for a limited period of time (usually 30 days) after such documents are first sent to you. After such time, if you wish for us to send you paper copies of any such documents from our office to you, you will be charged a $0.00 per-page fee. You may request delivery of such paper copies from us by following the procedure described below.

Withdrawing your consent

If you decide to receive notices and disclosures from us electronically, you may at any time change your mind and tell us that thereafter you want to receive required notices and disclosures only in paper format. How you must inform us of your decision to receive future notices and disclosure in paper format and withdraw your consent to receive notices and disclosures electronically is described below.

Consequences of changing your mind

If you elect to receive required notices and disclosures only in paper format, it will slow the speed at which we can complete certain steps in transactions with you and delivering services to you because we will need first to send the required notices or disclosures to you in paper format, and then wait until we receive back from you your acknowledgment of your receipt of such paper notices or disclosures. To indicate to us that you are changing your mind, you must withdraw your consent using the DocuSign 'Withdraw Consent' form on the signing page of your DocuSign account. This will indicate to us that you have withdrawn your consent to receive required notices and disclosures electronically from us and you will no longer be able to use your DocuSign Express user account to receive required notices and consents electronically from us or to sign electronically documents from us.

All notices and disclosures will be sent to you electronically

Unless you tell us otherwise in accordance with the procedures described herein, we will provide electronically to you through your DocuSign user account all required notices, disclosures, authorizations, acknowledgements, and other documents that are required to be provided or made available to you during the course of our relationship with you. To reduce the chance of you inadvertently not receiving any notice or disclosure, we prefer to provide all of the required notices and disclosures to you by the same method and to the same address that you have given us. Thus, you can receive all the disclosures and notices electronically or in paper format through the paper mail delivery system. If you do not agree with this process, please let us know as described below. Please also see the paragraph immediately above that describes the consequences of your electing not to receive delivery of the notices and disclosures electronically from us.

How to contact City of Denton:
You may contact us to let us know of your changes as to how we may contact you electronically, to request paper copies of certain information from us, and to withdraw your prior consent to receive notices and disclosures electronically as follows:
To contact us by email send messages to: purchasing@cityofdenton.com

To advise City of Denton of your new e-mail address
To let us know of a change in your e-mail address where we should send notices and disclosures electronically to you, you must send an email message to us at melissa.kraft@cityofdenton.com and in the body of such request you must state: your previous e-mail address, your new e-mail address. We do not require any other information from you to change your email address..
In addition, you must notify DocuSign, Inc to arrange for your new email address to be reflected in your DocuSign account by following the process for changing e-mail in DocuSign.

To request paper copies from City of Denton
To request delivery from us of paper copies of the notices and disclosures previously provided by us to you electronically, you must send us an e-mail to purchasing@cityofdenton.com and in the body of such request you must state your e-mail address, full name, US Postal address, and telephone number. We will bill you for any fees at that time, if any.

To withdraw your consent with City of Denton
To inform us that you no longer want to receive future notices and disclosures in electronic format you may:

i. decline to sign a document from within your DocuSign account, and on the subsequent page, select the check-box indicating you wish to withdraw your consent, or you may;
ii. send us an e-mail to purchasing@cityofdenton.com and in the body of such request you must state your e-mail, full name, IS Postal Address, telephone number, and account number. We do not need any other information from you to withdraw consent.. The consequences of your withdrawing consent for online documents will be that transactions may take a longer time to process..

Required hardware and software

Operating Systems:	Windows2000? or WindowsXP?
Browsers (for SENDERS):	Internet Explorer 6.0? or above
Browsers (for SIGNERS):	Internet Explorer 6.0?, Mozilla FireFox 1.0, NetScape 7.2 (or above)
Email:	Access to a valid email account
Screen Resolution:	800 x 600 minimum
Enabled Security Settings:	•Allow per session cookies •Users accessing the internet behind a Proxy Server must enable HTTP 1.1 settings via proxy connection

** These minimum requirements are subject to change. If these requirements change, we will provide you with an email message at the email address we have on file for you at that time providing you with the revised hardware and software requirements, at which time you will have the right to withdraw your consent.

Acknowledging your access and consent to receive materials electronically
To confirm to us that you can access this information electronically, which will be similar to other electronic notices and disclosures that we will provide to you, please verify that you were able to read this electronic disclosure and that you also were able to print on paper or electronically save this page for your future reference and access or that you were able to e-mail this disclosure and consent to an address where you will be able to print on paper or save it for your future reference and access. Further, if you consent to receiving notices and disclosures exclusively in electronic format on the terms and conditions described above, please let us know by clicking the 'I agree' button below.
By checking the 'I Agree' box, I confirm that:

- I can access and read this Electronic CONSENT TO ELECTRONIC RECEIPT OF ELECTRONIC RECORD AND SIGNATURE DISCLOSURES document; and

- I can print on paper the disclosure or save or send the disclosure to a place where I can print it, for future reference and access; and

- Until or unless I notify City of Denton as described above, I consent to receive from exclusively through electronic means all notices, disclosures, authorizations, acknowledgements, and other documents that are required to be provided or made available to me by City of Denton during the course of my relationship with you.

City of Denton

City Hall
215 E. McKinney Street
Denton, Texas
www.cityofdenton.com

AGENDA INFORMATION SHEET

DEPARTMENT: Procurement

ACM: Christine Taylor

DATE: December 15, 2025

SUBJECT

Consider recommending adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute a contract with Tanner Industries, Inc., for the purchase of anhydrous ammonia for the Water Production Department; providing for the expenditure of funds therefor; and providing an effective date (IFB 8823-1 – awarded to Tanner Industries, Inc., in a three (3) year, with the option for two (2) additional one (1) year extensions, in the total five (5) year not-to-exceed amount of $264,000.00).

STRATEGIC ALIGNMENT

This action supports Key Focus Area: Support Healthy and Safe Communities.

INFORMATION/BACKGROUND

This item supports the purchase of water treatment chemicals for the Water Production department. This chemical is essential to the treatment processes that ensure the delivery of safe, potable water for the City of Denton and surrounding communities. This chemical serves a specific operational purpose and is critical to maintaining regulatory compliance and service reliability.

Anhydrous Ammonia is used to combine with chlorine or sodium hypochlorite to form chloramines for disinfection. The agreement will support uninterrupted operations at the water production facilities.

Chemical	Five (5) Year Spend
Anhydrous Ammonia	$240,000.00
Contingency-10%	24,000.00
Total	$264,000.00

Invitation for Bids was sent to 212 prospective suppliers of this item, including three (3) Denton firms. In addition, specifications were placed on the Procurement website for prospective suppliers to download, and advertised in the local newspaper. Three (3) bids were received. The lowest bid was received by Tanner Industries, Inc.

NIGP Code Used for Solicitation:	**885** - Water and Wastewater Treating Chemicals
Notifications sent for Solicitation sent in IonWave:	212
Number of Suppliers that viewed Solicitation in IonWave:	16
HUB-Historically Underutilized Business Invitations sent out:	17
SBE-Small Business Enterprise Invitations sent out:	79
Responses from Solicitation:	3

RECOMMENDATION

Award a contract with Tanner Industries, Inc., for the purchase of anhydrous ammonia for the Water Production Department, in a three (3) year, with the option for two (2) additional one (1) year extensions, in the total five (5) year not-to-exceed amount of $264,000.

PRINCIPAL PLACE OF BUSINESS

Tanner Industries, Inc.
Southampton, PA

ESTIMATED SCHEDULE OF PROJECT

This is an initial three (3) year contract with options to extend the contract for two (2) additional one (1) year periods, with all terms and conditions remaining the same.

FISCAL INFORMATION

These products and services will be funded through the department's budget on an as-needed basis. The City will only pay for services rendered and is not obligated to pay the full contract amount unless needed.

EXHIBITS

Exhibit 1: Agenda Information Sheet
Exhibit 2: Bid Tabulation
Exhibit 3: Ordinance and Contract

Respectfully submitted:
Lori Hewell, 940-349-7100
Purchasing Manager

For information concerning this acquisition, contact: Trever Heskett, 940-349-7627.

Legal point of contact: Marcella Lunn at 940-349-8333.

IFB 8823-1 - Bid Tabulation for Anhydrous Ammonia

			Respondent's Business Name:	**Tanner Industries, Inc.**		Gasochem International LLC		TOCA LLC	
			Principal Place of Business (City and State):	**Southhapmton, PA**		Houston, TX		Keller, TX	
Line #	**Description**	**QTY**	**UOM**	**Unit**	**Extended**	**Unit**	**Extended**	**Unit**	**Extended**
1	**SECTION A WATER TREATMENT CHEMICALS**								
2	Anhydrous Ammonia 99.995 % Grade (approximately 2,000 Lb. Shipments)	47,563	lbs	**$0.98**	**$46,611.74**	$1.40	$66,588.20	$1.67	$79,430.21
			Total:	**$46,611.74**		$66,588.20		$79,430.21	

ORDINANCE NO. _____

AN ORDINANCE OF THE CITY OF DENTON, A TEXAS HOME-RULE MUNICIPAL CORPORATION, AUTHORIZING THE CITY MANAGER TO EXECUTE A CONTRACT WITH TANNER INDUSTRIES, INC., FOR THE PURCHASE OF ANHYDROUS AMMONIA FOR THE WATER PRODUCTION DEPARTMENT; PROVIDING FOR THE EXPENDITURE OF FUNDS THEREFOR; AND PROVIDING AN EFFECTIVE DATE (IFB 8823-1 – AWARDED TO TANNER INDUSTRIES, INC., IN A THREE (3) YEAR, WITH THE OPTION FOR TWO (2) ADDITIONAL ONE (1) YEAR EXTENSIONS, IN THE TOTAL FIVE (5) YEAR NOT-TO-EXCEED AMOUNT OF $264,000.00).

WHEREAS, the City has solicited, received, and tabulated competitive bids for the purchase of necessary materials, equipment, supplies, or services in accordance with the procedures of state law and city ordinances; and

WHEREAS, the City Manager, or a designated employee, has reviewed and recommended that the herein described bids are the lowest responsible bids for the materials, equipment, supplies, or services as shown in the "Bid Proposals" submitted therefore; and

WHEREAS, this procurement was undertaken as part of the City's governmental function; and

WHEREAS, the City Council has provided in the City Budget for the appropriation of funds to be used for the purchase of the materials, equipment, supplies, or services approved and accepted herein; NOW, THEREFORE,

THE COUNCIL OF THE CITY OF DENTON HEREBY ORDAINS:

SECTION 1. The following competitive bids for the materials, equipment, supplies, or services as described in the "Bid Invitations", "Bid Proposals", or plans and specifications on file in the Office of the City's Purchasing Agent filed according to the bid number assigned hereto, are hereby accepted and approved as being the lowest responsible bids:

BID NUMBER	VENDOR	AMOUNT
8823-1	Tanner Industries, Inc.	$264,000.00

SECTION 2. That by the acceptance and approval of the above competitive bids the City accepts the offer of the persons submitting the bids for such items and agrees to purchase the materials, equipment, supplies, or services in accordance with the terms, specifications, standards, quantities, and for the specified sums contained in the Bid Invitations, Bid Proposals, and related documents.

SECTION 3. Should the City and the winning bidder(s) wish to enter into a formal written agreement as a result of the acceptance, approval, and awarding of the bids, the City

Manager, or their designated representative, is hereby authorized to execute a written contract, which shall be attached hereto; provided that the written contract is in accordance with the terms, conditions, specifications, standards, quantities, and specified sums contained in the Bid Proposal and related documents, and to extend that contract as determined to be advantageous to the City of Denton.

SECTION 4. The City Council of the City of Denton hereby expressly delegates the authority to take any actions that may be required or permitted to be performed by the City of Denton under this ordinance to the City Manager of the City of Denton, or their designee.

SECTION 5. By the acceptance and approval of the above enumerated bids, the City Council hereby authorizes the expenditure of funds therefor in the amount and in accordance with the approved bids.

SECTION 6. This ordinance shall become effective immediately upon its passage and approval.

The motion to approve this ordinance was made by _____ and seconded by _____. The ordinance was passed and approved by the following vote [___ - ___]:

	Aye	**Nay**	**Abstain**	**Absent**
Mayor Gerard Hudspeth:	_____	_____	_____	_____
Vicki Byrd, District 1:	_____	_____	_____	_____
Brian Beck, District 2:	_____	_____	_____	_____
Suzi Rumohr, District 3:	_____	_____	_____	_____
Joe Holland, District 4:	_____	_____	_____	_____
Brandon Chase McGee, At Large Place 5:	_____	_____	_____	_____
Jill Jester, At Large Place 6:	_____	_____	_____	_____

PASSED AND APPROVED this the _____ day of _____, 2025.

_____
GERARD HUDSPETH, MAYOR

ATTEST:
INGRID REX, CITY SECRETARY

BY: _____

APPROVED AS TO LEGAL FORM:
MACK REINWAND, CITY ATTORNEY

BY: Leah Bush

Docusign Envelope ID: A62ED0E9-0BEB-4D7C-966E-8FF8554B308D

Docusign City Council Transmittal Coversheet

IFB	8823-1
File Name	Supply of Anhydrous Ammonia
Purchasing Contact	Gabby Leeper
City Council Target Date	
Piggy Back Option	No
Contract Expiration	
Ordinance	

DS
LH

Docusign Envelope ID: A62ED0E9-0BEB-4D7C-966E-8FF8554B308D

CONTRACT BY AND BETWEEN
CITY OF DENTON, TEXAS AND TANNER INDUSTRIES, INC.
(Contract #8823-1)

THIS CONTRACT is made and entered into this date _____, by and between _Tanner Industries, Inc._ a Pennsylvania corporation, whose address _735 Davisville Road Southampton, PA 18966, hereinafter referred to as "Contractor," and the **CITY OF DENTON, TEXAS**, a home rule municipal corporation, hereinafter referred to as "City," to be effective upon approval of the Denton City Council and subsequent execution of this Contract by the Denton City Manager or their duly authorized designee.

For and in consideration of the covenants and agreements contained herein, and for the mutual benefits to be obtained hereby, the parties agree as follows:

SCOPE OF SERVICES

Contractor shall provide services in accordance with the City's 8823-1 Supply of Anhydrous Ammonia a copy of which is on file at the office of Purchasing Agent and incorporated herein for all purposes. The Contract consists of this written agreement and the following items which are attached hereto, or on file, and incorporated herein by reference:

(a) Special Terms and Conditions **(Exhibit "A");**
(b) City of Denton's IFB 8823-1(the "Solicitation") **(Exhibit "B" on file at the office of the Purchasing Agent**);
(c) City of Denton Standard Terms and Conditions **(Exhibit "C");**
(d) Certificate of Interested Parties Electronic Filing **(Exhibit "D");**
(e) Insurance Requirements **(Exhibit "E");**
(f) Contractor's Proposal ("Contractor's Offer") **(Exhibit "F")**;
(g) Form CIQ – Conflict of Interest Questionnaire **(Exhibit "G")**

These documents make up the Contract documents and what is called for by one shall be as binding as if called for by all. In the event of an inconsistency or conflict in any of the provisions of the Contract documents, the inconsistency or conflict shall be resolved by giving precedence first to the written agreement then to the contract documents in the order in which they are listed above. These documents shall be referred to collectively as "Contract Documents."

Prohibition on Contracts with Companies Boycotting Israel
Contractor acknowledges that in accordance with Chapter 2271 of the Texas Government Code, City is prohibited from entering into a contract with a company for goods or services unless the contract contains a written verification from the company that it: (1) does not boycott Israel; and (2) will not boycott Israel during the term of the contract. The terms "boycott Israel" and "company" shall have the meanings ascribed to those terms in Section 808.001 of the Texas Government Code. ***By signing this Contract, Contractor certifies that Contractor's signature provides written verification to the City that Contractor: (1) does not boycott Israel; and (2) will not boycott Israel during the term of the Contract.*** Failure to meet or maintain the requirements under this provision will be considered a material breach.

Prohibition on Contracts with Companies Boycotting Certain Energy Companies
Contractor acknowledges that in accordance with Chapter 2276 of the Texas Government Code, City is prohibited from entering into a contract with a company for goods or services unless the contract contains

Docusign Envelope ID: A62ED0E9-0BEB-4D7C-966E-8FF8554B308D

written verification from the company that it (1) does not boycott energy companies; and (2) will not boycott energy companies during the term of the contract. The terms "boycott energy company" and "company" shall have the meanings ascribed to those terms in Section 809.001 of the Texas Government Code. ***By signing this agreement, Contractor certifies that Contractor's signature provides written verification to the City that Contractor: (1) does not boycott energy companies; and (2) will not boycott energy companies during the term of the Contract.*** Failure to meet or maintain the requirements under this provision will be considered a material breach.

Prohibition on Contracts with Companies Boycotting Certain Firearm Entities and Firearm Trade Associations

Contractor acknowledges that in accordance with Chapter 2274 of the Texas Government Code, City is prohibited from entering into a contract with a company for goods or services unless the contract contains written verification from the company that it (1) does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association; and (2) will not discriminate during the term of the contract against a firearm entity or firearm trade association. The terms "discriminate against a firearm entity or firearm trade association," "firearm entity" and "firearm trade association" shall have the meanings ascribed to those terms in Chapter 2274 of the Texas Government Code. ***By signing this Contract, Contractor certifies that Contractor's signature provides written verification to the City that Contractor: (1) does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association; and (2) will not discriminate during the term of this Contract against a firearm entity or firearm trade association.*** Failure to meet or maintain the requirements under this provision will be considered a material breach.

Prohibition On Contracts with Companies Doing Business with Iran, Sudan, or a Foreign Terrorist Organization

Section 2252 of the Texas Government Code restricts City from contracting with companies that do business with Iran, Sudan, or a foreign terrorist organization. ***By signing this Contract, Contractor certifies that Contractor's signature provides written verification to the City that Contractor, pursuant to Chapter 2252, is not ineligible to enter into this Contract and will not become ineligible to receive payments under this Contract by doing business with Iran, Sudan, or a foreign terrorist organization***. Failure to meet or maintain the requirements under this provision will be considered a material breach.

Termination Right for Contracts with Companies Doing Business with Certain Foreign-Owned Companies

The City of Denton may terminate this Contract immediately without any further liability if the City of Denton determines, in its sole judgment, that this Contract meets the requirements under Chapter 2275, and Contractor is, or will be in the future, (i) owned by or the majority of stock or other ownership interest of the company is held or controlled by individuals who are citizens of China, Iran, North Korea, Russia, or other designated country (ii) directly controlled by the Government of China, Iran, North Korea, Russia, or other designated country, or (iii) is headquartered in China, Iran, North Korea, Russia, or other designated country.

The parties agree to transact business electronically. Any statutory requirements that certain terms be in writing will be satisfied using electronic documents and signing. Electronic signing of this document will be deemed an original for all legal purposes.

IN WITNESS WHEREOF, the parties of these presents have executed this Contract in the year and day first above written.

Docusign Envelope ID: A62ED0E9-0BEB-4D7C-966E-8FF8554B308D

CONTRACTOR

Signed by:
BY: Matt Tanner
F8B6C6B0D1E0...
AUTHORIZED SIGNATURE

Printed Name: Matt Tanner

Title: Sales Administrator

215-322-1238
PHONE NUMBER

matttanner@tannerind.com
EMAIL ADDRESS

2025-1387520
TEXAS ETHICS COMMISSION
CERTIFICATE NUMBER

THIS AGREEMENT HAS BEEN BOTH REVIEWED AND APPROVED as to financial and operational obligations and business terms.

Signed by:
Stephen D Gay
1EEA8A972EF24...
SIGNATURE

Stephen D Gay
PRINTED NAME

General Manager
TITLE

Water Utilities and Street Operations
DEPARTMENT

CITY OF DENTON, TEXAS

BY: _____
SARA HENSLEY
CITY MANAGER

ATTEST:
INGRID REX, CITY SECRETARY

BY: _____

APPROVED AS TO LEGAL FORM:
MACK REINWAND, CITY ATTORNEY

DocuSigned by:
BY: Marcella Lunn
4B070831B4AA438...

Docusign Envelope ID: A62ED0E9-0BEB-4D7C-966E-8FF8554B308D

Exhibit A
Special Terms and Conditions

1. Total Contract Amount

The contract total for services shall not exceed $264,000. Pricing shall be per Exhibit F attached.

2. The Quantities

The quantities indicated on Exhibit F are estimates based upon the best available information. The City reserves the right to increase or decrease the quantities to meet its actual needs without any adjustments in the bid price. Individual purchase orders will be issued on an as needed basis.

3. Contract Terms

The contract term will be three (3) years, effective from date of award. The City and the Supplier shall have the option to renew this contract for an additional two (2) one-year periods.

The Contract shall commence upon the issuance of a Notice of Award by the City of Denton and shall automatically renew each year, from the date of award by City Council. The Supplier's request to not renew the contract must be submitted in writing to the Purchasing Manager at least 60 days prior to the contract renewal date for each year. At the sole option of the City of Denton, the Contract may be further extended as needed, not to exceed a total of six (6) months.

4. Price Escalation and De-escalation

On Supplier's request in the form stated herein, the City will implement an escalation/de-escalation price adjustment annually based on these special terms. Any request for price adjustment must be based on the, U.S Department of Labor, Bureau of Labor Statistics, Producer Price Index (PPI) or the manufacturer published pricing list. The maximum escalation will not exceed +/- 8% for any individual year. The escalation will be determined annually at the renewal date. The price will be increased or decreased based upon the annual percentage change in the PPI or the percentage change in the manufacturer's price list. Should the PPI or manufacturer price list change exceed a minimum threshold value of +/-1%, then the stated eligible bid prices shall be adjusted in accordance with the percent change not to exceed the 8% limit per year. The supplier should provide documentation as percentage of each cost associated with the unit prices quoted for consideration.

Request must be submitted in writing with supporting evidence for need of such increase to the Purchasing Manager at least 60 days prior to contract expiration of each year. Respondent must also provide supporting documentation as justification for the request. If no request is made, then it will be assumed that the current contract price will be in effect.

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Upon receipt of such request, the City of Denton reserves the right to either: accept the escalation as competitive with the general market price at the time, and become effective upon the renewal date of the contract award or reject the increases within 30 calendar days after receipt of a properly submitted request. If a properly submitted increase is rejected, the Contractor may request cancellation of such items from the Contract by giving the City of Denton written notice. Cancellation will not go into effect for 15 calendar days after a determination has been issued. Pre-price increase prices must be honored on orders dated up to the official date of the City of Denton approval and/or cancellation.

The request can be sent by e-mail to: purchasing@cityofdenton.com noting the solicitation number.

The City of Denton reserves the right to accept, reject, or negotiate the proposed price changes.

5. Performance Liquidated Damages

The Contractor shall incur contractual payment losses, as initiated by the City for performance that falls short of specified performance standards as outlined below:

- Delivery beyond contracted lead times
- Performance below contracted levels (services only)

The Contractor shall be assessed a one (1%) percent fee each month when any one of the performance standards outlined above are not met in full. The Contractor shall be assessed a two (2%) percent profit fee each month when any two (2) or more performance standards outlined above are not met in full. At the end of each month, the City will review the monthly reports and determine the percentage of penalty to be assessed to the Contractor's monthly profit margin.

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Exhibit C
City of Denton
Standard Purchase Terms and Conditions

These standard Terms and Conditions and the Terms and Conditions, Specifications, Drawings and other requirements included in the City of Denton's contract are applicable to contracts/purchase orders issued by the City of Denton hereinafter referred to as the City or Buyer and the Seller or respondent herein after referred to as Contractor. Any deviations must be in writing and signed by a representative of the City's Procurement Department and the Contractor . No Terms and Conditions contained in the seller's proposal response, invoice, or statement shall serve to modify the terms set forth herein. If there is a conflict between the provisions on the face of the contract/purchase order these written provisions will take precedence.

The Contractor agrees that the Contract shall be governed by the following terms and conditions, unless exceptions are duly noted and fully negotiated. Unless otherwise specified in the Contract, Sections 3, 4, 5, 6, 7, 8, 20, and 21 shall apply only to a solicitation to purchase goods, and sections 9, 10, 11, and 22 shall apply only to a solicitation to purchase services to be performed principally at the City's premises or on public rights-of-way.

1. **CONTRACTOR'S OBLIGATIONS**. The Contractor shall fully and timely provide all deliverables described in the Solicitation and in the Contractor's Offer in strict accordance with the terms, covenants, and conditions of the Contract and all applicable federal, State, and local laws, rules, and regulations.

2. **EFFECTIVE DATE/TERM**. Unless otherwise specified in the Solicitation or Exhibit A, this Contract shall be effective as of the date this Contract is signed by the City and shall continue in effect until all obligations are performed in accordance with the Contract.

3. **CONTRACTOR TO PACKAGE DELIVERABLES**: The Contractor will package deliverables in accordance with good commercial practice and shall include a packing list showing the description of each item, the quantity and unit price unless otherwise provided in the Solicitation or Contractor's Offer, each shipping container shall be clearly and permanently marked as follows: (a) The Contractor's name and address, (b) the City's name, address, purchase order or purchase release number, and the price agreement number, if applicable, (c) container number and total number of containers, e.g. box 1 of 4 boxes, and (d) the number of the container bearing the packing list. The Contractor shall bear cost of packaging. Deliverables shall be suitably packed to secure lowest transportation costs and to conform to all the requirements of common carriers and any applicable specification. The City's count or weight shall be final and conclusive on shipments not accompanied by packing lists.

4. **SHIPMENT UNDER RESERVATION PROHIBITED**: The Contractor is not authorized to ship the deliverables under reservation and no tender of a bill of lading will operate as a tender of deliverables.

5. **TITLE & RISK OF LOSS**: Title to and risk of loss of the deliverables shall pass to the City only when the City actually receives and accepts the deliverables.

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6. **DELIVERY TERMS AND TRANSPORTATION CHARGES**: Deliverables shall be shipped F.O.B. point of delivery unless otherwise specified in the Solicitation or Contractor's Offer. Unless otherwise stated in the Contractor's Offer, the Contractor's price shall be deemed to include all delivery and transportation charges. The City shall have the right to designate what method of transportation shall be used to ship the deliverables. The place of delivery shall be that set forth in the purchase order.

7. **RIGHT OF INSPECTION AND REJECTION**: The City expressly reserves all rights under law, including, but not limited to the Uniform Commercial Code, to inspect the deliverables at delivery before accepting them, and to reject defective or non-conforming deliverables. If the City has the right to inspect the Contractor's, or the Contractor's Subcontractor's, facilities, or the deliverables at the Contractor's, or the Contractor's Subcontractor's, premises, the Contractor shall furnish, or cause to be furnished, without additional charge, all reasonable facilities and assistance to the City to facilitate such inspection.

8. **NO REPLACEMENT OF DEFECTIVE TENDER**: Every tender or delivery of deliverables must fully comply with all provisions of the Contract as to time of delivery, quality, and quantity. Any non-complying tender shall constitute a breach and the Contractor shall not have the right to substitute a conforming tender; provided, where the time for performance has not yet expired, the Contractor may notify the City of the intention to cure and may then make a conforming tender within the time allotted in the contract to perform but not afterward. If, instead of requiring immediate correction or removal and replacement of defective or non-conforming deliverables, the City prefers to accept it, the City may do so. The Contractor shall pay all claims, costs, losses and damages attributable to the City's evaluation of and determination to accept such defective or non-conforming deliverables. If any such acceptance occurs prior to final payment, the City may deduct such amounts as are necessary to compensate the City for the diminished value of the defective or non-conforming deliverables. If the acceptance occurs after final payment, such amount will be refunded to the City by the Contractor.

9. **PLACE AND CONDITION OF WORK**: This paragraph only applies to the purchase of services to be primarily performed at the City's premises or on City property/right-of-way. The City shall provide the Contractor access to the sites where the Contractor is to perform the services as required in order for the Contractor to perform the services in a timely and efficient manner, in accordance with and subject to the applicable security laws, rules, and regulations. The Contractor acknowledges that it has satisfied itself as to the nature of the City's service requirements and specifications, the location and essential characteristics of the work sites, the quality and quantity of materials, equipment, labor and facilities necessary to perform the services, and any other condition or state of fact which could in any way affect performance of the Contractor's obligations under the Contract. The Contractor hereby releases and holds the City harmless from and against any liability or claim for damages of any kind or nature if the actual site or service conditions differ from expected conditions.

The Contractor shall, at all times, exercise reasonable precautions for the safety of their employees, City Staff, participants and others on or near the City's facilities.

10. **WORKFORCE** This paragraph only applies to the purchase of services to be primarily performed at the City's premises or on City property/right-of-way.

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A. The Contractor shall employ only orderly and competent workers, skilled in the performance of the services which they will perform under the Contract.
B. The Contractor, its employees, Subcontractors, and Subcontractor's employees may not (1) while engaged in, participating, or responding to a solicitation; or (2) while in the course and scope of delivering goods or services under a City of Denton contract; or (3) on the City's property.

i. use or possess a firearm, including a concealed handgun that is licensed under State law, except as required by the terms of the contract; or

ii. use or possess alcoholic or other intoxicating beverages, illegal drugs, or controlled substances, nor may such workers be intoxicated, or under the influence of alcohol or drugs.
C. If the City or the City's representative notifies the Contractor that any worker is incompetent, disorderly or disobedient, has knowingly or repeatedly violated safety regulations, has possessed any firearms, or has possessed or was under the influence of alcohol or drugs, the Contractor shall immediately remove such worker from Contract services, and may not employ such worker again on Contract services without the City's prior written consent.

IMMIGRATION: THE CONTRACTOR REPRESENTS AND WARRANTS THAT IT SHALL COMPLY WITH THE REQUIREMENTS OF THE IMMIGRATION REFORM AND CONTROL ACT OF 1986 AND 1990 REGARDING EMPLOYMENT VERIFICATION AND RETENTION OF VERIFICATION FORMS FOR ANY INDIVIDUALS HIRED ON OR AFTER NOVEMBER 6, 1986, WHO WILL PERFORM ANY LABOR OR SERVICES UNDER THE CONTRACT AND THE ILLEGAL IMMIGRATION REFORM AND IMMIGRANT RESPONSIBILITY ACT OF 1996 ("IIRIRA) ENACTED ON SEPTEMBER 30, 1996, AND SHALL INDEMNIFY AND HOLD THE CITY HARMLESS FROM ANY ACTION ARISING RELATED THERETO.

11. **COMPLIANCE WITH HEALTH, SAFETY, AND ENVIRONMENTAL REGULATIONS**: This paragraph only applies to the purchase of services to be primarily performed at the City's premises or on City property/right-of-way. The Contractor, its Subcontractors, and their respective employees, shall comply fully with all applicable federal, state, and local health, safety, and environmental laws, ordinances, rules, and regulations in the performance of the services, including but not limited to those promulgated by the City and by the Occupational Safety and Health Administration (OSHA). In case of conflict, the most stringent safety requirement shall govern. **THE CONTRACTOR SHALL INDEMNIFY AND HOLD THE CITY HARMLESS FROM AND AGAINST ALL CLAIMS, DEMANDS, SUITS, ACTIONS, JUDGMENTS, FINES, PENALTIES AND LIABILITY OF EVERY KIND ARISING FROM THE BREACH OF THE CONTRACTOR'S OBLIGATIONS UNDER THIS PARAGRAPH.**

Environmental Protection: The Contractor shall be in compliance with all applicable standards, orders, or regulations issued pursuant to the mandates of the Clean Air Act (42 U.S.C. §7401 *et seq*.) and the Federal Water Pollution Control Act, as amended, (33 U.S.C. §1251 *et seq*.).

12. **INVOICES**:
A. The Contractor shall submit separate invoices on each purchase order or purchase release after each delivery. If partial shipments or deliveries are authorized by the City, a separate invoice must be sent for each shipment or delivery made.
B. **Proper Invoices must include a unique invoice number, invoice date, the purchase order number, and the master agreement number if applicable, the Department's Name, and the name of the point of contact for the Department**. Invoices shall be itemized and transportation charges, if any, shall be listed separately. A copy of the bill of lading and the freight waybill, when applicable, shall be attached to the invoice. The Contractor's name, remittance address and, if

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applicable, the tax identification number on the invoice must exactly match the information in the Vendor's registration with the City. Unless otherwise instructed in writing, the City may rely on the remittance address specified on the Contractor's invoice.
C. Invoices for labor shall include a copy of all time-sheets with trade labor rate and deliverables order number clearly identified. Invoices shall also include a tabulation of work-hours at the appropriate rates and grouped by work order number. Time billed for labor shall be limited to hours actually worked at the work site.
D. Unless otherwise expressly authorized in the Contract, the Contractor shall pass through all Subcontract and other authorized expenses at actual cost without markup.
E. Federal excise taxes, State taxes, or City sales taxes must not be included in the invoiced amount. The City will furnish a tax exemption certificate upon request.

13. **PAYMENT**:
A. All proper invoices need to be sent to Accounts Payable – accountspayable@cityofdenton.com. Approved invoices will be paid within thirty (30) calendar days of the invoice being received in Accounts Payable.
B. **If payment is not timely made, (per paragraph A); interest shall accrue on the unpaid balance at the lesser of the rate specified in Texas Government Code Section 2251.025 or the maximum lawful rate; except, if payment is not timely made for a reason for which the City may withhold payment hereunder, including, but not limited to, those in Paragraph D , below, interest shall not accrue until ten (10) calendar days after the grounds for withholding payment have been resolved.**
C. If partial shipments or deliveries are authorized by the City, the Contractor will be paid for the partial shipment or delivery, as stated above, provided that the invoice matches such shipment or delivery.
D. The City may withhold or set off the entire payment or part of any payment otherwise due to the Contractor to such extent as may be necessary on account of:

i. delivery of defective or non-conforming deliverables by the Contractor;
iii. failure of the Contractor to pay Subcontractors, or for labor, materials, or equipment;
iv. to the extent caused by Contractor's negligence, damage to the property of the City or the City's agents, employees, or contractors, which is not covered by insurance required to be provided by the Contractor;
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E. Notice is hereby given to any awarded firm who is in arrears to the City for delinquent taxes of any kind or otherwise indebted to the City that the City shall be entitled to counterclaim and/or offset against any such debt, claim, demand, or account owed to the City through payment withholding until the debt is paid in full, and no assignment of such debt, claim, demand, or account after the said taxes or debt are due shall affect the right of the City to offset the said taxes or debt against same.
F. Payment will be made by check unless the parties mutually agree to payment by credit card or electronic transfer of funds. The Contractor agrees that there shall be no additional charges, surcharges, or penalties to the City for payments made by credit card or electronic funds transfer.
G. The Contractor acknowledges and agrees that the awarding or continuation of this Contract is dependent upon the availability of funding. The City's payment obligations are payable only and solely from funds appropriated and available for this Contract. The absence of appropriated or other lawfully available funds shall render the Contract null and void to the extent funds are not appropriated or available and any deliverables delivered but unpaid shall be returned to the Contractor. The City will not incur a debt or obligation to pay Contractor any amounts the City

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does not have the current funds available to pay. The City shall provide the Contractor written notice of the failure of the City to make an adequate appropriation for any fiscal year to pay the amounts due under the Contract, or the reduction of any appropriation to an amount insufficient to permit the City to pay its obligations under the Contract. In the event of none or inadequate appropriation of funds, there will be no penalty or liability to the City, nor removal fees, cancellation fees, or the like charged to the City.

14. **TRAVEL EXPENSES**: All travel, lodging, and per diem expenses in connection with the Contract shall be paid by the Contractor, unless otherwise stated in the Contract Documents. During the term of this Contract, the Contractor shall bill and the City shall reimburse Contractor for all reasonable and approved out of pocket expenses which are incurred in the connection with the performance of duties hereunder. Notwithstanding the foregoing, expenses for the time spent by the Contractor in traveling to and from City facilities shall not be reimbursed, unless otherwise negotiated.

15. **FINAL PAYMENT AND CLOSE-OUT**:

A. If a DBE/MBE/WBE Program Plan is agreed to and the Contractor has identified Subcontractors, the Contractor is required to submit a Contract Close-Out MBE/WBE Compliance Report to the Purchasing Manager no later than the fifteenth (15^{th}) calendar day after completion of all work under the contract. Final payment, retainage, or both may be withheld if the Contractor is not in compliance with the requirements as accepted by the City.

B. The making and acceptance of final payment will constitute:

i. a waiver of all claims by the City against the Contractor, except claims (1) which have been previously asserted in writing and not yet settled, (2) arising from defective work appearing after final inspection, (3) arising from failure of the Contractor to comply with the Contract or the terms of any warranty specified herein, (4) arising from the Contractor's continuing obligations under the Contract, including but not limited to indemnity and warranty obligations, or (5) arising under the City's right to audit; and

ii. a waiver of all claims by the Contractor against the City other than those previously asserted in writing and not yet settled.

16. **SPECIAL TOOLS & TEST EQUIPMENT**: If the price stated on the Contractor's Offer includes the cost of any special tooling or special test equipment fabricated or required by the Contractor for the purpose of filling this order, such special tooling equipment and any process sheets related thereto shall become the property of the City and shall be identified by the Contractor as such.

17. **RIGHT TO AUDIT**:

A. The Contractor agrees that the City shall, until the expiration of five (5) years after final payment under this Contract unless required to be retained for longer under applicable law, have electronic access to and the right to examine all books, records, and computations pertaining to this Contract. If necessary, the City shall have the right to audit and make copies of the books, records, and computations pertaining to the Contract. The Contractor shall retain such books, records, documents, and other evidence pertaining to the Contract period and five (5) years thereafter, except if an audit is in progress or audit findings are yet unresolved, in which case records shall be kept until all audit tasks are completed and resolved. These books, records, documents, and other evidence shall be available, within ten (10) business days of written request. The cost of the audit will be borne by the City unless the audit reveals an overpayment of 1% or

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greater. If an overpayment of 1% or greater occurs, the reasonable cost of the audit, including any travel costs, must be borne by the Contractor which must be payable within five (5) business days of receipt of an invoice.

B. The Contractor further agrees to include in all its subcontracts hereunder a provision to the effect that the Subcontractor, material supplier, or other payee agrees that the City shall, until the expiration of five (5) years after final payment under the subcontract unless required to be retained for longer under applicable law, have electronic access to and the right to examine all books, records, documents, and other evidence of the Subcontractor, material supplier, or other payee involving transactions relating to the subcontract. If necessary, the City maintains the right to photocopy any physical books, documents, papers, and records of the subconsultant involving transactions relating to the subcontract. All books and records will be made available within a fifty (50) mile radius of the City of Denton. The cost of the audit will be borne by the City unless the audit reveals an overpayment of 1% or greater. If an overpayment of 1% or greater occurs, the reasonable cost of the audit, including any travel costs, must be borne by the Contractor which must be payable within five (5) business days of receipt of an invoice.

C. Failure to comply with the provisions of this section shall be a material breach of the Contract and shall constitute, in the City's sole discretion, grounds for termination thereof. Each of the terms "books", "records", "documents", and "other evidence", as used above, shall be construed to include drafts and electronic files, even if such drafts or electronic files are subsequently used to generate or prepare a final printed document.

18. **SUBCONTRACTORS**:

A. If the Contractor-identified subcontractors ("Subcontractor") in a DBE/MBE/WBE agreed-to plan (the "Plan"), the Contractor shall comply with all requirements approved by the City. The Contractor shall not initially employ any subcontractor except as provided in the Contractor's Plan. The Contractor shall not substitute any Subcontractor identified in the Plan, unless the substitute has been accepted by the City in writing. No acceptance by the City of any subcontractor shall constitute a waiver of any rights or remedies of the City with respect to defective deliverables provided by a Subcontractor. If a Plan has been approved, the Contractor is additionally required to submit a monthly Subcontract Awards and Expenditures Report to the Procurement Manager, no later than the tenth calendar day of each month.

B. Work performed for the Contractor by a Subcontractor shall be pursuant to a written contract between the Contractor and Subcontractor. The terms of the subcontract may not conflict with the terms of the Contract Documents, and shall contain provisions that:

i. require that all deliverables to be provided by the Subcontractor be provided in strict accordance with the provisions, specifications and terms of the Contract;

ii. prohibit the Subcontractor from further subcontracting any portion of the Contract without the prior written consent of the City and the Contractor. The City may require, as a condition to such further subcontracting, that the Subcontractor post a payment bond in form, substance and amount acceptable to the City;

iii. require Subcontractors to submit all invoices and applications for payments, including any claims for additional payments, damages or otherwise, to the Contractor in sufficient time to enable the Contractor to include same with its invoice or application for payment to the City in accordance with the terms of the Contract;

iv. require that all Subcontractors obtain and maintain, throughout the term of their contract, insurance in the type and amounts specified for the Contractor, with the City being

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a named insured as its interest shall appear; and

v. require that the Subcontractor indemnify and hold the City harmless to the same extent as the Contractor is required to indemnify the City.

C. The Contractor shall be fully responsible to the City for all acts and omissions of the Subcontractors just as the Contractor is responsible for the Contractor's own acts and omissions. Nothing in the Contract shall create for the benefit of any such Subcontractor any contractual relationship between the City and any such Subcontractor, nor shall it create any obligation on the part of the City to pay or to see to the payment of any moneys due any such Subcontractor except as may otherwise be required by law.

D. The Contractor shall pay each Subcontractor its appropriate share of payments made to the Contractor not later than ten (10) calendar days after receipt of payment from the City.

19. **WARRANTY-PRICE**:

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B. The Contractor certifies that the prices in the Contractor's Offer have been arrived at independently without consultation, communication, or agreement for the purpose of restricting competition, as to any matter relating to such fees with any other firm or with any competitor.

C. In the event Contractor breaches this warranty, in addition to any other remedy available, the City may deduct from any amounts owed to the Contractor, or otherwise recover, any amounts paid for items in excess of the Contractor's current prices on orders by others for like deliverables under similar terms of purchase, or in the alternative, the City may cancel this Contract without liability to Contractor for breach.

20. **WARRANTY – TITLE**: **The Contractor warrants that it has good and indefeasible title to all deliverables furnished under the Contract, and that the deliverables are free and clear of all liens, claims, security interests, and encumbrances. The Contractor shall indemnify and hold the City harmless from and against all adverse title claims to the deliverables.**

21. **WARRANTY – DELIVERABLES**: Upon Delivery The Contractor represents that all deliverables sold the City under the Contract shall be free from defects in design, workmanship, or manufacture, and conform in all material respects to the specifications, drawings, and descriptions in the Contract Documents, to any samples furnished by the Contractor, to the terms, covenants, and conditions of the Contract, and to all applicable State, federal, or local laws, rules, and regulations, and industry codes and standards. Unless otherwise stated in the Solicitation, the deliverables shall be new or recycled merchandise, and not used or reconditioned. In addition, Contractor warrants that the goods sold to City shall conform to the standards promulgated by the U.S. Department of Labor under the Occupational Safety and Health Act (OSHA). In the event the product does not conform to OSHA standards, City may return the product for correction or replacement at the Contractor's expense. In the event Contractor fails to make the appropriate correction within a reasonable time, correction made by City will be at Contractor's expense.

A. Recycled deliverables shall be clearly identified as such.

B. The Contractor may not limit, exclude, or disclaim the foregoing warranty or any warranty implied by law; and any attempt to do so shall be without force or effect.

C. If upon delivery , one or more of the above warranties are breached, the Contractor shall promptly upon receipt of demand either repair the non-conforming deliverables, or replace the non-conforming deliverables with fully conforming deliverables, at the City's option and at no additional cost to the City. All costs incidental to such repair or replacement, including but not

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limited to, any packaging and shipping costs shall be borne exclusively by the Contractor. The City shall endeavor to give the Contractor written notice of the breach of warranty within thirty (30) calendar days of discovery of the breach of warranty, but failure to give timely notice shall not impair the City's rights under this section.

D. If the Contractor is unable or unwilling to repair or replace defective or non-conforming deliverables as required by the City, then in addition to any other available remedy, the City may reduce the quantity of deliverables it may be required to purchase under the Contract from the Contractor, and purchase conforming deliverables from other sources. In such event, the Contractor shall pay to the City upon demand the increased cost, if any, incurred by the City to procure such deliverables from another source.

E. If the Contractor is not the manufacturer, and the deliverables are covered by a separate manufacturer's warranty, the Contractor shall transfer and assign such manufacturer's warranty to the City. If for any reason the manufacturer's warranty cannot be fully transferred to the City, the Contractor shall assist and cooperate with the City to the fullest extent to enforce such manufacturer's warranty for the benefit of the City.

F. Contractor shall not limit, exclude, or disclaim any implied warranties, and any attempt to do so shall be without force or effect, or alternatively, at the City's option, render this Contract voidable.

22. **WARRANTY – SERVICES**: The Contractor warrants and represents that all services to be provided to the City under the Contract will be fully and timely performed in a good and workmanlike manner in accordance with generally accepted industry standards and practices, the terms, conditions, and covenants of the Contract, and all applicable federal, State, and local laws, rules or regulations.

A. The Contractor may not limit, exclude, or disclaim the foregoing warranty or any warranty implied by law, and any attempt to do so shall be without force or effect, or alternatively, at the City's option, render this Contract voidable.

B. Unless otherwise specified in the Contract, the warranty period shall be at least one (1) year from the date of acceptance of the work. If during the warranty period, one or more of the above warranties are breached, the Contractor shall promptly upon receipt of demand perform the services again in accordance with above standard at no additional cost to the City. All costs incidental to such additional performance shall be borne by the Contractor. The City shall endeavor to give the Contractor written notice of the breach of warranty within thirty (30) calendar days of discovery of the breach warranty, but failure to give timely notice shall not impair the City's rights under this section.

C. If the Contractor is unable or unwilling to perform its services in accordance with the above standard as required by the City, then in addition to any other available remedy, the City may reduce the amount of services it may be required to purchase under the Contract from the Contractor, and purchase conforming services from other sources. In such event, the Contractor shall pay to the City upon demand the increased cost, if any, incurred by the City to procure such services from another source.

23. **ACCEPTANCE OF INCOMPLETE OR NON-CONFORMING DELIVERABLES**: If, instead of requiring immediate correction or removal and replacement of defective or non-conforming deliverables, the City prefers to accept it, the City may do so.

24. **RIGHT TO ASSURANCE**: Whenever one party to the Contract in good faith has reason to question the other party's intent to perform, demand may be made to the other party for written assurance of the intent to perform. In the event that no assurance is given within the time specified

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(being a minimum of 5 days) after demand is made, the demanding party may treat this failure as an anticipatory repudiation of the Contract.

25. **STOP WORK NOTICE**: The City may issue an immediate Stop Work Notice in the event the Contractor is observed performing in a manner that is in violation of federal, State, or local guidelines, or in a manner that is determined by the City to be unsafe to either life or property. Upon notification, the Contractor will cease all work until notified by the City that the violation or unsafe condition has been corrected. The Contractor shall be liable for all costs incurred by the City as a result of the issuance of such Stop Work Notice.

26. **DEFAULT**:
A. The Contractor shall be in default under the Contract if the Contractor (a) fails to fully, timely, and faithfully perform any of its material obligations under the Contract, (b) fails to provide adequate assurance of performance under Paragraph 25, (c) becomes insolvent or seeks relief under the bankruptcy laws of the United States or (d) makes a material misrepresentation in Contractor's Offer, or in any report or deliverable required to be submitted by the Contractor to the City.
B. In the event the City terminates the awarded contract for default , the Contractor shall not be relieved of liability to the City for damages sustained by the City by reason of any default of the contract by the Contractor
27. **TERMINATION FOR CAUSE:** In the event of a default by the Contractor, the City shall have the right to terminate the Contract for cause, by written notice effective ten (10) calendar days, unless otherwise specified, after the date of such notice, unless the Contractor, within such ten (10) day period, cures such default, or provides evidence sufficient to prove to the City's reasonable satisfaction that such default does not, in fact, exist. In addition to any other remedy available under law or in equity, the City shall be entitled to recover all actual damages, costs, losses and expenses, incurred by the City as a result of the Contractor's default, including, without limitation, cost of cover, reasonable attorneys' fees, court costs, and prejudgment and post-judgment interest at the maximum lawful rate. Additionally, in the event of a default by the Contractor, the City may remove the Contractor from the City's vendor list for three (3) years and/or any offer submitted by the Contractor may be disqualified for up to three (3) years. All rights and remedies under the Contract are cumulative and are not exclusive of any other right or remedy provided by law. The requirements of Subchapter J, Chapter 552 of the Texas Government Code, may apply to this Contract and the Contractor agrees that the Contract can be terminated if the Contractor knowingly or intentionally fails to comply with a requirement of that subchapter.

28. **TERMINATION WITHOUT CAUSE**: The City shall have the right to terminate the Contract, in whole or in part, without cause and/or for convenience any time upon thirty (30) calendar days' prior written notice. Upon receipt of a notice of termination, the Contractor shall promptly cease all further work pursuant to the Contract, with such exceptions, if any, specified in the notice of termination. The City shall pay the Contractor, to the extent of funds appropriated or otherwise legally available for such purposes, for all goods delivered and services performed and obligations incurred prior to the date of termination in accordance with the terms hereof, provided such payment amount is not disputed by City. The City reserves all rights, causes of action, and remedies available under law or in equity with respect to any dispute under this Contract and a termination under this provision does not waive such rights, causes of action, and remedies.

29. **FRAUD**: Fraudulent statements by the Contractor in any offer, Contract Document, or in any

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report or deliverable required to be submitted by the Contractor to the City shall be grounds for the termination of the Contract for cause by the City and may result in legal action.

30. **DELAYS**:
A. The City may delay scheduled delivery or other due dates by written notice to the Contractor if the City deems it is in its best interest. If such delay causes an increase in the cost of the work under the Contract, the City and the Contractor shall negotiate an equitable adjustment for costs incurred by the Contractor in the Contract price and execute an amendment to the Contract. The Contractor must assert its right to an adjustment within thirty (30) calendar days from the date of receipt of the notice of delay. Failure to agree on any adjusted price shall be handled under the Dispute Resolution process specified in Paragraph 53. However, nothing in this provision shall excuse the Contractor from delaying the delivery as notified.
B. Neither party shall be liable for any default or delay in the performance of its obligations under this Contract if, while and to the extent such default or delay is caused by acts of God, fire, riots, civil commotion, labor disruptions, sabotage, sovereign conduct, or any other cause beyond the reasonable control of such party. In the event of default or delay in Contract performance due to any of the foregoing causes, then the time for completion of the services will be extended; provided, however, in such an event, a conference will be held within three (3) business days to establish a mutually agreeable period of time reasonably necessary to overcome the effect of such failure to perform.

31. **TIME OF COMPLETION AND LIQUIDATED DAMAGES**: Contractor agrees and acknowledges that completing the services and/or delivering the goods described in this Contract in a timely manner is very important to the City. Contractor agrees to perform all obligations within the timeframes required. As it is impracticable and extremely difficult to fix the actual damages, if any, that may proximately result from a failure by Contractor to provide the goods or perform the service, should Contractor fail to timely perform its obligations, Contractor agrees to pay to City, or have withheld and offset from monies due it, the amount stated in the Contract Documents as liquidated damages for each calendar day of delay or nonperformance. Any sums due and payable hereunder by the Contractor shall be payable, not as a penalty, but as liquidated damages representing an estimate of delay damages likely to be sustained by the City, estimated at the time of executing this Contract. Execution of the Contract shall constitute agreement by the City and Contractor that said amount is the minimum value of the costs and actual damage caused by the Contractor's failure to timely perform. Adjustments to the contract times can only be made as provided in the Contract Documents and any conditions or specifications referenced therein.

32. **INDEMNITY**:
A. Definitions:

i. "Indemnified Claims" shall include any and all claims, demands, suits, causes of action, judgments, and liability , including all reasonable costs and expenses of litigation, mediation, or other alternate dispute resolution mechanism, including attorney and other professional fees for: (1) damage to or loss of the property of any person (including, but not limited to the City, the Contractor, their respective agents, officers, employees and Subcontractors; the officers, agents, and employees of such Subcontractors; and third parties); and/or (2) death, bodily injury, illness, disease, worker's compensation, loss of services, or loss of income or wages to any person (including but not limited to the agents, officers and employees of the City, the Contractor, the Contractor's Subcontractors, and third parties), ii. "Fault" shall mean the sale of defective or non-conforming deliverables,

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negligence, or willful misconduct

B. **THE CONTRACTOR SHALL DEFEND (AT THE OPTION OF THE CITY), INDEMNIFY, AND HOLD THE CITY, ITS SUCCESSORS, ASSIGNS, OFFICERS, EMPLOYEES AND ELECTED OFFICIALS HARMLESS FROM AND AGAINST ALL INDEMNIFIED CLAIMS TO THE EXTENT ARISING OUT OF, INCIDENT TO, CONCERNING OR RESULTING FROM THE FAULT OF THE CONTRACTOR, OR THE CONTRACTOR'S AGENTS, EMPLOYEES OR SUBCONTRACTORS, IN THE PERFORMANCE OF THE CONTRACTOR'S OBLIGATIONS UNDER THE CONTRACT. NOTHING HEREIN SHALL BE DEEMED TO LIMIT THE RIGHTS OF THE CITY OR THE CONTRACTOR (INCLUDING, BUT NOT LIMITED TO, THE RIGHT TO SEEK CONTRIBUTION) AGAINST ANY THIRD PARTY WHO MAY BE LIABLE FOR AN INDEMNIFIED CLAIM.**

33. **LIMITATION OF LIABILITY**: This Contract does not, and shall not be interpreted to, contain an artificial limitation of liability (e.g. liability limited to contract price or liability capped at an amount actually paid in previous 3 months, etc.) or an artificial statute of limitations (e.g. any lawsuit must be commenced within one year of the event).

34. **INSURANCE**: The Contractor shall procure and maintain insurance of the types and in the minimum amounts acceptable to the City of Denton outlined in the Insurance Exhibit attached hereto, if applicable. The insurance shall be written by a company licensed to do business in the State of Texas and satisfactory to the City of Denton. The City of Denton reserves the right to add insurance during the contract term.
B. Specific Coverage Requirements: Specific insurance requirements are contained in the Solicitation and the Insurance Exhibit.

35. **CLAIMS**: If any claim, demand, suit, or other action is asserted against the Contractor which arises under or concerns the Contract, or which could have a material adverse effect on the Contractor's ability to perform thereunder, the Contractor shall give written notice thereof to the City within ten (10) calendar days after receipt of notice by the Contractor. Such notice to the City shall state the date of notification of any such claim, demand, suit, or other action; the names and addresses of the claimant(s); the basis thereof; and the name of each person against whom such claim is being asserted. Such notice shall be delivered personally or by mail and shall be sent to the City and to the Denton City Attorney. Personal delivery to the City Attorney shall be to City Hall, 215 East McKinney Street, Denton, Texas 76201.

36. **NOTICES**: Unless otherwise specified, all notices, requests, or other communications required or appropriate to be given under the Contract shall be in writing and shall be deemed delivered three (3) business days after postmarked if sent by U.S. Postal Service Certified or Registered Mail, Return Receipt Requested. Notices delivered by other means shall be deemed delivered upon receipt by the addressee. Routine communications may be made by first class mail, telefax, or other commercially accepted means. Notices to the Contractor shall be sent to the address specified in the Contractor's Offer, or at such other address as a party may notify the other in writing. Notices to the City shall be addressed to the City at 901B Texas Street, Denton, Texas 76209 and marked to the attention of the Purchasing Manager.

37. **RIGHTS TO BID, PROPOSAL AND CONTRACTUAL MATERIAL**: All material

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submitted by the Contractor to the City shall become property of the City upon receipt. Any portions of such material claimed by the Contractor to be proprietary must be clearly marked as such. Determination of the public nature of the material is subject to the Texas Public Information Act, Chapter 552, and Texas Government Code. The requirements of Subchapter J, Chapter 552 of the Texas Government Code, may apply to this Contract and the Contractor agrees that the Contract can be terminated if the Contractor knowingly or intentionally fails to comply with a requirement of that subchapter.

38. **INDEMNIFICATION AGAINST INFRINGEMENTS**: The Contractor represents and warrants to the City that: (i) the Contractor shall provide the City good and indefeasible title to the deliverables and (ii) the deliverables supplied by the Contractor in accordance with the specifications in the Contract will not infringe, directly or contributorily, any patent, trademark, copyright, trade secret, or any other intellectual property right of any kind of any third party; that no claims have been made by any person or entity with respect to the ownership or operation of the deliverables and the Contractor does not know of any valid basis for any such claims. Moreover, Contractor does not know of any valid basis for any such claims. **THE CONTRACTOR SHALL, AT ITS SOLE EXPENSE, DEFEND, INDEMNIFY, AND HOLD THE CITY HARMLESS FROM AND AGAINST ALL LIABILITY, DAMAGES, AND COSTS (INCLUDING COURT COSTS AND REASONABLE FEES OF ATTORNEYS AND OTHER PROFESSIONALS) ARISING OUT OF OR RESULTING FROM: (I) ANY CLAIM THAT THE CITY'S EXERCISE ANYWHERE IN THE WORLD OF THE RIGHTS ASSOCIATED WITH THE CITY'S' OWNERSHIP, AND IF APPLICABLE, LICENSE RIGHTS, AND ITS USE OF THE DELIVERABLES INFRINGES THE INTELLECTUAL PROPERTY RIGHTS OF ANY THIRD PARTY; OR (II) THE CONTRACTOR'S BREACH OF ANY OF CONTRACTOR'S REPRESENTATIONS OR WARRANTIES STATED IN THIS CONTRACT. IN THE EVENT OF ANY SUCH CLAIM, THE CITY SHALL HAVE THE RIGHT TO MONITOR SUCH CLAIM OR AT ITS OPTION ENGAGE ITS OWN SEPARATE COUNSEL TO ACT AS CO-COUNSEL ON THE CITY'S BEHALF. FURTHER, CONTRACTOR AGREES THAT THE CITY'S SPECIFICATIONS REGARDING THE DELIVERABLES SHALL IN NO WAY DIMINISH CONTRACTOR'S WARRANTIES OR OBLIGATIONS UNDER THIS PARAGRAPH AND THE CITY MAKES NO WARRANTY THAT THE PRODUCTION, DEVELOPMENT, OR DELIVERY OF SUCH DELIVERABLES WILL NOT IMPACT SUCH WARRANTIES OF CONTRACTOR. THIS PARAGRAPH SHALL SURVIVE THE TERMINATION OF THIS CONTRACT.**

39. **CONFIDENTIALITY**: In order to provide the deliverables to the City, Contractor may require access to certain of the City's and/or its licensors' confidential information (including inventions, employee information, trade secrets, confidential know-how, confidential business information, and other information which the City or its licensors consider confidential) (collectively, "Confidential Information"). Contractor acknowledges and agrees that the Confidential Information is the valuable property of the City and/or its licensors and any unauthorized use, disclosure, dissemination, or other release of the Confidential Information will substantially injure the City and/or its licensors. The Contractor (including its employees, subcontractors, agents, or representatives) agrees that it will maintain the Confidential Information in strict confidence and shall not disclose, disseminate, copy, divulge, recreate, or otherwise use the Confidential Information without the prior written consent of the City or in a manner not expressly permitted under this Contract, unless the Confidential Information is required to be disclosed by law or an order of any court or other governmental authority with proper jurisdiction, provided the Contractor promptly notifies the City before disclosing such information so as to permit the City reasonable time to seek an appropriate protective order. The Contractor agrees to

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use protective measures no less stringent than the Contractor uses within its own business to protect its own most valuable information, which protective measures shall under all circumstances be at least reasonable measures to ensure the continued confidentiality of the Confidential Information.

40. **OWNERSHIP AND USE OF DELIVERABLES**: The City shall own all rights, titles, and interests throughout the world in and to the deliverables.

A. Patents. As to any patentable subject matter contained in the deliverables, the Contractor agrees to disclose such patentable subject matter to the City. Further, if requested by the City, the Contractor agrees to assign and, if necessary, cause each of its employees to assign the entire right, title, and interest to specific inventions under such patentable subject matter to the City and to execute, acknowledge, and deliver and, if necessary, cause each of its employees to execute, acknowledge, and deliver an assignment of letters patent, in a form to be reasonably approved by the City, to the City upon request by the City.

B. Copyrights. As to any deliverables containing copyrightable subject matter, the Contractor agrees that upon their creation, such deliverables shall be considered as work made-for-hire by the Contractor for the City and the City shall own all copyrights in and to such deliverables, provided however, that nothing in this Paragraph 41 shall negate the City's sole or joint ownership of any such deliverables arising by virtue of the City's sole or joint authorship of such deliverables. Should by operation of law, such deliverables not be considered works made-for-hire, the Contractor hereby assigns to the City (and agrees to cause each of its employees providing services to the City hereunder to execute, acknowledge, and deliver an assignment to the City of) all worldwide right, title, and interest in and to such deliverables. With respect to such work made-for-hire, the Contractor agrees to execute, acknowledge, and deliver and cause each of its employees providing services to the City hereunder to execute, acknowledge, and deliver a work-made-for-hire agreement, in a form to be reasonably approved by the City, to the City upon delivery of such deliverables to the City or at such other time as the City may request.

C. Additional Assignments. The Contractor further agrees to, and if applicable, cause each of its employees to, execute, acknowledge, and deliver all applications, specifications, oaths, assignments, and all other instruments which the City might reasonably deem necessary in order to apply for and obtain copyright protection, mask work registration, trademark registration and/or protection, letters patent, or any similar rights in any and all countries and in order to assign and convey to the City, its successors, assigns and nominees, the sole and exclusive right, title, and interest in and to the deliverables. The Contractor's obligations to execute, acknowledge, and deliver (or cause to be executed, acknowledged, and delivered) instruments or papers such as those described in this Paragraph 41 A., B., and C. shall continue after the termination of this Contract with respect to such deliverables. In the event the City should not seek to obtain copyright protection, mask work registration or patent protection for any of the deliverables, but should desire to keep the same secret, the Contractor agrees to treat the same as Confidential Information under the terms of Paragraph 40 above.

41. **PUBLICATIONS**: All published material and written reports submitted under the Contract must be originally developed material unless otherwise specifically provided in the Contract. When material not originally developed is included in a report in any form, the source shall be identified.

42. **ADVERTISING**: The Contractor shall not advertise or publish, without the City's prior consent, the fact that the City has entered into the Contract, except to the extent necessary to comply with proper requests for information from an authorized representative of the federal,

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State, or local government.

43. **NO CONTINGENT FEES**: The Contractor warrants that no person or selling agency has been employed or retained to solicit or secure the Contract upon any agreement or understanding for commission, percentage, brokerage, or contingent fee, excepting bona fide employees of bona fide established commercial or selling agencies maintained by the Contractor for the purpose of securing business. For breach or violation of this warranty, the City shall have the right, in addition to any other remedy available, to cancel the Contract without liability and to deduct from any amounts owed to the Contractor, or otherwise recover, the full amount of such commission, percentage, brokerage or contingent fee.

44. **GRATUITIES**: The City may, by written notice to the Contractor, cancel the Contract without liability if it is determined by the City that gratuities were offered or given by the Contractor or any agent or representative of the Contractor to any officer or employee of the City of Denton with a view toward securing the Contract or securing favorable treatment with respect to the awarding or amending or the making of any determinations with respect to the performing of such contract. In the event the Contract is canceled by the City pursuant to this provision, the City shall be entitled, in addition to any other rights and remedies, to recover or withhold the amount of the cost incurred by the Contractor in providing such gratuities.

45. **PROHIBITION AGAINST PERSONAL INTEREST IN CONTRACTS**: The Contractor agrees to comply with the conflict of interest provisions of the City of Denton Code of Ordinances and/or State law. No officer, employee, independent consultant, or elected official of the City who is involved in the development, evaluation, or decision-making process of the performance of any solicitation shall have a financial interest, direct or indirect, in the Contract resulting from that solicitation as defined in the City's Ethic Ordinance codified at Chapter 2, Article XI and in the City Charter Section 14.04, as amended. Any willful violation of this section shall constitute impropriety in office, and any officer or employee guilty thereof shall be subject to disciplinary action up to and including dismissal. Any violation of this provision, with the knowledge, expressed or implied, of the Contractor shall render the Contract voidable by the City. The Contractor shall complete and submit the City's Conflict of Interest Questionnaire. The Contractor agrees to maintain current, updated disclosure of information on file with the Procurement Department throughout the term of this Contract.

46. **NO SUBCONTRACTING BID AFTER AWARD**: Following the award of the Contract, no subcontracting except that specifically identified in the response to the Solicitation will be permitted without the express prior written consent of the City.

47. **NO GIFT OF PUBLIC PROPERTY**: The City will not agree to any terms or conditions that cause the City to lend its credit or grant public money or anything of value to the selected Contractor.

48. **INDEPENDENT CONTRACTOR**: The Contract shall not be construed as creating an employer/employee relationship, a partnership, or a joint venture. The Contractor's services shall be those of an independent contractor. The Contractor agrees and understands that the Contract does not grant any rights or privileges established for employees of the City of Denton, Texas for the purposes of income tax, withholding, social security taxes, vacation or sick leave benefits, worker's compensation, or any other City employee benefit. The City shall not have supervision and

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control of the Contractor or any employee of the Contractor, and it is expressly understood that Contractor shall perform the services hereunder according to the attached specifications at the general direction of the City Manager of the City of Denton, Texas, or their designee under this Contract. The Contractor is expressly free to advertise and perform services for other parties while performing services for the City.

49. **ASSIGNMENT-DELEGATION**: The Contract shall be binding upon and enure to the benefit of the City and the Contractor and their respective successors and assigns, provided however, that no right or interest in the Contract shall be assigned and no obligation shall be delegated by the Contractor without the prior written consent of the City. Any attempted assignment or delegation by the Contractor shall be void unless made in conformity with this Paragraph. The Contract is not intended to confer rights or benefits on any person, firm or entity not a party hereto; it being the intention of the parties that there are no third party beneficiaries to the Contract.
The Vendor shall notify the City's Purchasing Manager, in writing, of a company name, ownership, or address change for the purpose of maintaining updated City records. The president of the company or authorized official must sign the letter. A letter indicating changes in a company name or ownership must be accompanied with supporting legal documentation such as an updated W-9, documents filed with the state indicating such change, copy of the board of director's resolution approving the action, or an executed merger or acquisition agreement. Failure to do so may adversely impact future invoice payments.

50. **WAIVER**: No claim or right arising out of a breach of the Contract can be discharged in whole or in part by a waiver or renunciation of the claim or right unless the waiver or renunciation is supported by consideration and is in writing signed by the aggrieved party. No waiver by either the Contractor or the City of any one or more events of default by the other party shall operate as, or be construed to be, a permanent waiver of any rights or obligations under the Contract, or an express or implied acceptance of any other existing or future default or defaults, whether of a similar or different character. No delay, failure, or waiver of either party's exercise or partial exercise of any right or remedy under the Contract shall operate to limit, impair, preclude, cancel, waive or otherwise affect such right or remedy.

51. **MODIFICATIONS**: The Contract can be modified or amended only by a writing signed by both parties. No pre-printed or similar terms on any the Contractor invoice, order or other document submitted to the City by Contractor shall have any force or effect to change the terms, covenants, and conditions of the Contract.

52. **INTERPRETATION**: The Contract is intended by the parties as a final, complete and exclusive statement of the terms of their agreement. No course of prior dealing between the parties or course of performance or usage of the trade shall be relevant to supplement or explain any term used in the Contract. Acceptance or acquiescence in a course of performance rendered under this Contract shall not be relevant to determine the meaning of this agreement even though the accepting or acquiescing party has knowledge of the performance and opportunity for objection. Although the Contract may have been substantially drafted by one party, it is the intent of the parties that all provisions be construed in a manner to be fair to both parties, reading no provisions more strictly against one party or the other. Whenever a term defined by the Uniform Commercial Code, as enacted by the State of Texas, is used in the Contract, the UCC definition shall control, unless otherwise defined in the Contract.

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53. **DISPUTE RESOLUTION**:
A. If a dispute arises out of or relates to the Contract, or the breach thereof, the parties agree to negotiate prior to prosecuting a suit for damages. However, this section does not prohibit the filing of a lawsuit to toll the running of a statute of limitations or to seek injunctive relief. Either party may make a written request for a meeting between representatives of each party within fourteen (14) calendar days after receipt of the request or such later period as agreed by the parties. Each party shall include, at a minimum, one (1) senior level individual with decision-making authority regarding the dispute, however any decision requiring approval of the City Council of the City will be required to be submitted to the City Council and the senior level person shall have authority to recommend approval of any resolution. The purpose of this and any subsequent meeting is to attempt in good faith to negotiate a resolution of the dispute. If, within thirty (30) calendar days after such meeting, the parties have not succeeded in negotiating a resolution of the dispute, they will proceed directly to mediation as described below. Negotiation may be waived by a written agreement signed by both parties, in which event the parties may proceed directly to mediation as described below.
B. If the efforts to resolve the dispute through negotiation fail, or the parties waive the negotiation process, the parties may select, within thirty (30) calendar days, a mediator trained in mediation skills to assist with resolution of the dispute. Should they choose this option; the City and the Contractor agree to act in good faith in the selection of the mediator and to give consideration to qualified individuals nominated to act as mediator. Nothing in the Contract prevents the parties from relying on the skills of a person who is trained in the subject matter of the dispute or a contract interpretation expert. If the parties fail to agree on a mediator within thirty (30) calendar days of initiation of the mediation process, the mediator shall be selected by the Denton County Alternative Dispute Resolution Program (DCAP). The parties agree to participate in mediation in good faith for up to thirty (30) calendar days from the date of the first mediation session. The City and the Contractor will share the mediator's fees equally and the parties will bear their own costs of participation such as fees for any consultants or attorneys they may utilize to represent them or otherwise assist them in the mediation.
C. The parties shall not be required to submit to binding arbitration.

54. **JURISDICTION AND VENUE**: The Contract is made under and shall be governed by the laws of the State of Texas, including, when applicable, the Uniform Commercial Code as adopted in Texas, V.T.C.A., Bus. & Comm. Code, Chapter 1, excluding any rule or principle that would refer to and apply the substantive law of another state or jurisdiction. All issues arising from this Contract shall be resolved in the courts of Denton County, Texas and the parties agree to submit to the exclusive personal jurisdiction of such courts. The foregoing, however, shall not be construed or interpreted to limit or restrict the right or ability of the City to seek and secure injunctive relief from any competent authority as contemplated herein.

55. **INVALIDITY**: The invalidity, illegality, or unenforceability of any provision of the Contract shall in no way affect the validity or enforceability of any other portion or provision of the Contract. Any void provision shall be deemed severed from the Contract and the balance of the Contract shall be construed and enforced as if the Contract did not contain the particular portion or provision held to be void. The parties further agree to reform the Contract to replace any stricken provision with a valid provision that comes as close as possible to the intent of the stricken provision. The provisions of this section shall not prevent this entire Contract from being void should a provision which is the essence of the Contract be determined to be void.

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56. **HOLIDAYS:** The following holidays are observed by the City:

New Year's Day (observed)
Martin Luther King, Jr. Day
Memorial Day
Juneteenth
Independence Day
Labor Day
Veteran's Day
Thanksgiving Day
Friday After Thanksgiving
Christmas Eve (observed)
Christmas Day (observed)

If a Legal Holiday falls on Saturday, it will be observed on the preceding Friday. If a Legal Holiday falls on Sunday, it will be observed on the following Monday. Normal hours of operation shall be between 8:00 am and 4:00 pm, Monday through Friday, excluding City of Denton Holidays. Any scheduled deliveries or work performance not within the normal hours of operation **must be approved** by the City Manager of Denton, Texas or their authorized designee.

57. **SURVIVABILITY OF OBLIGATIONS:** All provisions of the Contract that impose continuing obligations on the parties, including but not limited to the warranty, indemnity, and confidentiality obligations of the parties, shall survive the expiration or termination of the Contract for fifteen (15) years.

58. **NON-SUSPENSION OR DEBARMENT CERTIFICATION:**
The City of Denton is prohibited from contracting with or making prime or sub-awards to parties that are suspended or debarred or whose principals are suspended or debarred from Federal, State, or City of Denton Contracts. By accepting a Contract with the City, the Vendor certifies that its firm and its principals are not currently suspended or debarred from doing business with the Federal Government, as indicated by the General Services Administration List of Parties Excluded from Federal Procurement and Non-Procurement Programs, the State of Texas, or the City of Denton.

59. **EQUAL OPPORTUNITY** Contractor agrees that during the performance of its contract it will:
A. Treat all applicants and employees without discrimination as to race, color, religion, sex, national origin, marital status, age, or handicap.
B. Identify itself as an "Equal Opportunity Employer" in all help wanted advertising or request. The Contractor shall be advised of any complaints filed with the City alleging that Contractor is not an Equal Opportunity Employer. The City reserves the right to consider its reports from its human relations administrator in response to such complaints in determining whether or not to terminate any portion of this contract for which purchase orders or authorities to deliver have not been included, however, the Contractor is specifically advised that no Equal Opportunity Employment complaint will be the basis for cancellation of this contract for which a purchase order has been issued or authority to deliver granted.
C. **Americans with Disabilities Act (ADA) Compliance:** No Contractor, or Contractor's agent,

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shall engage in any discriminatory employment practice against individuals with disabilities as defined
in the ADA.

60. **BUY AMERICAN ACT-SUPPLIES (Applicable to certain federally funded requirements)**
The following federally funded requirements are applicable. A. Definitions. As used in this paragraph –
i. "Component" means an article, material, or supply incorporated directly into an end product.
ii. "Cost of components" means -
(1) For components purchased by the Contractor, the acquisition cost, including transportation costs to the place of incorporation into the end product (whether or not such costs are paid to a domestic firm), and any applicable duty (whether or not a duty-free entry certificate is issued); or
(2) For components manufactured by the Contractor, all costs associated with the manufacture of the component, including transportation costs as described in paragraph (1) of this definition, plus allocable overhead costs, but excluding profit. Cost of components does not include any costs associated with the manufacture of the end product.
iii. "Domestic end product" means-
(1) An unmanufactured end product mined or produced in the United States; or
(2) An end product manufactured in the United States, if the cost of its components mined, produced, or manufactured in the United States exceeds 50 percent of the cost of all its components. Components of foreign origin of the same class or kind as those that the agency determines are not mined, produced, or manufactured in sufficient and reasonably available commercial quantities of a satisfactory quality are treated as domestic. Scrap generated, collected, and prepared for processing in the United States is considered domestic.
iv. "End product" means those articles, materials, and supplies to be acquired under the contract for public use.
v. "Foreign end product" means an end product other than a domestic end product.
vi. "United States" means the 50 States, the District of Columbia, and outlying areas.
B. The Buy American Act (41 U.S.C. 10a - 10d) provides a preference for domestic end products for supplies acquired for use in the United States.
C. The City does not maintain a list of foreign articles that will be treated as domestic for this Contract; but will consider for approval foreign articles as domestic for this product if the articles are on a list approved by another Governmental Agency. The Contractor shall submit documentation with their offer demonstrating that the article is on an approved Governmental list.
D. The Contractor shall deliver only domestic end products except to the extent that it specified delivery of foreign end products in the provision of the Solicitation entitled "Buy American Act Certificate".

61. **RIGHT TO INFORMATION:** The City of Denton reserves the right to use any and all information presented in any response to this Contract, whether amended or not, except as prohibited by law. Selection of rejection of the submittal does not affect this right.

62. **LICENSE FEES OR TAXES:** Provided the solicitation requires an awarded contractor or supplier to be licensed by the State of Texas, any and all fees and taxes are the responsibility of the respondent.

63. **PREVAILING WAGE RATES:** The Contractor shall comply with prevailing wage rates as

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defined by the United States Department of Labor Davis-Bacon Wage Determination at http://www.dol.gov/whd/contracts/dbra.htm and at the Wage Determinations website www.wdol.gov for Denton County, Texas (WD-2509).

64. **COMPLIANCE WITH ALL STATE, FEDERAL, AND LOCAL LAWS:** The Contractor or supplier shall comply with all State, federal, and local laws and requirements. The Contractor must comply with all applicable laws at all times, including, without limitation, the following: (i) §36.02 of the Texas Penal Code, which prohibits bribery; (ii) §36.09 of the Texas Penal Code, which prohibits the offering or conferring of benefits to public servants; and (iii) Chapter 552 of the Texas Government Code, which outlines policy for public information. The Contractor shall give all notices and comply with all laws and regulations applicable to furnishing and performance of the Contract.

65. **FEDERAL, STATE, AND LOCAL REQUIREMENTS:** Contractor shall demonstrate on-site compliance with the provisions of federal law dealing with issuance of Form W-2's to common law employees. Contractor is responsible for both federal and State unemployment insurance coverage and standard Workers' Compensation insurance coverage. Contractor shall ensure compliance with all federal and State tax laws and withholding requirements. The City of Denton shall not be liable to Contractor or its employees for any Unemployment or Workers' Compensation coverage, or federal or State withholding requirements. Contractor shall indemnify the City of Denton and shall pay all costs, penalties, or losses resulting from Contractor's omission or breach of this Section.

66. **ATTORNEY'S FEES; LEGAL COSTS:** Contractor and City agree that the City will not be required to pay Contractor's attorney's fees or legal costs under any circumstances, unless expressly required by law.

67. **DRUG FREE WORKPLACE:** The Contractor shall comply with the applicable provisions of the Drug-Free Work Place Act of 1988 (Public Law 100-690, Title V, Subtitle D; 41 U.S.C. 701 ET SEQ.) and maintain a drug-free work environment; and the final rule, government-wide requirements for drug-free work place (grants), issued by the Office of Management and Budget and the Department of Defense (32 CFR Part 280, Subpart F) to implement the provisions of the Drug-Free Work Place Act of 1988 is incorporated by reference and the Contractor shall comply with the relevant provisions thereof, including any amendments to the final rule that may hereafter be issued.

68. **CONTRACTOR LIABILITY FOR DAMAGE TO GOVERNMENT PROPERTY:** The Contractor shall be liable for all damages to government-owned, leased, or occupied property and equipment caused by the Contractor and its employees, agents, subcontractors, and suppliers, including any delivery or cartage company, in connection with any performance pursuant to the Contract. The Contractor shall notify the City of Denton Procurement Manager in writing of any such damage within one (1) calendar day.

69. **FORCE MAJEURE:** The City of Denton, any Customer, and the Contractor shall not be responsible for performance under the Contract should it be prevented from performance by an act of war, order of legal authority, act of God, or other unavoidable cause not attributable to the fault or negligence of the City of Denton. In the event of an occurrence under this Section, the Contractor will be excused from any further performance or observance of the requirements so

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affected for as long as such circumstances prevail and the Contractor continues to use commercially reasonable efforts to recommence performance or observance whenever and to whatever extent possible without delay. The Contractor shall immediately notify the City of Denton Procurement Manager by telephone (to be confirmed in writing within five (5) calendar days of the inception of such occurrence) and describe at a reasonable level of detail the circumstances causing the non-performance or delay in performance.

70. **NON-WAIVER OF RIGHTS:** Failure of a Party to require performance by another Party under the Contract will not affect the right of such Party to require performance in the future. No delay, failure, or waiver of either Party's exercise or partial exercise of any right or remedy under the Contract shall operate to limit, impair, preclude, cancel, waive or otherwise affect such right or remedy. A waiver by a Party of any breach of any term of the Contract will not be construed as a waiver of any continuing or succeeding breach.

71. **NO WAIVER OF SOVEREIGN IMMUNITY:** The Parties expressly agree that no provision of the Contract is in any way intended to constitute a waiver by the City of Denton of any immunities from suit or from liability that the City of Denton may have by operation of law.

72. **RECORDS RETENTION:** The Contractor shall retain all financial records, supporting documents, statistical records, and any other records or books relating to the performances called for in the Contract. The Contractor shall retain all such records for a period of four (4) years after the expiration of the Contract, or until the CPA or State Auditor's Office is satisfied that all audit and litigation matters are resolved, whichever period is longer. The Contractor shall grant access to all books, records and documents pertinent to the Contract to the CPA, the State Auditor of Texas, and any federal governmental entity that has authority to review records due to federal funds being spent under the Contract. In the event the value of this Contract is One Million ($1,000,000) Dollars or greater: (i) all contracting information related to this contract will be preserved for the duration of the Contact; (ii) the Contractor shall provide any contracting information in its possession promptly upon request by the City; and (iii) at the expiration of this Contract, the Contractor will either provide all contracting information in its possession to the City or preserve same as required by the record retention requirements of the State of Texas.

73. **PROCUREMENT LAWS**: The City will not agree to any terms or conditions that cause the City to violate any federal, State, or local procurement laws, including its own Charter or Procurement Policy and any such laws included in boilerplate terms, online terms or other terms provided by the Contractor are considered null and void.

74. **AUTHORITY**: Contractor represents and warrants to the other that (a) it has company authority to execute and perform this Contract; (b) executing this Contract does not constitute a material conflict with, breach, or default under any applicable law, its respective organizational documents, or any documents, agreements, contracts or instruments which are binding upon it; and (c) this Contract creates valid, legal, and binding obligation enforceable against it, subject to applicable insolvency and bankruptcy laws. Contractor recognizes and agrees that a violation of this provision constitutes a material breach under this Contract.

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Exhibit D
Certificate of Interested Parties Electronic Filing

In 2015, the Texas Legislature adopted House Bill 1295, which added section 2252.908 of the Government Code. The law states that the City may not enter into this contract unless the Contractor submits a disclosure of interested parties (Form 1295) to the City at the time the Contractor submits the signed contract. The Texas Ethics Commission has adopted rules requiring the business entity to file Form 1295 electronically with the Commission.

Contractor will be required to furnish a Certificate of Interest Parties before the Contract is awarded, in accordance with Government Code 2252.908.

The Contractor shall:

1. Log onto the State Ethics Commission Website at :https://www.ethics.state.tx.us/filinginfo/1295/
2. Register utilizing the tutorial provided by the State
3. Print a copy of the completed Form 1295
4. Enter the Certificate Number on page 2 of this contract.
5. Complete and sign the Form 1295
6. Email the form to purchasing@cityofdenton.com with the contract number in the subject line. (EX: Contract 1234 – Form 1295)

The City must acknowledge the receipt of the filed Form 1295 not later than the 30th day after Council award. Once a Form 1295 is acknowledged, it will be posted to the Texas Ethics Commission's website within seven business days.

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Exhibit E

INSURANCE REQUIREMENTS

Respondent's attention is directed to the insurance requirements below. It is highly recommended that respondents confer with their respective insurance carriers or brokers to determine in advance of Proposal/Bid submission the availability of insurance certificates and endorsements as prescribed and provided herein. If an apparent low respondent fails to comply strictly with the insurance requirements, that respondent may be disqualified from award of the contract. Upon contract award, all insurance requirements shall become contractual obligations, which the successful contractor shall have a duty to maintain throughout the course of this contract.

STANDARD PROVISIONS:

Without limiting any of the other obligations or liabilities of the Contractor, the Contractor shall provide and maintain until the contracted work has been completed and accepted by the City of Denton, Owner, the minimum insurance coverage as indicated hereinafter.

As soon as practicable after notification of contract award, Contractor shall file with the Purchasing Department satisfactory certificates of insurance including any applicable addendum or endorsements, containing the contract number and title of the project. Contractor may, upon written request to the Purchasing Department, ask for clarification of any insurance requirements at any time; however, Contractors are strongly advised to make such requests prior to proposal/bid opening, since the insurance requirements may not be modified or waived after proposal/bid opening unless a written exception has been submitted with the proposal/bid. Contractor shall not commence any work or deliver any material until he or she receives notification that the contract has been accepted, approved, and signed by the City of Denton.

All insurance policies proposed or obtained in satisfaction of these requirements shall comply with the following general specifications, and shall be maintained in compliance with these general specifications throughout the duration of the Contract, or longer, if so noted:

- Each policy shall be issued by a company authorized to do business in the State of Texas with an A.M. Best Company rating of at least **A- or better**.

- Any deductibles or self-insured retentions shall be declared in the proposal. If requested by the City, the insurer shall reduce or eliminate such deductibles or self-insured retentions with respect to the City, its officials, agents, employees and volunteers; or, the contractor shall procure a bond guaranteeing payment of losses and related investigations, claim administration and defense expenses.

- Liability policies shall be endorsed to provide the following:

    - Name as Additional Insured the City of Denton, its Officials, Agents,

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Employees and volunteers.

- That such insurance is primary to any other insurance available to the Additional Insured with respect to claims covered under the policy and that this insurance applies separately to each insured against whom claim is made or suit is brought. The inclusion of more than one insured shall not operate to increase the insurer's limit of liability.

- Provide a Waiver of Subrogation in favor of the City of Denton, its officials, agents, employees, and volunteers.

- ***Cancellation: City requires 30 day written notice should any of the policies described on the certificate be cancelled or materially changed before the expiration date.***

- Should any of the required insurance be provided under a claims made form, Contractor shall maintain such coverage continuously throughout the term of this contract and, without lapse, for a period of three years beyond the contract expiration, such that occurrences arising during the contract term which give rise to claims made after expiration of the contract shall be covered.

- Should any of the required insurance be provided under a form of coverage that includes a general annual aggregate limit providing for claims investigation or legal defense costs to be included in the general annual aggregate limit, the Contractor shall either double the occurrence limits or obtain Owners and Contractors Protective Liability Insurance.

- Should any required insurance lapse during the contract term, requests for payments originating after such lapse shall not be processed until the City receives satisfactory evidence of reinstated coverage as required by this contract, effective as of the lapse date. If insurance is not reinstated, City may, at its sole option, terminate this agreement effective on the date of the lapse.

SPECIFIC ADDITIONAL INSURANCE REQUIREMENTS:

All insurance policies proposed or obtained in satisfaction of this Contract shall additionally comply with the following specifications, and shall be maintained in compliance with these additional specifications throughout the duration of the Contract, or longer, if so noted:

A. <u>COMMERCIAL GENERAL LIABILITY INSURANCE</u>

Commercial General Liability Insurance including, but not limited to, Premises/Operations, Personal & Advertising Injury, Products/Completed Operations, Independent Contractors, and Contractual Liability with minimum combined bodily injury (including death) and property damage limits of

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$1,000,000.00 per occurrence and $2,000,000.00 general aggregate.

B. WORKERS' COMPENSATION and EMPLOYERS LIABILITY INSURANCE

Workers' Compensation within the regulations of the Texas Workers' Compensation Act. The minimum policy limits for **Employers Liability** are:

Bodily Injury by Accident: $100,000.00 Each Accident
Bodily Injury by Disease: $100,000.00 Each Employee
Bodily Injury by Disease: $500,000.00 Policy Limit

NOTES:

a. If CONTRACTOR will not be providing services under the contract at a City facility, has no employees and/or is operating as a sole owner and single operator, CONTRACTOR shall provide a signed letter, with the current date, on official letterhead stating such to meet the requirement.

b. If CONTRACTOR is a non-subscriber or is self-insured CONTRACTOR shall provide a copy of its Certificate of Authority to Self-Insure from the Texas Department of Insurance, Division of Workers' Compensation Self Insurance Regulation Program, evidence of alternative coverage and internal safety and injury coverage policies and procedures.

C. BUSINESS AUTOMOBILE LIABILITY INSURANCE

Business Automobile Liability Insurance covering owned, hired, and non-owned vehicles, with a minimum combined single limit for bodily injury (including death) and property damage limit of $500,000.00 per occurrence. The policy must include a MCS-90 endorsement.

NOTE:

a. If CONTRACTOR does not have owned, hired and non-owned autos or vehicles and/or no autos or vehicles will not be used in the performance of services under the contract, CONTRACTOR shall provide a signed letter, with the current date, on official letterhead stating such to meet the requirement for owned autos.

D. ENVIRONMENTAL IMPAIRMENT/POLLUTION INSURANCE

Environmental Impairment/Pollution Insurance to include coverage for the handling, receiving, dispensing, removal, storage, testing, transportation, disposal, discharge, dispersal release or escape of any hazardous material into or upon land, or any structure on land, the atmosphere or any watercourse or body of water, including ground water, with a minimum combined bodily injury (including death) and property damage limit of $1,000,000 per occurrence.

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	Exhibit F- Contractor's Proposal			**Tanner Industries, Inc.**
Line #	**Description**	**QTY**	**UOM**	**Unit**
1	SECTION A WATER TREATMENT CHEMICALS			
2	Anhydrous Ammonia 99.995 % Grade (approximately 2,000 Lb. Shipments)	47563	lbs	$0.98

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CONFLICT OF INTEREST QUESTIONNAIRE - FORM CIQ

For vendor or other person doing business with local governmental entity

This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code, by a vendor who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the vendor meets requirements under Section 176.006(a) and by City of Denton Ethics Code, Ordinance 18-757.
By law this questionnaire must be filed with the records administrator of the local government entity not later than the 7th business day after the date the vendor becomes aware of facts that require the statement to be filed. *See* Section 176.006(a-1), Local Government Code.

A vendor commits an offense if the vendor knowingly violates Section 176.006, Local Government Code. An offense under this section is a misdemeanor.

1 **Name of vendor who has a business relationship with local governmental entity.**

Tanner Industries, Inc.

2 ☐ **Check this box if you are filing an update to a previously filed questionnaire.**

(The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date on which you became aware that the originally filed questionnaire was incomplete or inaccurate.)

3 **Name of local government officer about whom the information in this section is being disclosed.**

_____
Name of Officer

Describe each employment or other business relationship with the local government officer, or a family member of the officer, as described by Section 176.003(a)(2)(A). Also describe any family relations hip with the local government officer. This section, (item 3 including subparts A, B, C & D), must be completed for each officer with whom the vendor has an employment or other business relationship as defined by Section 176.001(1-a), Local Government Code. Attach additional pages to this Form CIQ as necessary.

A. Is the local government officer named in this section receiving or likely to receive taxable income, other than investment income, from the vendor?

☐ Yes ☐ No

B. Is the vendor receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer named in this section AND the taxable income is not received from the local governmental entity?

☐ Yes ☐ No

C. Is the filer of this questionnaire employed by a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership of one percent or more?

☐ Yes ☐ No

D. Describe each employment or business and family relationship with the local government officer named in this section.

4 ☒ **I have no Conflict of Interest to disclose.**

5 Signed by: Matt Tanner C8B0C8E4CD1E4E9...

Signature of vendor doing business with the governmental entity

11/19/2025
Date

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CONFLICT OF INTEREST QUESTIONNAIRE
For vendor doing business with local governmental entity

A complete copy of Chapter 176 of the Local Government Code may be found at http://www.statutes.legis.state.tx.us/ Docs/LG/htm/LG.176.htm. For easy reference, below are some of the sections cited on this form.

Local Government Code § 176.001(1-a): "Business relationship" means a connection between two or more parties based on commercial activity of one of the parties. The term does not include a connection based on:

(A) a transaction that is subject to rate or fee regulation by a federal, state, or local governmental entity or an agency of a federal, state, or local governmental entity;

(B) a transaction conducted at a price and subject to terms available to the public; or

(C) a purchase or lease of goods or services from a person that is chartered by a state or federal agency and that is subject to regular examination by, and reporting to, that agency.

Local Government Code § 176.003(a)(2)(A) and (B):

(A) A local government officer shall file a conflicts disclosure statement with respect to a vendor if:

(2) the vendor:

(A) has an employment or other business relationship with the local government officer or a family member of the officer that results in the officer or family member receiving taxable income, other than investment income, that exceeds $2,500 during the 12-month period preceding the date that the officer becomes aware that

(i) a contract between the local governmental entity and vendor has been executed; or

(ii) the local governmental entity is considering entering into a contract with the vendor;

(B) has given to the local government officer or a family member of the officer one or more gifts that have an aggregate value of more than $100 in the 12-month period preceding the date the officer becomes aware that:

(i) a contract between the local governmental entity and vendor has been executed; or

(ii) the local governmental entity is considering entering into a contract with the vendor.

Local Government Code § 176.006(a) and (a-1)

(a) A vendor shall file a completed conflict of interest questionnaire if the vendor has a business relationship with a local governmental entity and:

(1) has an employment or other business relationship with a local government officer of that local governmental entity, or a family member of the officer, described by Section 176.003(a)(2)(A);

(2) has given a local government officer of that local governmental entity, or a family member of the officer, one or more gifts with the aggregate value specified by Section 176.003(a)(2)(B), excluding any gift described by Section 176.003(a-1); or

(3) has a family relationship with a local government officer of that local governmental entity.

(a-1) The completed conflict of interest questionnaire must be filed with the appropriate records administrator not later than the seventh business day after the later of:

(1) the date that the vendor:

(A) begins discussions or negotiations to enter into a contract with the local governmental entity; or

(B) submits to the local governmental entity an application, response to a request for proposals or bids, correspondence, or another writing related to a potential contract with the local governmental entity; or

(2) the date the vendor becomes aware:

(A) of an employment or other business relationship with a local government officer, or a family member of the officer, described by Subsection (a);

(B) that the vendor has given one or more gifts described by Subsection (a); or

(C) of a family relationship with a local government officer.

City of Denton Ethics Code Ordinance Number 18-757

Definitions:

Relative: a family member related to a City Official within the third 3rd degree of affinity (marriage) or consanguinity (blood or adoption)

City Official: for purpose of this article, the term consists of the Council Members, Department Heads, or member of the Board of Ethics, Planning and zoning Commission Members, Board of Adjustment, Historic Landmark Commission, or Public Utilities Board

Vendor: a person who provides or seeks to provide goods, services, and/or real property to the City in exchange for compensation. This definition does not include those property owners from whom the City acquires public right-of-way or other real property interests for public use.

Per the City of Denton Ethics Code, Section 2-273. – Prohibitions

(3) It shall be a violation of this Article for a Vendor to offer or give a Gift to City Official exceeding fifty dollars ($50.00) per gift, or multiple gifts cumulatively valued at more than two hundred dollars ($200.00) per a single fiscal year.

Per the City of Denton Ethics Code, Section 2-282. – Disposition (b), (5) Ineligibility

If the Board of Ethics finds that a Vendor has violated this Article, the Board may recommend to the City Manager that the Vendor be deemed ineligible to enter into a City contract or other arrangement for goods, services, or real property, for a period of one (1) year.

Certificate Of Completion

Envelope Id: A62ED0E9-0BEB-4D7C-966E-8FF8554B308D
Status: Sent
Subject: Please DocuSign: City Council Contract 8823-1 Supply of Anhydrous Ammonia
Source Envelope:
Document Pages: 33
Signatures: 4
Certificate Pages: 6
Initials: 1
AutoNav: Enabled
EnvelopeId Stamping: Enabled
Time Zone: (UTC-06:00) Central Time (US & Canada)

Envelope Originator:
Gabby Leeper
901B Texas Street
Denton, TX 76209
Gabby.Leeper@cityofdenton.com
IP Address: 198.49.140.10

Record Tracking

Status: Original
11/17/2025 10:29:36 AM
Holder: Gabby Leeper
Gabby.Leeper@cityofdenton.com
Location: DocuSign

Signer Events	Signature	Timestamp
Gabby Leeper Gabby.Leeper@cityofdenton.com Senior Buyer City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign	**Completed** Using IP Address: 198.49.140.10	Sent: 11/17/2025 11:32:25 AM Viewed: 11/17/2025 11:32:59 AM Signed: 11/17/2025 11:33:50 AM
Lori Hewell lori.hewell@cityofdenton.com Purchasing Manager City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign	DS LH Signature Adoption: Pre-selected Style Using IP Address: 198.49.140.10	Sent: 11/17/2025 11:33:54 AM Viewed: 11/17/2025 2:03:12 PM Signed: 11/17/2025 2:03:48 PM
Marcella Lunn marcella.lunn@cityofdenton.com Senior Deputy City Attorney City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign	DocuSigned by: Marcella Lunn 4B070831B4AA438... Signature Adoption: Pre-selected Style Using IP Address: 198.49.140.10	Sent: 11/17/2025 2:03:50 PM Viewed: 11/18/2025 2:43:13 PM Signed: 11/18/2025 2:50:31 PM
Matt Tanner matttanner@tannerind.com Sales Administrator Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Accepted: 11/19/2025 7:37:21 AM ID: 912b92df-7e28-428e-9dcf-7857cf4950ed	Signed by: Matt Tanner C6B0C8E4CD1E4E9... Signature Adoption: Pre-selected Style Using IP Address: 50.251.34.217	Sent: 11/18/2025 2:50:35 PM Viewed: 11/19/2025 7:37:21 AM Signed: 11/19/2025 7:43:30 AM

Signer Events	Signature	Timestamp
Stephen D Gay Stephen.Gay@cityofdenton.com General Manager Water Utilities Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Accepted: 11/20/2025 2:30:14 PM ID: cd5a2e39-39f5-434d-82ea-375d769da6c8	Signed by: FEB48BB9726E4A9... Signature Adoption: Pre-selected Style Using IP Address: 198.49.140.10	Sent: 11/19/2025 7:43:33 AM Resent: 11/20/2025 2:27:04 PM Viewed: 11/20/2025 2:30:14 PM Signed: 11/20/2025 2:30:44 PM
Cheyenne Defee cheyenne.defee@cityofdenton.com Procurement Administration Supervisor City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign		Sent: 11/20/2025 2:30:47 PM
Sara Hensley sara.hensley@cityofdenton.com Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign		
Ingrid Rex ingrid.rex@cityofdenton.com Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign		

In Person Signer Events	Signature	Timestamp

Editor Delivery Events	Status	Timestamp

Agent Delivery Events	Status	Timestamp

Intermediary Delivery Events	Status	Timestamp

Certified Delivery Events	Status	Timestamp

Carbon Copy Events	Status	Timestamp
Cheyenne Defee cheyenne.defee@cityofdenton.com Procurement Administration Supervisor City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign	COPIED	Sent: 11/17/2025 11:33:53 AM
Gretna Jones gretna.jones@cityofdenton.com Legal Secretary City of Denton Security Level: Email, Account Authentication (None)	COPIED	Sent: 11/20/2025 2:30:47 PM Viewed: 11/21/2025 4:44:35 PM

Carbon Copy Events	Status	Timestamp
Electronic Record and Signature Disclosure: Not Offered via Docusign		
City Secretary Office citysecretary@cityofdenton.com Security Level: Email, Account Authentication (None)		
Electronic Record and Signature Disclosure: Not Offered via Docusign		
Trever Heskett Trever.heskett@cityofdenton.com Security Level: Email, Account Authentication (None)		
Electronic Record and Signature Disclosure: Accepted: 11/21/2025 2:53:16 PM ID: 7c3bf808-5a6f-4ad7-8147-b9d9f8002c43		

Witness Events	Signature	Timestamp

Notary Events	Signature	Timestamp

Envelope Summary Events	Status	Timestamps
Envelope Sent	Hashed/Encrypted	11/17/2025 11:32:25 AM

Payment Events	Status	Timestamps

Electronic Record and Signature Disclosure

ELECTRONIC RECORD AND SIGNATURE DISCLOSURE

From time to time, City of Denton (we, us or Company) may be required by law to provide to you certain written notices or disclosures. Described below are the terms and conditions for providing to you such notices and disclosures electronically through your DocuSign, Inc. (DocuSign) Express user account. Please read the information below carefully and thoroughly, and if you can access this information electronically to your satisfaction and agree to these terms and conditions, please confirm your agreement by clicking the 'I agree' button at the bottom of this document.

Getting paper copies

At any time, you may request from us a paper copy of any record provided or made available electronically to you by us. For such copies, as long as you are an authorized user of the DocuSign system you will have the ability to download and print any documents we send to you through your DocuSign user account for a limited period of time (usually 30 days) after such documents are first sent to you. After such time, if you wish for us to send you paper copies of any such documents from our office to you, you will be charged a $0.00 per-page fee. You may request delivery of such paper copies from us by following the procedure described below.

Withdrawing your consent

If you decide to receive notices and disclosures from us electronically, you may at any time change your mind and tell us that thereafter you want to receive required notices and disclosures only in paper format. How you must inform us of your decision to receive future notices and disclosure in paper format and withdraw your consent to receive notices and disclosures electronically is described below.

Consequences of changing your mind

If you elect to receive required notices and disclosures only in paper format, it will slow the speed at which we can complete certain steps in transactions with you and delivering services to you because we will need first to send the required notices or disclosures to you in paper format, and then wait until we receive back from you your acknowledgment of your receipt of such paper notices or disclosures. To indicate to us that you are changing your mind, you must withdraw your consent using the DocuSign 'Withdraw Consent' form on the signing page of your DocuSign account. This will indicate to us that you have withdrawn your consent to receive required notices and disclosures electronically from us and you will no longer be able to use your DocuSign Express user account to receive required notices and consents electronically from us or to sign electronically documents from us.

All notices and disclosures will be sent to you electronically

Unless you tell us otherwise in accordance with the procedures described herein, we will provide electronically to you through your DocuSign user account all required notices, disclosures, authorizations, acknowledgements, and other documents that are required to be provided or made available to you during the course of our relationship with you. To reduce the chance of you inadvertently not receiving any notice or disclosure, we prefer to provide all of the required notices and disclosures to you by the same method and to the same address that you have given us. Thus, you can receive all the disclosures and notices electronically or in paper format through the paper mail delivery system. If you do not agree with this process, please let us know as described below. Please also see the paragraph immediately above that describes the consequences of your electing not to receive delivery of the notices and disclosures electronically from us.

How to contact City of Denton:
You may contact us to let us know of your changes as to how we may contact you electronically, to request paper copies of certain information from us, and to withdraw your prior consent to receive notices and disclosures electronically as follows:
To contact us by email send messages to: purchasing@cityofdenton.com

To advise City of Denton of your new e-mail address
To let us know of a change in your e-mail address where we should send notices and disclosures electronically to you, you must send an email message to us at melissa.kraft@cityofdenton.com and in the body of such request you must state: your previous e-mail address, your new e-mail address. We do not require any other information from you to change your email address..
In addition, you must notify DocuSign, Inc to arrange for your new email address to be reflected in your DocuSign account by following the process for changing e-mail in DocuSign.

To request paper copies from City of Denton
To request delivery from us of paper copies of the notices and disclosures previously provided by us to you electronically, you must send us an e-mail to purchasing@cityofdenton.com and in the body of such request you must state your e-mail address, full name, US Postal address, and telephone number. We will bill you for any fees at that time, if any.

To withdraw your consent with City of Denton
To inform us that you no longer want to receive future notices and disclosures in electronic format you may:

i. decline to sign a document from within your DocuSign account, and on the subsequent page, select the check-box indicating you wish to withdraw your consent, or you may;
ii. send us an e-mail to purchasing@cityofdenton.com and in the body of such request you must state your e-mail, full name, IS Postal Address, telephone number, and account number. We do not need any other information from you to withdraw consent.. The consequences of your withdrawing consent for online documents will be that transactions may take a longer time to process..

Required hardware and software

Operating Systems:	Windows2000? or WindowsXP?
Browsers (for SENDERS):	Internet Explorer 6.0? or above
Browsers (for SIGNERS):	Internet Explorer 6.0?, Mozilla FireFox 1.0, NetScape 7.2 (or above)
Email:	Access to a valid email account
Screen Resolution:	800 x 600 minimum
Enabled Security Settings:	•Allow per session cookies •Users accessing the internet behind a Proxy Server must enable HTTP 1.1 settings via proxy connection

** These minimum requirements are subject to change. If these requirements change, we will provide you with an email message at the email address we have on file for you at that time providing you with the revised hardware and software requirements, at which time you will have the right to withdraw your consent.

Acknowledging your access and consent to receive materials electronically
To confirm to us that you can access this information electronically, which will be similar to other electronic notices and disclosures that we will provide to you, please verify that you were able to read this electronic disclosure and that you also were able to print on paper or electronically save this page for your future reference and access or that you were able to e-mail this disclosure and consent to an address where you will be able to print on paper or save it for your future reference and access. Further, if you consent to receiving notices and disclosures exclusively in electronic format on the terms and conditions described above, please let us know by clicking the 'I agree' button below.
By checking the 'I Agree' box, I confirm that:

- I can access and read this Electronic CONSENT TO ELECTRONIC RECEIPT OF ELECTRONIC RECORD AND SIGNATURE DISCLOSURES document; and

- I can print on paper the disclosure or save or send the disclosure to a place where I can print it, for future reference and access; and

- Until or unless I notify City of Denton as described above, I consent to receive from exclusively through electronic means all notices, disclosures, authorizations, acknowledgements, and other documents that are required to be provided or made available to me by City of Denton during the course of my relationship with you.

City of Denton

City Hall
215 E. McKinney Street
Denton, Texas
www.cityofdenton.com

AGENDA INFORMATION SHEET

DEPARTMENT: Procurement

ACM: Christine Taylor

DATE: December 15, 2025

SUBJECT

Consider recommending adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute a contract with Gage & Cade Construction, LLC, for the Home Chemicals and Recycling Center Improvements for the Solid Waste and Recycling Department; providing for the expenditure of funds therefor; and providing an effective date (CSP 8845 – awarded to Gage & Cade Construction, LLC, in the not-to-exceed amount of $614,738.00).

STRATEGIC ALIGNMENT

This action supports Key Focus Area: Enhance Infrastructure and Mobility.

INFORMATION/BACKGROUND

The Solid Waste Home Chemicals & Recycling Center (SWHCRC), constructed in 2007, has now been serving the community for 18 years. Operated by the Solid Waste and Recycling Department, the facility supports a wide range of programs and services, many of which are hosted directly at the SWHCRC. As the City of Denton and the surrounding areas continue to grow, the volume of traffic entering and exiting the center has increased significantly.

Improvements to the SWHCRC include.

- Concrete pavement improvements and expansions
- Grading of existing ground counters
- Industrial Ventilating Fans
- Grounding to eliminate static electricity
- Eye Wash and Emergency Shower Station
- Potable water extension
- Signage for improved wayfinding

Through the procurement process, Gage & Cade Construction, LLC was selected. The Home Chemicals and Recycling Center Improvements have a total estimated cost of $614,738. The estimate includes a $585,465 total base bid amount and a contingency of $29,273. A contingency allowance, if any, is for the sole use of the City and will be subject to written authorization by the City's Project Manager and Program Manager.

Competitive Sealed Proposals were sent to 1,328 prospective suppliers. In addition, specifications were placed on the Procurement website for prospective suppliers to download and advertised in the local newspaper. Seven (7) proposals were received, references were checked, and proposals were evaluated based upon published criteria, including key personnel, quality and reputation, and ability to complete similar projects, schedule and written plan, safety record, and price Based upon this evaluation, Gage & Cade Construction, LLC was ranked the highest and determined to be the best value for the City.

NIGP Code Used for Solicitation:	911, 912, 913, 914
Notifications sent for Solicitation sent in IonWave:	1,328
Number of Suppliers that viewed Solicitation in IonWave:	50
HUB-Historically Underutilized Business Invitations sent out:	154
SBE-Small Business Enterprise Invitations sent out:	422
Responses from Solicitation:	7

RECOMMENDATION

Award a contract with Gage & Cade Construction, LLC, for the Home Chemicals and Recycling Center Improvements for the Solid Waste and Recycling Department, in a not-to-exceed amount of $614,738.

PRINCIPAL PLACE OF BUSINESS

Gage & Cade Construction, LLC
Bertram, TX

ESTIMATED SCHEDULE OF PROJECT

Delivery of the items will occur within 270 days after receipt of order.

FISCAL INFORMATION

These services will be funded from Solid Waste & Recycling capital project account 660906595.1365.40100. Requisition #173310 has been entered into the Purchasing software system in the amount of $585,465. The budgeted amount for this item is $614,738.

EXHIBITS

Exhibit 1: Agenda Information Sheet
Exhibit 2: Pricing Evaluation
Exhibit 3: Ordinance and Contract

Respectfully submitted:
Lori Hewell, 940-349-7100
Purchasing Manager

For information concerning this acquisition, contact: Arturo Garcia, 940-349-8021.

Legal point of contact: Marcella Lunn at 940-349-8333.

Exhibit 2
CSP 8845 - Pricing Evaluation for Recycling Center Facility Improvements

Respondent's Business Name:	**Gage & Cade Construction, LLC**	Harendt Construction Group, LLC	CGC General Contractors, Inc.	Tegrity Contractors Inc.	Alman Construction Services	Fort Worth Civil Constructors	David-Tehoungue Ltd Co
Principal Place of Business (City and State):	**Bertram, TX**	Dennis, TX	Haltom City, TX	Allen, TX	Dallas, TX	Fort Worth, TX	Hickory Creek, TX
Total Proposal Amount	**$585,465.00**	$583,300.00	$593,315.84	$630,277.00	$680,586.00	$835,245.00	$1,071,000.00

Evaluation							
Scoring Criteria	**Gage & Cade Construction, LLC**	Harendt Construction Group, LL	CGC General Contractors, Inc.	Tegrity Contractors Inc.	Alman Construction Services	Fort Worth Civil Constructors,	David-Tehoungue Ltd Co
Offeror's Key Personnel - 10%	**8.67**	7.33	6.67	6.67	5.33	7.33	6.67
Quality, Reputation, and Ability to Complete Similar Projects on Schedule and Within Budget - 10%	**9.33**	6.67	6.00	6.67	3.33	4.67	6.00
Detailed Schedule and Written Plan - 25%	**16.67**	16.67	18.33	11.67	11.67	13.33	10.00
Offeror's Safety Record - 5%	**3.33**	3.00	3.00	3.00	2.67	2.67	1.67
Price, Total Cost of Ownership - 50%	**49.82**	50.00	49.16	46.27	42.85	34.92	27.23
Total Score:	**87.82**	83.67	83.16	74.27	65.85	62.92	51.56

ORDINANCE NO. _____

AN ORDINANCE OF THE CITY OF DENTON, A TEXAS HOME-RULE MUNICIPAL CORPORATION, AUTHORIZING THE CITY MANAGER TO EXECUTE A CONTRACT WITH GAGE & CADE CONSTRUCTION, LLC, FOR THE HOME CHEMICALS AND RECYCLING CENTER IMPROVEMENTS FOR THE SOLID WASTE AND RECYCLING DEPARTMENT; PROVIDING FOR THE EXPENDITURE OF FUNDS THEREFOR; AND PROVIDING AN EFFECTIVE DATE (CSP 8845 – AWARDED TO GAGE & CADE CONSTRUCTION, LLC, IN THE NOT-TO-EXCEED AMOUNT OF $614,738.00).

WHEREAS, the City has solicited, received, and evaluated competitive proposals for the Home Chemicals and Recycling Center Improvements for the Solid Waste and Recycling Department; and

WHEREAS, the City Manager, or a designated employee, has received, reviewed, and recommended that the herein described proposals are the most advantageous to the City considering the relative importance of price and the other evaluation factors included in the competitive sealed proposals; and

WHEREAS, this procurement was undertaken as part of the City's governmental function [Building codes and inspection]; and

WHEREAS, the City Council has provided in the City Budget for the appropriation of funds to be used for the purchase of the materials, equipment, supplies, or services approved and accepted herein; NOW, THEREFORE,

THE COUNCIL OF THE CITY OF DENTON HEREBY ORDAINS:

SECTION 1. The items in the following numbered competitive sealed proposal for materials, equipment, supplies, or services shown in the "Competitive Sealed Proposals" on file in the office of the Purchasing Agent, are hereby accepted and approved as being the most advantageous to the City considering the relative importance of price and the other evaluation factors included in the competitive sealed proposal.

CSP NUMBER	CONTRACTOR	AMOUNT
8845	Gage & Cade Construction, LLC	$614,738.00

SECTION 2. That by the acceptance and approval of the above numbered items of the submitted proposals, the City accepts the offer of the persons submitting the proposals for such items and agrees to purchase the materials, equipment, supplies, or services in accordance with the terms, specifications, standards, quantities, and for the specified sums contained in the Proposal Invitations, Proposals, and related documents.

SECTION 3. That should the City and person submitting approved and accepted items wish to enter into a formal written agreement as a result of the acceptance, approval, and awarding of the proposals, the City Manager, or their designated representative, is hereby authorized to execute the written contract which shall be attached hereto; provided that the written contract is in accordance with the terms, conditions, specifications, standards, quantities, and specified sums contained in the Proposal and related documents herein approved and accepted.

SECTION 4. The City Council of the City of Denton hereby expressly delegates the authority to take any actions that may be required or permitted to be performed by the City of Denton under this ordinance to the City Manager of the City of Denton, or their designee.

SECTION 5. By the acceptance and approval of the above enumerated bids, the City Council hereby authorizes the expenditure of funds therefor in the amount and in accordance with the approved bids.

SECTION 6. This ordinance shall become effective immediately upon its passage and approval.

The motion to approve this ordinance was made by _____ and seconded by _____. This ordinance was passed and approved by the following vote [___ - ___]:

	Aye	**Nay**	**Abstain**	**Absent**
Mayor Gerard Hudspeth:	_____	_____	_____	_____
Vicki Byrd, District 1:	_____	_____	_____	_____
Brian Beck, District 2:	_____	_____	_____	_____
Suzi Rumohr, District 3:	_____	_____	_____	_____
Joe Holland, District 4:	_____	_____	_____	_____
Brandon Chase McGee, At Large Place 5:	_____	_____	_____	_____
Jill Jester, At Large Place 6:	_____	_____	_____	_____

PASSED AND APPROVED this the _____ day of _____, 2025.

_____
GERARD HUDSPETH, MAYOR

ATTEST:
INGRID REX, CITY SECRETARY

BY: _____

APPROVED AS TO LEGAL FORM:
MACK REINWAND, CITY ATTORNEY

BY: Leah Bush

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Docusign City Council Transmittal Coversheet

FILE	8845
File Name	RECYCLING CENTER FACILITY IMPROVEMENTS
Purchasing Contact	Crystal Westbrook
City Council Target Date	
Piggy Back Option	Not Applicable
Contract Expiration	
Ordinance	

DS
LH

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STIPULATED SUM VERTICAL CONSTRUCTION CONTRACT

BY AND BETWEEN

CITY OF DENTON

AND

GAGE & CADE CONSTRUCTION, LLC

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EXHIBIT B DRAWINGS AND SPECIFICATIONS; ON FILE WITH THE PURCHASING AGENT
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STIPULATED SUM VERTICAL CONSTRUCTION CONTRACT

This Stipulated Sum Vertical Construction Contract (this "Agreement") made as of the ____ day of _____ in the year 20____ (the "Effective Date") between City of Denton, a Texas home rule municipal corporation located at 215 East McKinney Street Denton, Texas 76201 (the "Owner" or "City") and Gage & Cade Construction, LLC at 1107 County Road 264, Bertram, TX 78605 (the "Contractor") for the following Project:

CSP #8845 RECYCLING CENTER FACILITY IMPROVEMENTS

The Owner and Contractor agree as follows:

Article 1. THE CONTRACT DOCUMENTS

Section 1.1 The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in the above table of contents, documents issued as part of the solicitation for the Project, this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9. In the event any provision contained in this Agreement conflicts with any provision contained in the Contract Documents, the more stringent provision for the Contractor, as interpreted by the Owner, shall govern.

Section 1.2 If, and to the extent of, any inconsistency, ambiguity, discrepancy or error in the Contract Documents (referred to collectively in this Section 1.2 as discrepancy), the Contractor shall immediately seek clarification from Biggs & Mathews Environmental, Inc. (the "Design Professional" or "Architect" or "Engineer" as reference may be made in the Contract Documents) and notify the Owner and Contractor that clarification has been requested. In the event that the Design Professional fails to clarify such discrepancy, within a reasonable time under the circumstances, the Contractor shall proceed with the Work without the clarification based on written permission from the Owner, and give precedence to the Contract Documents in the following descending order of priority:

a. Modifications issued after execution of the Owner-Contractor Agreement, including all exhibits not specifically referenced in this Section 1.2;
b. the Owner-Contractor Agreement;

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c. Addenda issued prior to the execution of the Owner-Contractor Agreement, with the Addenda bearing the latest date taking precedence;
d. the General Conditions of the Contract for Construction;
e. Exhibit “B” - Drawings and Specifications;

Article 2. THE WORK OF THIS CONTRACT

Section 2.1 The Contractor shall in a good workmanlike manner, fully execute the Work described in, and reasonably inferable by the Contractor as necessary to provide the results intended by fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others: and the Contractor at its sole cost, risk, and expense shall construct, equip, provide purchase, pay for, and furnish all of the Work in accordance with such Contract Documents. and governmental codes and regulations as they apply to performance of the Work.

Section 2.2 An Index of Drawings and Specifications which have been furnished to the Contractor as of the date of this Agreement is set forth in Exhibit “B” – Drawings and Specifications.

Section 2.3 The Contractor shall not be entitled to any adjustments in the Contract Sum or the Contract Time as a result of any action, or failure to act, in connection with any work or other services performed by the Contractor, or any entity affiliated with the Contractor, for portions of the Project other than the Work, such as, without limitation, other projects for this Owner or nearby the Project site, whether such work or other services are performed under contract with the Owner or an independent third party.

Section 2.4 The Contractor shall proceed with performance of the Work as required by the Contract Documents and shall not modify such requirements unless such modifications are accepted by the Owner in a Change Order or Construction Change Directive. The Contractor shall not be entitled to receive any additional fees as a result of any modification requests or recommendations submitted by the Contractor.

Section 2.5 The Contractor shall furnish only skilled and properly trained staff for the performance of the Work. The key members of the Contractor's staff shall be persons agreed upon with the Owner and Contractor and identified in Exhibit "C" – Key Personnel, which is attached hereto and incorporated herein for all purposes.

a. Such key members of the Contractor's staff shall not be changed without the written consent of the Owner and Contractor, unless such person becomes unable to perform any required duties due to death, disability or termination of employment with the

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Contractor. If a key member is no longer capable of performing in the capacity described in Exhibit "C" – Key Personnel, the Owner, Design Professional, and the Contractor shall agree on a mutually acceptable substitute.

b. During the performance of the Work, the Contractor shall keep a competent superintendent at the Project site, who is fully authorized to act on behalf of the Contractor. Notice from the Owner, Contractor or the Design Professional to such superintendent, in connection with defective Work, instructions for performance of the Work or any and all other issues shall be considered notice of such issues to the Contractor.

Article 3. DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

Section 3.1 The construction of the Work to be performed under this Contract shall be commenced within three (3) calendar days after receipt of a building permit and Owner's Notice to Proceed.

Issuance of a Notice to Proceed for construction of the Work is subject to Owners acceptance of the Contractor's proposed Construction Management Plan, and receipt of a building permit.

The Contractor shall notify the Owner in writing, with confirmation of receipt, not less than three (3) business days before commencing the Work on the Project site to permit timely filing of mortgages, mechanics' liens, and other security interests.

Section 3.2 The Contract Time shall be measured from the date of Notice to Proceed.

Section 3.3 Substantial Completion

a. Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall diligently prosecute the Work and shall achieve Substantial Completion of the entire Work by 270 days.
b. If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, shall be as specified in Section 8.6 of Exhibit A - General Conditions for the Contract for Construction.

Section 3.4 Final Completion

a. Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall diligently prosecute the Work and shall achieve final completion of the entire Work by 300 days.

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b. If the Contractor fails to achieve final completion as provided in this Section 3.3, liquidated damages, shall be as specified in Section 8.6 of Exhibit A - General Conditions for the Contract for Construction.

Article 4. CONTRACT SUM

Section 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be five hundred eighty-five thousand four hundred sixty-five Dollars ($585,465.00), subject to additions and deductions as provided in the Contract Documents. At the sole option of the City, five (5) percent contingency in the amount of twenty-nine thousand two hundred seventy-three Dollars ($29,273.00) may be used for a total not-to-exceed amount of six hundred fourteen thousand seven hundred thirty-eight Dollars ($614,738.00).

Section 4.2 Alternates

a. Alternates, if any, included in the Contract Sum:

   See Exhibit "D" – Alternates-none

b. Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Provided, however, that the Contractor shall furnish the Owner with no less than fourteen (14) days prior written notice of the date upon which any of the alternatives set forth in Exhibit "D" – Alternates, must be accepted by the Owner in order for the Contractor to perform the Work covered by such alternates for the price(s) set forth therein; and without any adjustment to a Contractual Milestone date, the Contractor's Construction Schedule or the Contract Time. Upon acceptance, the Owner shall issue a Modification to this Agreement.

   See Exhibit "D" – Alternates-none

Section 4.3 Allowances, if any, included in the Contract Sum:

See Exhibit "E" – Allowances-none

Section 4.4 Unit prices, if any are set forth in Exhibit "F" – Unit Costs, and such unit prices are considered complete and include all materials, equipment, labor, delivery, installation, overhead, and profit; and any other costs or expenses in connection with, or incidental to, the performance of that portion of the Work to which such unit prices apply.

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See Exhibit “F” – Unit Costs

Section 4.5 Liquidated damages, if any:
See Exhibit A - General Conditions for the Contract for Construction

Section 4.6 Other:

Section 4.7 By executing this Agreement and furnishing the Owner with both Exhibit “E” – Allowances and Exhibit “G” – Initial Schedule of Values, the Contractor represents and warrants that the Contract Documents, materials, and information furnished by the Contractor as of the date of this Agreement, and the ongoing discussions and meetings between the Contractor and the Owner and Design Professional have described the scope, construction requirements and design intent for the Work in detail sufficient to enable the Contractor to firmly establish the Contract Sum and the Contract Time. The Contractor shall not be permitted to claim any adjustment in either the Contract Sum or Contract Time prior to Notice to Proceed in connections with the completion of the Work except as described in the Contract Documents.

Article 5. PAYMENTS

Section 5.1 Progress Payments

a. Based upon Applications for Payment including all supporting documentation required by the Owner and submitted to the Design Professional and Owner by the Contractor; its review by the Design Professional and Owner; and Certificates for Payment issued by the Design Professional and Certificates for Payment issued by the Design Professional, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.
b. The period covered by each Application for Payment shall be one calendar month ending on the last day of the month.
c. Provided that a certifiable Application for Payment is approved by the Design Professional not later than the «twenty-fifth (25th) » day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the « thirtieth (30th) » day of the « following » month. If a certifiable Application for Payment is received by the Design Professional after the application date fixed above, payment of the amount certified shall be made by the Owner not later than « thirty » (« 30 ») calendar days after the Design Professional approves the Application for Payment.
d. Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor and approved in advance by the Owner and Design Professional in accordance with the Contract Documents and the Construction Management Plan. The schedule of values shall allocate the entire Contract Sum among

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the various portions of the Work and be prepared in such form, and supported by such data to substantiate its accuracy, as the Owner and Design Professional may require. This schedule of values, unless objected to by the Owner or Design Professional, shall be used as a basis for reviewing the Contractor's Applications for Payment.

e. Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

f. In accordance with Exhibit A - General Conditions for the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

   i. The amount of each progress payment shall first include:

      .1 That portion of the Contract Sum properly allocable to completed Work;

      .2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and

      .3 That portion of Construction Change Directives that the Design Professional determines, in the Design Professional's professional judgment, to be reasonably justified.

   ii. The amount of each progress payment shall then be reduced by:

      .1 The aggregate of any amounts previously paid by the Owner;

      .2 The amount, if any, for Work that remains uncorrected and for which the Contractor or Design Professional has previously withheld or nullified a Certificate for Payment as provided in Article 9 of Exhibit A - General Conditions for the Contract for Construction;

      .3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;

      .4 For Work performed or defects discovered since the last payment application, any amount for which the Design Professional may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of Exhibit A - General Conditions for the Contract for Construction; and

      .5 Retainage withheld pursuant to Section 5.1.g.

      .6

g. Retainage

   i. For each progress payment made prior to Final Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:

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« Five Percent (5.0%) »

h. Omitted.

i. Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

j. Each Application for Payment shall, without limitation, conform with the requirements of Exhibit A - General Conditions for the Contract for Construction, as amended.

k. In taking action on the Contractor's Applications for Payment, the Owner and Design Professional shall be entitled to rely on the accuracy and completeness of the information furnished by the Contractor and shall not be deemed to represent that the Owner or Design Professional have made a detailed examination, audit or arithmetic verification of the documentation submitted in accordance with this Section 5.1.k or other supporting data; that the Owner or Design Professional have made exhaustive or continuous on-site inspections; or that the Owner or Design Professional have made examinations to ascertain how or for what purposes the Contractor has used amounts previously paid on account of the Contract. Such examinations, audits and verifications, if required by the Owner, will be performed by the Owner's auditors acting in the sole interest of the Owner.

l. Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site, and even with such approval the Contractor shall follow the procedures in the Contract Documents for such payments.

m. In addition to other required items, the final Application for Payment shall be accompanied by the following, all in form and substance satisfactory to the Owner and in compliance with applicable statutes of the State of Texas all in a form acceptable to the Owner:

.1 A current sworn statement from the Contractor setting forth all Subcontractors and any material suppliers with whom the Contract has entered into subcontracts; the amount of each such subcontract; the amount requested for any Subcontractor or material supplier in the Application for Payment; and the amount to be paid to the Contractor from such final payment;

.2 A current, duly executed waiver of mechanics' and material suppliers' liens from the Contractor conditional upon establishing receipt of payment or satisfaction of the payment requested by the Contractor in the current Application for Payment;

.3 A current Subcontractor's lien waiver for the current period, conditional only on payment from the Contractor, and duly executed, acknowledged sworn statement showing all Sub-subcontractors and material suppliers with whom the

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Subcontractor has entered into sub-subcontracts, the amount of each such sub-subcontract, the amount requested for any Sub-subcontractor and material supplier in the requested progress payment, and the amount to be paid to the Sub-subcontractor from such final payment to the Subcontractor;

.4 A current, duly executed unconditional final waiver of mechanics' and material suppliers' liens from the Contractor and all Subcontractors and, when deemed appropriate by the Owner and Design Professional, from material suppliers and Sub-subcontractors establishing payment or satisfaction of payments of all amounts requested by the Contractor on behalf of such entities or persons in any previous Applications for Payment;

.5 A final certificate of occupancy issued by the appropriate governmental body in which the project is located;

.6 All maintenance and operating manuals;

.7 Digitally marked, fully accessible electronic files (not "plot files" or "PDFs") of both field record drawings and specifications reflecting "as-built" conditions;

.8 Digitally marked, accurately dimensioned, and fully accessible electronic files (not "plot files" or "PDFs") of drawings reflecting the location of any concealed utilities, mechanical or electrical systems, and components;

.9 any special guarantees or warranties required by the Contract Documents;

.10 assignments of all guarantees and warranties from subcontractors, vendors, suppliers, or manufacturers;

.11 a list of the primary contact names, email addresses, physical addresses, and telephone numbers of all Subcontractors and any other persons providing guarantees and warranties;

.12 all information and materials required to comply with the requirements of the Contract Documents or reasonably requested by the Owner, or the Design Professional; and

.13 If required by the Owner's title insurer, if any, the Contractor shall execute a personal gap undertaking in form and substance satisfactory to such title insurer.

Section 5.2 Final Payment

a. Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

.1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of Exhibit A - General Conditions for the Contract for Construction, and to satisfy other requirements, if any, which necessarily survive beyond final payment; and

.2 a final Certificate for Payment has been issued by the Design Professional; and.

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.3 the Contractor has provided, and the Owner has accepted as correct, all the information and documents required under Section 5.1.m above; and

.4 a complete release of all claims arising out of, related to or connected with Contractor's performance of the respective Phase under this Agreement, and any claims of Subcontractors, subject to any claims reserved in accordance with the terms of the General Conditions and an affidavit that so far as Contractor has knowledge or information, the release includes and covers all materials and services over which Contractor has control for which a claim could be filed, subject to any claims reserved in accordance with the terms of the General Conditions.

b. The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the Design Professional's final Certificate for Payment and the Contractor has provided Owner with all required documentation.

Section 5.3 Interest

Payments are due and payable within thirty (30) days of the date the Owner receives the Construction Manager's approvable invoice, unless a different date for payment is provided under this Agreement. Amounts unpaid shall bear interest at the legal rate allowed by Texas Government Code Ch. 2251.

Article 6. DISPUTE RESOLUTION

Section 6.1 Initial Decision Maker

The Owner will serve as the Initial Decision Maker pursuant to Article 15 of Exhibit A - General Conditions for the Contract for Construction.

Section 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation or other alternative dispute resolution method as mutually agreed by the parties ("ADR") pursuant to Article 15 of Exhibit A - General Conditions for the Contract for Construction, the method of binding dispute resolution shall be litigation in a court of competent jurisdiction.

Article 7. TERMINATION OR SUSPENSION

Section 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of Exhibit A - General Conditions for the Contract for Construction, as amended.

If the Contract is terminated for the Owner's convenience in accordance with Article 14 of Exhibit A - General Conditions for the Contract for Construction, then the Owner shall pay the

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Contractor a compensation calculated in the manner as specified in Section 14.4.c of Exhibit A - General Conditions for the Contract for Construction, as amended.

Section 7.2 The Work may be suspended by the Owner as provided in Article 14 of Exhibit A - General Conditions for the Contract for Construction, as amended.

Section 7.3 In the event of such termination by the Owner, the amount to be paid to the Contractor shall not exceed the amount the Contractor would have been entitled to receive under Article 5 above.

Section 7.4 In no event shall the Contractor be entitled to receive "Lost Opportunity Costs", defined as unabsorbed overhead costs or unrealized profit on this Work, future work for this Owner, other owner(s), other work, foregone opportunities for the Contractor, or other costs not directly and verifiably associated with services actually performed or Work successfully completed under this Agreement.

Article 8. MISCELLANEOUS PROVISIONS

Section 8.1 All references in this Agreement to Exhibit A, shall mean the Exhibit A - General Conditions for the Contract for Construction, as modified and amended by the parties hereto. Where reference is made in this Agreement to a provision of another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

Section 8.2 The Owner's representative:

City of Denton
Arturo Garcia
Project Manager
901B Texas Street
Denton, Texas 76209
(940) 349-8021
arturo.garcia@cityofdenton.com

Section 8.3 The Contractor's representative:
Gage & Cade Construction, LLC
Jason Reeves
1107 County Road 264
Bertram, TX 8605
(512)379-8176
jason@gageandcadeconstruction.com

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Section 8.4 Neither the Owner's nor the Contractor's representative shall be changed without ten days' prior notice to the other party.

Section 8.5 Insurance and Bonds

a. The Owner and the Contractor shall purchase and maintain insurance as set forth in Exhibit A - General Conditions for the Contract for Construction, Insurance and Bonds, and elsewhere in the Contract Documents.

Section 8.6 « Not Used. »

Section 8.7 Other Conditions and Services:

a. The Contractor represents and warrants the following to the Owner (in addition to any other representation and warranties contained in the Contract Documents) as a material inducement to the Owner to execute this Agreement, which representations and warranties shall survive the execution and delivery of this Agreement, any termination of this Agreement, and final completion of the Work:

.1 The Contractor is financially solvent, capable of obtaining adequate insurance, able to pay all debts as they mature and possessed of sufficient working capital to complete the Work and perform all obligations hereunder;

.2 The Contractor is able to furnish the physical infrastructure, tools, materials, supplies, equipment and supervision, and labor required to complete the Work and perform its obligations hereunder and has sufficient experience and competence to do so;

.3 The Contractor is authorized to do business in the City of Denton, and the State of Texas and is properly licensed by all necessary governmental and public and quasi-public authorities having jurisdiction over the Contractor and over the Work and the Project;

.4 The Contractor's execution of this Agreement and performance thereof is within the Contractor's duly-authorized powers;

.5 The Contractor's duly-authorized representative has visited the site of the Project and is familiar with the local conditions under which the Work is to be performed and has correlated its observations with the requirements of the Contract Documents;

.6 The Contractor possesses a high level of experience and expertise in the business administration, construction, construction management and superintendence of projects of this size, complexity and nature of this particular Project and will perform the Work with the care, skill and diligence of such a contractor;

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.7 The foregoing warranties are in addition to, and not in lieu of, any and all other liability imposed upon the Contactor by law with respect to the Contractor's duties, obligations, and performance hereunder; and

.8 The Contractor acknowledges that the Owner is relying upon the Contractor's skill and experience in connection with the proper, timely and diligent prosecution of the Work.

b. In the event any provision contained in this Agreement conflicts with any provision contained in the Contract Documents, the more stringent provision for the Contractor, as interpreted by the Owner, shall govern.

c. Some or all of the Owner's duties, approvals and actions required under this Agreement may be provided by third parties by mutual agreement of the Owner and such third parties. When notified in writing of the specific duties and responsibilities of such third party, the Contractor will recognize the actions and approvals of the third party as sufficient to fulfill the Owner's responsibilities under this Agreement.

d. The Contractor shall provide sufficient supporting documentation in form and with a level of detail wholly acceptable to the Owner and Contractor to substantiate any Application for Payment, request for Change to the Contract Sum or Contract Time, and all contract Allowances provided within the Contractor's Contract Sum for this scope of work. Failure to timely provide all supporting documentation, in and of itself, may result in rejection of the Application for Payment or requested change to the Contract Sum or Contract Time, or payment for work charged to the Allowance(s).

e. Proof of purchase and warehouse insurance naming the Owner, Contractor and Design Professional as additional insureds, together with inspection rights for the Owner, Contractor and Design Professional is to be provided for any billed materials by the Contractor for the work not physically stored at the Project site.

f. Time limits set out in or under this Agreement are solely for the protection and benefit of the Owner and create no third-party beneficiary rights in any other party.

g. Notices. All legal notices, consents, approvals, demands, requests or other communications provided for or permitted to be given under any of the provisions of this Agreement shall be in writing and shall be deemed to have been duly given or served when delivered by hand delivery or when deposited in the U.S. mail by registered or certified mail, return receipt requested, postage prepaid, and addressed as follows:

If to Owner:
Arturo Garcia
Project Manager
City of Denton
901B Texas Street
Denton, Texas 76201
arturo.garcia@cityofdenton.com

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City of Denton
ATTN: Contract 8845; Purchasing Manager
901B Texas Street
Denton, Texas 76209
purchasing@cityofdenton.com

And with a copy to City Attorney's point of contact:

City Attorney
City of Denton
215 East McKinney St.
Denton, TX 76201
legal@cityofdenton.com

If to Contractor:
Gage & Cade Construction, LLC
Jason Reeves
1107 County Road 264
Bertram, TX 8605
(512)379-8176
jason@gageandcadeconstruction.com

If to Design Professional:
Biggs & Mathews Environmental, Inc.
Gregory Adams
1700 Robert Road, STE 100
Mansfield, TX 76063
(817)563-1144
gadams@biggsandmathews.com

h. All Exhibits referred to in this Agreement are, by reference, incorporated herein for all purposes.
i. The numbering and captions of the sections are set forth only for convenience and reference and are not intended in any way to define, limit, or describe the scope or intent of this Agreement.
j. The parties agree that they will execute any further instrument or instruments, and that they will perform any act or acts, which are or may become necessary to effectuate any of the terms or provisions of this Agreement.

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k. Nothing contained in this Agreement shall create a contractual relationship with a cause of action in favor of a third party against either the Owner or Contractor.
l. This Agreement has been created jointly and ambiguity cannot be construed against either party.
m. This Agreement is and shall be subject to those provisions required of political subdivisions by the laws of the State of Texas. The Contractor understands that the Owner is a Texas home rule municipality and that the project is subject to applicable provisions of Texas law including bid requirements, bonding, and final settlement provisions.
n. Contractor understands that certain information, including this Agreement, are public records available for public inspection and copying under the Texas Open Records Act., Texas Government Code Ch. 552, as amended, and other applicable laws.
o. The Owner represents that there are sufficient funds available to undertake this Project.
p. No term or condition of the Agreement shall be construed or interpreted as a waiver, express or implied, of any of the governmental or sovereign immunities, rights, benefits, or protections of the Owner.
q. Contractor warrants that the products, processes, techniques and methodologies provided by Contractor shall not infringe upon the copyright, patent or other proprietary rights of others.
r. Contractor certifies and warrants that no gratuities, kickbacks or contingency fees were paid in connection with this Agreement, nor were any fees, commissions, gifts or other considerations made contingent upon the award of this Agreement. Contractor warrants that to the best of Contractor's knowledge, there exists no actual or potential conflict of interest, and no financial or substantial interest as may be prohibited by Texas law, the Charter, or Code of Ethics of the City of Denton between Contractor and Owner.
s. Contractor shall comply with the disclosure and reporting requirements in Local Government Code Chapters 171 and 176, and Texas Government Code Sec. 2252.908. Under Sec. 2252.908, if City Council approval is required to award this Agreement or if this Agreement has a value of at least $1,000,000, the City may not enter into the Agreement unless the Contractor submits a disclosure of interested parties to the City at the time the executed Agreement is presented to the City. The disclosure must be made on the form prescribed by the Texas Ethics Commission and the City is required to submit a copy of the disclosure statement to the Texas Ethics Commission not later than the 30th day after the disclosure is received by the City.
t. In case any provision hereof shall, for any reason, be held invalid or unenforceable in any respect, such invalidity or unenforceability shall not affect any other provision hereof, and this Contract shall be construed as if such invalid or unenforceable provision had not been included herein.
u. Contractor understands and agrees that TIME IS OF THE ESSENCE.

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v. This Agreement may be executed by the parties hereto in separate counterparts, each of which when so executed and delivered shall be an original, but all such counterparts shall together constitute one and the same instrument. Each counterpart may consist of any number of copies hereof each signed by less than all, but together signed by all of the parties hereto. Any documents submitted to the City in electronic format shall be considered equivalent to an original of such document.

w. Any of the representations, warranties, covenants, and obligations of the Parties, as well as any rights and benefits of the Parties, pertaining to a period of time following the termination of this Agreement shall survive termination.

x. COMPLIANCE WITH CERTAIN STATE LAW

.1 Prohibition on Contracts with Companies Boycotting Israel. Contractor acknowledges that in accordance with Chapter 2271 of the Texas Government Code, City is prohibited from entering into a contract with a company for goods or services unless the contract contains a written verification from the company that it: (1) does not boycott Israel; and (2) will not boycott Israel during the term of the contract. The terms "boycott Israel" and "company" shall have the meanings ascribed to those terms in Section 808.001 of the Texas Government Code. By signing this agreement, Contractor certifies that Contractor's signature provides written verification to the City that Contractor: (1) does not boycott Israel; and (2) will not boycott Israel during the term of the agreement. Failure to meet or maintain the requirements under this provision will be considered a material breach.

.2 Prohibition on Contracts with Companies Boycotting Certain Energy Companies. Contractor acknowledges that in accordance with Chapter 2274 of the Texas Government Code, City is prohibited from entering into a contract with a company for goods or services unless the contract contains written verification from the company that it (1) does not boycott energy companies; and (2) will not boycott energy companies during the term of the contract. The terms "boycott energy company" and "company" shall have the meanings ascribed to those terms in Section 809.001 of the Texas Government Code. By signing this agreement, Contractor certifies that Contractor's signature provides written verification to the City that Contractor: (1) does not boycott energy companies; and (2) will not boycott energy companies during the term of the agreement. Failure to meet or maintain the requirements under this provision will be considered a material breach.

.3 Prohibition on Contracts with Companies Boycotting Certain Firearm Entities and Firearm Trade Associations. Contractor acknowledges that in accordance with Chapter 2274 of the Texas Government Code, City is prohibited from entering into a contract with a company for goods or services unless the contract contains written verification from the company that it (1) does not have a

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practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association; and (2) will not discriminate during the term of the contract against a firearm entity or firearm trade association. The terms "discriminate against a firearm entity or firearm trade association," "firearm entity" and "firearm trade association" shall have the meanings ascribed to those terms in Chapter 2274 of the Texas Government Code. By signing this agreement, Contractor certifies that Contractor's signature provides written verification to the City that Contractor: (1) does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association; and (2) will not discriminate during the term of the contract against a firearm entity or firearm trade association. Failure to meet or maintain the requirements under this provision will be considered a material breach.

.4 Prohibition on Contracts with Companies Doing Business with Iran, Sudan, or a Foreign Terrorist Organization. Sections 2252 and 2270 of the Texas Government Code restricts CITY from contracting with companies that do business with Iran, Sudan, or a foreign terrorist organization. By signing this agreement, Contractor certifies that Contractor's signature provides written verification to the City that Contractor, pursuant to Chapters 2252 and 2270, is not ineligible to enter into this agreement and will not become ineligible to receive payments under this agreement by doing business with Iran, Sudan, or a foreign terrorist organization. Failure to meet or maintain the requirements under this provision will be considered a material breach.

.5 Termination Right for Contracts with Companies Doing Business with Certain Foreign-Owned Companies. The City of Denton may terminate this Contract immediately without any further liability if the City of Denton determines, in its sole judgment, that this Contract meets the requirements under Chapter 2274, and Contractor is, or will be in the future, (i) owned by or the majority of stock or other ownership interest of the company is held or controlled by individuals who are citizens of China, Iran, North Korea, Russia, or other designated country (ii) directly controlled by the Government of China, Iran, North Korea, Russia, or other designated country, or (iii) is headquartered in China, Iran, North Korea, Russia, or other designated country.

.6 Pursuant to Chapter 2258, Texas Government Code, all contractors and any Subcontractor involved in the construction of a public work project shall pay not less than the prevailing rates as per diem wages in the locality at the time of construction to all laborers, workmen and mechanics employed by them in the execution of this contract. Contractor shall assure that these requirements are met for the Project and shall insure that every contract or subcontract relating to the Work requires, on behalf of Owner, that the prevailing wage rates be paid.

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.7 The Contractor shall be provided an applicable Department of Labor Wage Rate Determination for use on the Project required by Chapter 2258.022, Texas Government Code. In the event the Owner does not provide this Labor Wage Rate Determination, the Contractor shall request it in writing in a timely manner, so as not to delay the Construction Manager's initial subcontractor procurement process during preconstruction. The Construction Manager shall, if requested by the Owner, assist the Owner in conducting a survey of the wages paid, by labor class, on projects of a similar type in a similar location.

Article 9. ENUMERATION OF CONTRACT DOCUMENTS

Section 9.1 This Agreement is comprised of the following documents:

.1 Stipulated Sum Vertical Construction Contract

.2 Exhibit "A" – General Conditions of the Contract for Construction

.3 Exhibit "B" – Drawings and Specifications (On File with Purchasing Manager)

.4 Addenda, if any:

See Exhibit "B" – Drawings and Specifications (On File with Purchasing Manager)

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

.5 Other Exhibits:

Exhibit "C" – Key Personnel
Exhibit "D" – Alternates -none
Exhibit "E" – Allowances -none
Exhibit "F" – Unit Costs
Exhibit "G" – Initial Schedule of Values-none
Exhibit "H" – Contractor's Construction Schedule
Exhibit "I" – Escrow Agreement-none
Exhibit "J" – Conflict of Interest Questionnaire
Exhibit "K" – Proposal Form
Exhibit "L" – Prevailing Wage Rates
Exhibit "Y" – Contractor's Insurance Certificate(s) and Bonds (To be Completed after Contract Award)

.6 Other documents, if any, listed below:

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« »

This Agreement entered into as of the day and year first written above.

CONTRACTOR:
GAGE & CADE CONTRUCTION, LLC

BY: DocuSigned by: Jason Reeves A619B99E2C2448D...

JASON REEVES
TITLE Senior Vice President

CITY:
CITY OF DENTON, TEXAS

BY: _____

SARA HENSLEY
CITY MANAGER

THIS AGREEMENT HAS BEEN

BOTH REVIEWED AND APPROVED

as to financial and operational obligations and business terms.

Signed by: Brenda Haney C3C63BE563154A1... Brenda Haney

SIGNATURE PRINTED NAME

Director

TITLE

Director

DEPARTMENT

ATTEST:

INGRID REX, CITY SECRETARY

BY: _____

APPROVED AS TO LEGAL FORM:

MACK REINWAND, CITY ATTORNEY

BY: Signed by: Leah Bush 2A936B08B5D7485...

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Section 00 72 00
Exhibit A – General Conditions
for the following PROJECT:
Recycling Center Facility Improvements

THE OWNER:

City of Denton
215 East McKinney Street
Denton, Texas 76201

THE DESIGN PROFESSIONAL:

Biggs & Mathews Environmental, Inc.
1700 Robert Road, Suite 100
Mansfield, Texas 76063

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Article 1. GENERAL PROVISIONS

Section 1.1 Basic Definitions

a. The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Proposal Documents, Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Design Professional. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

b. The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Design Professional or the Design Professional's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Design Professional or the Design Professional's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Design Professional shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Design Professional's duties. This Agreement was the result of negotiations between the Owner and Contractor, and has been reviewed by the Owner, Contractor and their respective counsel. Accordingly, this Agreement shall be deemed to be the product of both parties and no ambiguity shall be construed in favor of or against either party. The terms "Agreement" and "Contract" shall be used interchangeably to have the same meaning as defined in this Section 1.1.b.

c. The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, supplies, skill, supervision, transportation, support services, facilities and other resources necessary or proper or incidental to the carrying out and completion of the terms of the contract and all other items of cost or value needed to produce, construct and fully complete the Work identified by the Contract Documents. The Work may constitute the whole or a part of the Project.

d. The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

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e. The Drawings
The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

f. The Specifications
The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

g. Design Documents
Design Documents are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Design Professional and the Design Professional's consultants under their respective professional services agreements. Design Documents may include, without limitation, studies, surveys, models, sketches, drawings, specifications, the Project Manual and other similar materials.

h. Initial Decision Maker
The Initial Decision Maker is the person identified in the Agreement to render initial decisions.

i. The Indemnitees
The Owner, which includes the Mayor, members of the City Council, employees, agents, assigns, and other city officers, the Owner's consultants, the Design Professional, Design Professional's consultants, and the agents and employees of any of them shall hereafter be known as the "Indemnitees".

j. Construction Management Plan
The Construction Management Plan is prepared by the Contractor for its use in managing the Work and is not a Contract Document. The Construction Management Plan must include, at a minimum and without limitation, the following separate deliverables, which are subject to review and approval by the Design Professional and Owner:
   i. Safety and Logistics Plan;
   ii. Contractor's Construction Schedule;
   iii. Cost Management Plan, Control Estimate and Schedule of Values;
   iv. Quality Management, Commissioning and Turnover Plan; and
   v. Information Management System.

k. As-Built Documents
The As-Built Documents are the Drawings, Specifications, and addenda thereto that may be updated by the Contractor to accurately reflect the actual Work in place, including without limitation, the incorporation of Change Orders, responses to the Contractor's requests for information, Design Professional's supplemental instructions, field modifications, and other similar changes made to the Work during construction. The As-Built documents shall conform to the format and compatibility requirements of Section 3.10.1.i.

l. Work Breakdown Structure
The project's Work Breakdown Structure ("WBS") is a deliverable-oriented, hierarchical organization of the Project components to be executed by the Owner, and its accompanying numbering system. The WBS will be mutually agreed upon by the Owner and Design Professional and used by the Contractor.

m. Equal to (or Approved Equal)

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Products by manufacturers and information about those products other than those products specified in the Contract Documents which the Contractor may submit for substitution as equal to those products specified in the Contract Documents; which may be incorporated in the Work after using the process specified in the Contract Documents for review and acceptance by the Design Professional and acceptance of same by the Owner.

n. Underground Facilities
All underground lines, pipelines, conduits, ducts, encasements, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or systems at the Site, including but not limited to those facilities or systems that produce, transmit, distribute, or convey telephone or other communications, cable television, fiber optic transmissions, power, electricity, light, heat, gases, oil, crude oil products, liquid petroleum products, water, steam, waste, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

o. Force Majeure
An act of God, fire, tornado, hurricane, flood, earthquake, explosion, war on American soil, civil disturbance, labor strikes, and similar unavoidable circumstances beyond Contractor's control, not caused by the negligent act or omission of Contractor or breach of this Agreement, its Subcontractors, or anyone else for whom Contractor is responsible, and not caused by Contractor's breach of a project labor or a "no strike" agreement.

p. Knowledge
The terms "knowledge," "recognize" and "discover," their respective derivatives and similar terms in the Contract Documents, as used in reference to the Contractor, shall be interpreted to mean that which the Contractor knows or should know, recognizes or should recognize and discovers or should discover in exercising the care, skill, and diligence of a diligent and prudent contractor familiar with the Work. Analogously, the expression "reasonably inferable" and similar terms in the Contract Documents shall be interpreted to mean reasonably inferable by a diligent and prudent contractor familiar with the Work and in accordance with the highest standards in the construction profession.

q. Proposal
The offer or proposal of an Offeror submitted on the prescribed form setting forth the prices for the Work to be performed.

r. Offeror
The individual or entity that submits a Proposal directly to City.

s. Proposal Documents
The Proposal Requirements and the proposed Contract Documents including all addenda.

t. Proposal Requirements
The Advertisement or Request for Proposal, Invitation to Offerors, Instructions to Offerors, Offeror's Bond or other Proposal security, the Proposal Form, and the Proposal with any attachments.

u. Notice of Award
A written notice given by City to the Successful Offeror stating that upon timely compliance by the Successful Offeror with the conditions precedent listed in such notice, City will sign and deliver the Agreement.

v. Calendar Day

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A day consisting of 24 hours measures from midnight to the next midnight. A "day" or "Day" unless otherwise defined shall mean a Calendar Day.

w. Business Day
A day that the City conducts normal business, generally Monday through Friday, except for federal or state holidays observed by the City.

x. Notice to Proceed
A written instrument from the Owner to the Contractor requiring the Contractor to proceed with performance of activities, including, but not limited to development of submittals, ordering of materials, and any other services (the "Preconstruction Services") required to prepare for and expedite the construction of the Work as required by the Contract Documents; and complete the Work (the "Construction Services").

Section 1.2 Correlation and Intent of the Contract Documents

a. The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results. Where a conflict occurs between or within standards, specifications, and drawings, the more stringent or higher quality requirements shall apply. The precedence and coordination of the Contract Documents are as follows:

.1 Any addenda and modifications to the Drawings and Specifications take precedence over any earlier Contract Documents.

.2 Should there be a conflict within the Specifications, or within the Drawings, or between the Drawings and Specification, the Design Professional shall decide which stipulation will provide the best installation and its decision shall be final.

.3 The Drawing and Specifications are intended to coordinate with each other. Anything shown on the Drawings but not mentioned in the Specification or vice-versa, or anything not expressly set forth in either, but which is reasonably implied, shall be furnished as though specifically shown and mentioned in both without any extra charge.

.4 The Drawings, for purposes of clearness and legibility, are essentially diagrammatic, and although the sizes and locations of equipment are shown to scale wherever possible, the Contractor, Subcontractors, and Sub-subcontractors are required to familiarize themselves with all the Work required by the Contract Documents. Each Contractor, Subcontractor, and Sub-subcontractor shall properly coordinate its work with that of the Owner and all Separate Contractors. It is not within the scope of the Drawings to show all necessary offsets, obstructions or structural conditions. It shall be the responsibility of each Contractor to plan, coordinate, and install its work in such a manner so as to conform to the structure. Any conflict within the Drawings shall be referred to the Design Professional for disposition prior to the installation of any affected work.

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.5 Figured dimensions contained in the Contract Documents shall be accurately followed, even though they differ from scaled measurements. No work shown on the plans, the dimensions of which are not figured, shall be executed until instructions have been obtained from the Design Professional as to the dimensions to be used. Larger scale Drawings shall have preference over smaller scale drawings, but discrepancies shall be referred to the Design Professional for interpretation.

.6 Underground Facilities

Shown or Indicated: The information and data shown or indicated in the Contract Documents with respect to Underground Facilities at or contiguous to the Site is based on information and data furnished to City or Engineer by the owners of such Underground Facilities, including City, or by others, unless it is otherwise expressly provided in the Supplementary Conditions:

City and Engineer shall not be responsible for the accuracy or completeness of any such information or data provided by others; and

the cost of all of the following are included in the Contract Price, and Contractor shall have full responsibility for:

reviewing and checking all information and data;

verifying the actual location of those Underground Facilities shown or indicated in the Contract Documents as being within the area affected by the Work, by exposing such Underground Facilities during the course of construction;

coordination and adjustment of the Work with the owners (including City) of such Underground Facilities, during construction; and

the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.

Not Shown or Indicated: If an Underground Facility that is uncovered or revealed at the Site was not shown or indicated on the Drawings or otherwise indicated in the Contract Documents, or was not shown or indicated on the Drawings or in the Contract Documents with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith, identify the owner of such Underground Facility and give notice to that owner and to City. Contractor shall be responsible for the safety and protection of such discovered Underground Facility.

If City concludes that a change in the Contract Documents is required, a Change Order may be issued to reflect and document such consequences, subject to the provisions of Article 7.

Verification of existing utilities, structures, and service lines shall include notification of all utility companies a minimum of 48 hours in advance of construction including exploratory excavation if necessary.

.7 Reliance by Contractor on Technical Data:

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Contractor is provided certain technical data with respect to such reports and drawings for its use, but the City does not warrant or guarantee the accuracy of the information, and such information including reports and drawings are not Contract Documents. Contractor may not make any Contract Claim against City, or any of its officers, elected or appointed officials, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

the completeness or accuracy of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or

other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

the contents of other Site-related documents made available to Contractor, such as record drawings from other projects at or adjacent to the Site, or City's archival documents concerning the Site; or

any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

i. The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

b. Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

c. Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

Section 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents that are a part of this Contract.

Section 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

Section 1.5 Ownership and Use of Design Documents

a. Submittal or distribution of the Design Documents or any portion thereof to meet official laws, statutes, ordinances and regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Owner's reserved rights.

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b. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers are authorized to use and reproduce the Design Documents provided to them solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Design Documents. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers may not use the Design Documents on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner.

Section 1.6 Notice

a. Except as otherwise provided in Section 1.6.b, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement. In the event notice is provided by mail, it shall be sent certified return receipt requested.
b. Notice of Claims as provided in Section 15.1.c shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

Section 1.7 Digital Data Use and Transmission

a. The parties shall agree upon protocols governing the transmission and use of Design Documents or any other information or documentation in digital form. The parties will establish the protocols for the development, use, transmission, and exchange of digital data in writing, as mutually agreed.
b. The Contractor, at any time upon the request of the Owner, shall immediately return and surrender to the Owner, without limitation, all electronic and hard copies of any Project-related materials, records, notices, memoranda, recordings, drawings, specifications, mock-ups and any other documents furnished by the Owner or the Design Professional to the Contractor.

Section 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without written agreement to protocols governing the use of, and reliance on, the information contained in the model, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

Section 1.9 The representations and warranties contained in the Contract Documents shall survive the complete performance of the Work or earlier termination of this Agreement.

Article 2. OWNER

Section 2.1 General

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a. The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.a, the Design Professional does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

b. The Owner shall furnish the following information to a person, including the Design Professional or Contractor, who makes a request for information under Texas Government Code Chapter 2253, related to a payment or performance bond: (1) a certified copy of a payment bond and any attachment to the bond; (2) the public work contract for which the bond was given; and (3) the toll-free telephone number maintained by the Texas Department of Insurance under Subchapter B, Chapter 521, Insurance Code, for obtaining information concerning licensed insurance companies.

c. **The Owner may obtain independent review(s) of the Design Professional's Design Documents, or of any document or other materials submitted by the Contractor, by a separate architect, engineer, contractor, cost estimator or any other consultant they deem necessary and put under contract to or cause to be employed by the Owner. Such independent review shall be undertaken at the Owner's expense in a timely manner and shall not delay the orderly progress of the Work. The Design Professional and Contractor shall cooperate with such Owner's other consultants fully and respond to their reviews and comments in writing in a timely and comprehensive manner. This provision shall not be interpreted to require the Owner to obtain an independent review or imply that the Owner is in any way assuming responsibility for the work of the Design Professional and Contractor.**

Section 2.2 Evidence of the Owner's Financial Arrangements

a. Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract.

b. Following commencement of the Work and within ten (10) business days of written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.b, the Contract Time shall be extended appropriately, and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

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c. After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.
d. Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information. Notwithstanding the above, all Agreements with the Owner shall have all references to compensation redacted before disclosing to Subcontractors, sub-Subcontractors, or any other tier of vendor.

Section 2.3 Information and Services Required of the Owner

a. Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.a, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.
b. The Owner shall retain a Design Professional lawfully licensed to practice architecture or engineering as applicable, or an entity lawfully practicing architecture or engineering, as applicable, in the jurisdiction where the Project is located. That person or entity is identified as the Design Professional in the Agreement and is referred to throughout the Contract Documents as if singular in number.
c. If the employment of the Design Professional terminates, the Owner shall employ a successor whose status under the Contract Documents shall be that of the Design Professional.
d. The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.
e. The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.
f. Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.b.
g. The foregoing are, without limitation and in addition to, the other duties and responsibilities of the Owner specified in Article 6; Article 9; and Article 11.

Section 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or fails to carry out Work in accordance with the

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Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.c nor shall the exercise of the Owner's right hereunder give rise to any claim by Contractor for additions to the Contract Sum or Contract Time.

Section 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within forty-eight (48) hours from receipt of written notice from the Owner or Design Professional to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. The Design Professional may, at the direction of the Owner, pursuant to Section 9.5.a, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Design Professional's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Design Professional, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

Section 2.6 Extent of Owner Rights

a. The rights stated in this Article 2 and elsewhere in the Contract Documents are cumulative and not in limitation of any rights of the Owner granted in the Contract Documents; at law; or in equity.
b. In no event shall the Owner or Design Professional have control over, charge of, or any responsibility for construction means, methods, techniques, sequences, or procedures or for safety precautions and programs in connection with the Work. Notwithstanding anything else herein, and without limitation, any review(s), independent or otherwise, or approval(s) by the Owner or Design Professional of the Design Documents, the Contract Documents, the Contractor's Construction Management Plan(s), the Contractor's Construction Schedule, shop drawings, submittals, meeting minutes or other Contractor's services, deliverables or activities; nor the exercising of any of the rights and authority granted the Owner or Design Professional in the Contract Documents shall in any way reduce, diminish, or otherwise affect the Contractor's responsibilities, duties and accountability to the Owner for, without limitation, the construction means, methods, techniques, sequences, procedures or for safety precautions, and the provision of the Work per the requirements of the Contract Documents.
c. The Owner reserves the right to have the Contractor and/or subcontractors remove person(s) and/or personnel from any and all work on the Project for cause but without cost to the Owner. Such requests from the Owner will be made in writing and may be done directly or indirectly through the Design Professional/Engineer or on-site representative. "Cause" may include, but is not limited to, any of the following: incompetence, poor workmanship, poor scheduling abilities, poor coordination, disruptive to the project, the facility or others, poor management, cause delay or delays, will not strictly adhere to facility procedures and project requirements either willfully

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or unknowingly, insubordination, drug/alcohol use, possession of contraband, belligerent acts or actions, etc. The Contractor shall provide replacement person(s) and/or personnel acceptable to the Owner at no cost to the Owner.

Article 3. CONTRACTOR

Section 3.1 General

a. The Contractor is the person or entity identified as such in the Contract or Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located, Denton County, Texas. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.
b. The Contractor shall perform the Work in accordance with the Contract Documents.
c. The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Design Professional in the Design Professional's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

Section 3.2 Review of Contract Documents and Field Conditions by Contractor

a. Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents. Prior to execution of the Agreement, the Contractor and each Subcontractor have evaluated and satisfied themselves as to the conditions and limitations under which the Work is to be performed, including, without limitation, (i) the location, condition, layout, and nature of the Project site and surrounding areas and generally prevailing climatic conditions; (ii) anticipated labor supply and costs; (iii) availability and cost of materials, tools, and equipment; and (iv) other similar issues. The Owner and Design Professional assume no responsibility or liability for the physical condition or safety of the Project site, or any improvements located on the Project site. Except as set forth in Section 10.3, the Contractor shall be solely responsible for providing a safe place for the performance of the Work. The Owner and Design Professional shall not be required to make any adjustment in either the Contract Sum or the Contract Time in connection with any failure by the Contractor or any Subcontractor to have complied with the requirements of this Section 3.2.a.
b. Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.d, shall take field measurements of and verify any existing conditions related to that portion of the Work, and shall observe and verify the impact of any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Design Professional any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for

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information in such form as the Design Professional may require. If the Contractor performs any construction activity knowing it involves a recognized error, inconsistency or omission in the Contract Documents without such notice to the Design Professional, the Contractor shall assume appropriate responsibility for such performance and shall bear an appropriate amount of the attributable costs for correction per Section 12.2. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

c. The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Design Professional any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Design Professional may require.

d. If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Design Professional issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.b or 3.2.c, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.b or 3.2.c, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.g, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Design Professional for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities unless such error, inconsistency or omission could be ascertained from a careful study of the Contract Documents in its capacity as a contractor and not as a design professional.

Section 3.3 Supervision and Construction Procedures

a. The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work in accordance with the Contract Documents.

b. The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

c. The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

d. The Contractor shall carefully check its own work and that of Subcontractors as the Work is being performed.

e. During the finishing stages of the project, the Contractor shall make frequent inspections of the Work, with the applicable Subcontractor(s) involved, if any, with seven (7) days advance notice to the Design Professional, and the Contractor shall identify incorrect and faulty Work.

f. The Contractor shall ensure that incorrect or faulty Work is corrected immediately.

g. The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Design Professional in their

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administration of the Contract, or by tests, inspections or approvals required or performed by persons other than the Contractor.

Section 3.4 Labor and Materials

a. Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

b. The Contractor is encouraged to consider products and systems that improve the project and retain the character of the products specified, but do not alter the intent of the project. However, except in the case of minor changes in the Work authorized by the Design Professional in accordance with Sections 3.12.h or 7.4, the Contractor may make substitutions only by a formal request for substitution of products in place of those specified with the consent of the Owner, after evaluation by the Design Professional in accordance with the conditions set forth below and elsewhere in the Contract Documents, and a Change Order or Construction Change Directive. The Contractor must submit to the Design Professional and the Owner, for each proposed substitution:

.1 A full explanation of the proposed substitution and submittal of all supporting data, including technical information, catalog "cut sheets", warranties, test results, installation instructions, operating procedures, and other like information necessary for a complete evaluation of the substitution;

.2 A written explanation of the reasons the substitution is advantageous and necessary, including the benefits to the Owner and the Work in the event the substitution is acceptable;

.3 The adjustment, if any, in the Contract Sum, in the event the substitution is acceptable;

.4 The adjustment, if any, in the time of completion of the Contract and the Contractor's Construction Schedule in the event the substitution is acceptable;

.5 An affidavit stating that (1) the proposed substitution conforms to and meets all the requirements of the pertinent Specifications and the requirements shown on the Drawings, and (2) the Contractor accepts the warranty and correction obligations in connection with the proposed substitution as if originally specified by the Design Professional;

.6 Proposals for substitutions shall be submitted electronically to the Design Professional and the Owner's other consultants, if any, in sufficient time to allow no less than ten (10) business days for their respective reviews;

.7 No substitutions will be considered or allowed without the Contractor's submittal of complete substantiating data and information as stated herein; and

.8 Substitutions and alternates may be rejected without explanation and will be considered only under one or more of the following conditions: (1) the proposal is required for compliance with interpretation of code requirements or insurance regulations then existing; (2) specified products are unavailable through no fault of the Contractor; (3) subsequent information discloses the

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inability of specified products to perform properly or to fit in the designated space; (4) the manufacturer/fabricator refuses to certify or guarantee the performance of the specified product as required; and (5) when, in the judgment of the Owner or the Design Professional, a substitution would be substantially in the Owner's best interests, in terms of cost, time, or other considerations; and

.9 Whether or not any proposed substitution is accepted by the Owner, the Owner's other consultants, if any (if any), or the Design Professional, the Contractor shall reimburse the Owner for any fees charged by the Design Professional, and the Owner's other consultants for evaluating each proposed substitute.

c. The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them. Smoking and chewing of tobacco products is prohibited in enclosed new construction. No glass bottles shall be brought on the construction site or Owner's property by any construction personnel.

d. All work under this Agreement shall be performed in a skillful and workmanlike manner in accordance with the highest industry standards.

e. The Contractor shall only employ or use labor in connection with the Work capable of working harmoniously with all trades, crafts, and any other individuals associated with the Project. The Contractor shall also use best efforts to minimize the likelihood of any strike, work stoppage, or other labor disturbance.

.1 If the Work is to be performed by trade unions, the Contractor shall make all necessary arrangements to reconcile, without delay, damage, or cost to the Owner and without recourse to the Design Professional or the Owner, any conflict between the Contract Documents and any agreements or regulations of any kind at any time in force among members or councils that regulate or distinguish the activities that shall not be included in the work of any particular trade; and

2 In case the progress of the Work is affected by any undue delay in furnishing or installing any items or materials or equipment required under the Contract Documents because of such conflict involving any such labor agreement or regulation, the Owner may require that other material or equipment of equal kind and quality be provided pursuant to a Change Order or Construction Change Directive.

Section 3.5 Warranty

a. The Contractor warrants to the Owner and Design Professional that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform with the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal

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wear and tear and normal usage. If required by the Design Professional, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. **THE CONTRACTOR SHALL DEFEND AND HOLD THE OWNER HARMLESS AGAINST ANY CLAIM, DEMAND, LOSS, OR DAMAGE BY ANY BREACH OF THIS WARRANTY, AND CONTRACTOR ACKNOWLEDGES IT SHALL NOT LIMIT SUCH WARRANTY BY THE PROVISIONS OF SECTION 12.2.**

b. All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner and shall commence in accordance with Section 9.8.d.

c. When written warranties are specified, the document shall include the following information:
Name and address of Project and Owner;
Article, materials, or systems covered;
Name and address of Installer;
Name and address of Contractor; and
Signature of individual authorized to sign contracts for the company issuing the warranty.

d. The following minimum warranty terms shall be incorporated:

.1 Duration shall be one year or as otherwise specified, dated from the Date of Substantial Completion;

.2 The article, material or system is free from defective materials and workmanship;

.3 Costs of repair or replacement shall not accrue to the Owner, including, without limitation, repair or replacement of other work disturbed by, or because of, repair or replacement; and

.4 The warranty period of two years, or as otherwise specified, shall recommence upon the identification and completion by Contractor and acceptance by Owner of any warranty claim during the initial two-year (2) warranty period.

e. Warranties which are provided by a manufacturer for its product shall be received by the Contractor, filled out and filed with the manufacturer or other appropriate entity in coordination with the Owner. Certificates or registration stubs shall be included with the record documents submitted for the Owner upon completion of the Work. The Owner shall administrate manufacturer's warranties/guarantees after expiration of the Contractor's warranty.

f. Temporary or trial usage by the Owner of any mechanical device, machinery, apparatus, equipment, or any work or material supplied under the Contract Documents before final completion and written acceptance by the Design Professional and Owner shall not be construed as evidence of the Design Professional's or the Owner's acceptance of same, or the commencement of any warranty periods.

g. The Owner has the privilege of such temporary or trial usage, for such reasonable time as the Owner, or the Design Professional deem proper. The Contractor shall make no claims for damage or injury to, or breaking of, any parts of such work which may be caused by weakness or insufficiency of structural parts, or by defective materials or workmanship.

h. The Contractor may, without cost to the Owner, make such trial usage. However, trials shall only be conducted with the Design Professional's prior approval and under its observation as may be required by either of them. Equipment and/or materials shall be replaced or returned to "as new" condition prior to acceptance by the Owner.

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i. The Contractor agrees to assign to the Owner at the time of final completion of the Work any and all manufacturer's warranties relating to materials and labor used in the Work and further agrees to perform the Work in such manner so as to preserve any and all such manufacturer's warranties.

j. If necessary as a matter of law, the Contractor may retain the right to enforce directly any such manufacturers' warranties during the one (1) year period following the date of Substantial Completion described in Section 12.2.b.

Section 3.6 Taxes

The Contractor shall, to the extent not exempted under Section 13.11.i herein, pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect. In no event shall the Owner pay the Contractor for taxes that were not properly due or for which the Owner is exempt from paying under Texas law.

Section 3.7 Permits, Fees, Notices and Compliance with Laws

a. Unless otherwise provided in the Contract Documents, the Owner shall secure and pay for the building permit. The Owner shall also pay for any applicable gas, water, sewer and electrical service application fees; assessments against the property, including property tax, developmental excise and similar taxes; sewer, water, and related utility tap fees; and sewer plant improvement fees, unless exempted under Texas law. The Contractor shall secure and pay for all other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

b. The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

c. If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, regardless of whether such work is in accordance with Contract Documents, and without notice to the Design Professional that the Contract Documents are at variance with applicable laws, ordinances, rules, or regulations, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction. Codes and ordinances shall take full and complete precedence over anything contained in the Drawings, Specifications, or other Contract Documents, except where the Contract Documents call for Work or materials of higher standards than those required by codes or ordinances, in which case, the Contract Documents shall govern. Nothing contained in the Contract Documents shall be construed as authority for the Contractor to violate any applicable codes or ordinances in effect at the site.

d. Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Design Professional before conditions are disturbed and in no event later than

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seven (7) days after first observance of the conditions. The Design Professional will promptly investigate such conditions and, if, in the Design Professional's opinion, they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If, in the Design Professional's opinion, the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Design Professional shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Design Professional's recommendation, that party may submit a Claim as provided in Article 15.

i. In no event shall any adjustment in the Contract Sum or Contract Time be made for conditions which should have been known to the Contractor or would have been noticed by a Contractor of similar size and experience pursuant to its on-site inspection; by way of or conditions referenced in any other inspections or tests concerning the site which have been made available to the Contractor or have been performed by the Contractor or its Subcontractors; are part of the Contract Documents; or are part of the materials provided by the Contractor to be used in constructing the improvements.

e. If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Design Professional. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

f. The Contractor shall comply with all applicable laws, statutes, rules, codes, orders, regulations, and ordinances, including, but not limited to, all immigration, environmental and safety laws, statutes, rules, codes, orders and regulations.

.1 The Contractor shall also maintain at all times during the term of the this Agreement (and for the time otherwise required by law) all records required by the United States Citizenship and Immigration Services ("USCIS"), including, without limitation, the completion and maintenance of the Form I-9 for each of Contractor's employees and shall respond at all times during the term of this Agreement in a timely fashion to any inspection request related to such I-9 forms by the Contractor, Owner or governmental agency or authority;

.2 Furthermore, during the term of this Agreement, and for the time otherwise required by law, Contractor shall cause its officers, directors, managers, agents, and employees to cooperate fully in all respects with any audit, inquiry, inspection, or investigation that may be conducted by the USCIS of the Contractor or any of its employees or subcontractors;

.3 The Contractor shall immediately, and in any event within two (2) hours of Contractor's first notice of an event described in this Section 3.7.f notify the Owner in writing and by in-person voice communications (not voicemail) of any unscheduled inspections, raids, investigations, inquiries, visits, or audits

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conducted by the USCIS, OSHA, or any other governmental agency or authority related to environmental, immigration, or employee safety issues of the Contractor, its agents, employees, its Design Professional, Subcontractors, or Sub-subcontractors;

.4 The Contractor shall, on a monthly basis during the term of this Agreement, conduct an audit of the I-9 forms for its employees and shall promptly correct any defects or deficiencies that are identified as a result of such audit;

.5 The Owner may, at its sole discretion, terminate this Agreement immediately if, at any time during the term of this Agreement, the Contractor violates or is in breach of any provision of this Section 3.7.f or the USCIS determines that Contractor has not complied with any of the immigration laws, statutes, rules, codes, or regulations of the United States or any applicable state laws or regulations, or any applicable local ordinances, including, without limitation, the Immigration Reform and Control Act of 1986, as amended, and the Illegal Immigration Reform and Immigration Responsibility Act of 1996, as amended, and any successor statutes thereto;

.6 If an employee of the Contractor or if the Contractor is later determined to not have valid I-9 information then that employee shall be removed and barred from the Project site at the Contractor's expense; and

.7 The Contractor shall require the Subcontractors, Sub-subcontractors and material suppliers to make the representations and warranties set forth in this Section 3.7.f and to be bound by the same requirements set forth herein.

Section 3.8 Allowances

a. The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

b. Unless otherwise provided in the Contract Documents,

.1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

.2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and

.3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.b.1 and (2) changes in Contractor's costs under Section 3.8.b.2.

c. Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

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Section 3.9 Superintendent

a. The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work including, but not limited to, weekends, evenings and nights, or as otherwise reasonably and mutually agreed in writing with the Owner, until all punch list items have been completed to the satisfaction of the Design Professional. No subcontractor shall perform work on the site without the presence of the Superintendent or Assistant Superintendent. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

b. The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Design Professional of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Owner or the Design Professional may notify the Contractor, stating whether the Owner or the Design Professional (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Design Professional to provide notice within the 14-day period shall constitute notice of no reasonable objection.

c. All of the Contractor's proposed on-site personnel must be approved by the Design Professional and Owner. The Contractor shall not employ a proposed superintendent to whom the Owner or Design Professional has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed. Substitution or other significant personnel changes which may affect the Contractor's on-site personnel must be preceded by written notification of the Design Professional and Owner no less than seven (7) business days before the anticipated event. Such proposed changes must be approved by the Design Professional and Owner. The Contractor shall designate a second person in charge in writing in the event the Superintendent is temporarily absent due to illness, vacation, or any other cause(s).

Section 3.10 Contractor's Construction and Submittal Schedules

i. Where the Contract is based on a Stipulated Sum, the Contractor, immediately after being awarded the Work, and before execution of the Agreement, shall meet at a Preconstruction Conference with the Owner for the purpose of reviewing the Contractor's proposed Construction Management Plan; assisting the Owner with further developing the Master Project Schedule; and integrating the Work of the Contractor into that of the Owner and all Separate Contractors, if any.

ii. The Contractor's Project Schedule must include all the following:

.1 Use precedence format, critical path method scheduling without the use of artificial activity constraints or "negative float";

.2 Use software, techniques and methods satisfactory to the Owner;

.3 Provide an electronic and graphic representation of all activities and events that will occur during performance of the Work;

.4 Identify each subproject, to include, without limitation preconstruction, construction, commissioning, turnover of the Work, and Owner's occupancy;

.5 Set forth dates that are critical in ensuring the timely and orderly completion of the Work in accordance with the requirements of the Contract Documents (hereinafter referred to as "Contractual Milestone Dates");

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.6 Upon review by the Design Professional and written review and acceptance by the Owner of the Contractual Milestone Dates, the Contractor's Project Schedule shall be deemed part of the Contract Documents and provided to the Owner as a submittal;

.7 If not accepted, the Contractor's Project Schedule shall be promptly revised by the Contractor in accordance with the recommendations of the Owner and resubmitted for acceptance;

.8 Submission of an updated Contractor's Project Schedule with each Application for Payment shall be a mandatory condition precedent to the payment by the Owner to the Contractor pursuant to an Application for Payment, and the Owner shall not be obligated to make payment if the Contractor fails to include an updated Contractor's Project Schedule reflecting the then-current conditions on the Project and the anticipated progress of Work based on those conditions; and

.9 All requests for change orders, modifications or additional compensation from the Contractor affecting the Contract Time or Contract Sum shall include a detailed schedule with both data and graphics showing the specific effect of the changed, modified or differing condition(s) on the critical path of the Contractor's Project Schedule.

iii. The Contractor, prior to preparing the Construction Management Plan and attending the Preconstruction Conference, will have reviewed the sequences, durations, sequencing and dependencies of activities, material deliveries, and sequenced man-hour staffing to complete the Work. Work activities which have an installed value of twenty thousand dollars ($20,000) or more will be broken down into major products or operations except where mutually agreed otherwise by Contractor and Owner, and these values cost-loaded into the Contractor's Project Schedule as deemed necessary by the Owner. Upon request by the Owner, the Contractor shall support values given for each work activity with data that will substantiate its correctness. The Owner may require the Contractor to show separate work activities and Contractual Milestones for, as examples only and without limitation: Substructure Completion; Superstructure Completion; Building Exterior Skin Completion; Interior Finishes Completion; Owner's Beneficial Occupancy, and other similar dates the Owner, at its sole discretion deems important to the Project.

iv. In the event the Contractor does not timely provide the Contractor's Construction Management Plan with an acceptable Contractor's Project Schedule containing such elements, information, and processes in a form and with a level of detail acceptable to the Design Professional and the Owner, the Owner may, at the Owner's discretion, unilaterally generate the target Contractor's Project Schedule at the Contractor's expense, and impose such schedule, sequences, logic, and/or durations on the Contractor as it deems necessary to complete the Work, or the Owner may declare the Contractor in breach of contract. Whether or not the Owner decides to implement this option, all other contractual provisions relating to breach of contract will continue to be in full force and apply without modification. The Owner may deduct from the Contractor's Application(s) for Payment the amount paid by the Owner for generating the Contractor's Project Schedule.

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v. Upon completion of the Master Project Schedule, and acceptance by the Owner and all Separate Contractors, the Master Project Schedule shall supersede previously submitted schedules. Each updated Master Project Schedule shall supersede previous updates.

b. The Contractor shall, at the Preconstruction Conference, and as a sub-system of its Contractor's Project Schedule, prepare an easily isolated, sorted and separately viewed submittal schedule, and thereafter update it as necessary to maintain a current submittal schedule, and shall submit such schedule(s) for the Design Professional's approval. The Design Professional's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's Construction Schedule, and (2) allow the Design Professional reasonable time to review submittals. If the Contractor fails to submit an approvable submittal schedule thirty (30) days prior to the date established for commencement of the Work, the Contractor shall not mobilize on site, or be entitled to any increase in Contract Sum or extension of Contract Time based on the delay of the Work or time required for review of submittals during the prosecution of the Work.

c. The Contractor shall perform the Work in general accordance with the most recent Contractor's Project Schedules submitted to the Owner and Design Professional and incorporated into the approved Master Project Schedule.

d. The Owner together with the Contractor, will monitor the Master Project Schedule, and incorporate the Contractor's updates to its portions of this overall schedule. As all Separate Contractors are also obligated to follow the Master Project Schedule and their respective schedules therein, they will be required to actively cooperate and participate in the preparation and updating of their portion of this schedule, as well as updating the overall Master Project Schedule by the Owner. The Contractor will be kept updated on all significant Master Project Schedule changes materially affecting the Contractor's Project Schedule.

e. The Contractor will produce a Short Interval Schedule containing activities for not less than one (1) previous week and the next three (3) weeks, and which focuses on the major weekly work activities of each subsystem. At each weekly meeting this Short Interval Schedule will be reviewed by the Contractor with all affected Subcontractors and the Owner.

f. In the event of substantial delay, if excusable under the Contract, for which extension of the Contract Time has or will be granted, the Owner will review and may require revision by the appropriate contractor(s) of affected component of the Master Project Schedule as required by the specific applicable situation(s), and with the cooperation of the Separate Contractors on the Project.

g. The Contractor shall, at mutually agreed intervals, submit to the Owner and Design Professional a progress report stating, without limitation, labor forces mobilized and working on site; areas worked in or on; percent complete of current work activities; any potential schedule or coordination problems; material deliveries received; site visitors; and other information as required by the Owner.

h. The Contractor shall monitor the progress of the Work for conformance with the requirements of the Contractor's Project Schedule and shall promptly advise the Owner of any delays or potential delays. The accepted Contractor's Project Schedule shall be updated to reflect actual conditions as frequently as mutually agreed by the Contractor and Owner; but in no event less frequently than with each Application for Payment; and at other times as may be reasonably requested by the Owner or Design Professional. In the event any progress report or schedule update indicates any

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actual or potential delays, the Contractor shall, using both the most currently approved Contractor's Project Schedule as a baseline for comparison, and a written narrative, propose an affirmative plan to correct the delay (hereinafter referred to as the "Proposed Recovery Schedule") which must include the following:

.1 The Proposed Recovery Schedule will show the results of working additional shift or days, adding additional labor, and any of the other actions specified in Section 8.4, if necessary, all as described in the accompanying narrative;

.2 The Proposed Recovery Schedule will be reviewed by the Owner, and the Contractor will promptly and diligently make all adjustments to the Proposed Recovery Schedule reasonably requested as a result of such review.

.3 The Proposed Recovery Schedule shall become the most current, approved Contractor's Project Schedule upon its approval by the Owner, issuance of a Change Order for the purpose by the Design Professional; and signing of such Change Order by the Contractor, Design Professional, and Owner, in that order; and

.4 In no event shall any progress report, schedule update or Proposed Recovery Schedule constitute an adjustment in the Contract Time, any Contractual Milestone Date, or the Contract Sum unless any such adjustment is agreed to by the Owner and authorized pursuant to Change Order.

i. In the event either the Owner or Design Professional determine that the performance of the Work, as of a Contractual Milestone Date, has not progressed or reached the level of completion required by the Contract Documents, the Owner shall have the right to order the Contractor to take corrective measures necessary to expedite the progress of construction, including, without limitation those further specified in Section 8.4.

j. The Owner may exercise the rights furnished the Owner under or pursuant to this Section 3.10 and Section 8.4 as frequently as the Owner deems necessary to ensure that the Contractor's performance of the Work will comply with any Contractual Milestone Date or completion date set forth in the Contract Documents.

k. The Owner shall have the right to direct a postponement or rescheduling of any date or time for the performance of any part of the Work that may interfere with the operation of any part of the Owner's organization or any stakeholders or invitees thereof. The Contractor shall, upon the Owner's or Design Professional's request, reschedule such portion of the Work during hours when the interference to the Owner's organization, or any stakeholders or invitees thereof, will be minimized or eliminated. Any postponement, rescheduling, or performance of the Work under this Section 3.10.k may be grounds for an extension of the Contract Time, if permitted under Section 8.3.a; and an equitable adjustment in the Contract Sum if the performance of the Work was properly scheduled by the Contractor in compliance with the requirements of the Contract Documents; and to the extent such rescheduling or postponement is required for the convenience of the Owner.

l. Documents and Samples at the Site

The Contractor shall make available, to the Owner, Design Professional or their designees, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and

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selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy and delivered to the Design Professional for submittal to the Owner upon completion of the Work as a record of the Work as constructed. The Contractor shall make available to the Owner or Design Professional for inspection and copying the record copy of the drawings, specifications, addenda, Change Orders and other Modifications, including all such documents maintained by the Contractor in electronic format, upon reasonable request of the Owner or Design Professional and, in any event, within twenty-four (24) hours of receipt by Contractor of a request from Owner or Design Professional for such review and/or copying. The Owner or Design Professional may request the record copy of the As-Built Documents, specifications, addenda, Change Orders and other modifications of the Work to be updated before Substantial Completion to reflect the most current condition of the Project, as additional Cost of the Work paid as a Change Order at the Owner's expense. The Owner or Design Professional may require the Contractor to furnish the As-Built Documents in electronic format and may make copies of them prior to completion of the Work at the Owner's expense.

i. The Contractor shall provide final electronic files and one "hard" copy of the Drawings and Specifications to the Owner updated to reflect the final condition of the Project with the final Application for Payment as a condition precedent to final payment.

Section 3.12 Shop Drawings, Product Data and Samples

a. Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.
b. Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.
c. Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.
d. Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Design Professional is subject to the limitations of Section 4.2.g. Informational submittals upon which the Design Professional is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Design Professional without action.
e. The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Design Professional, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, after Contractor has verified the information contained within said submittals is in accordance with representations required by Section 3.12.f and in accordance with the submittal schedule approved by the Design Professional or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

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f. By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Design Professional that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents and (4) verified the information contained within said submittals is in accordance with all applicable Federal, state and local codes or ordinances in effect at the site.

g. The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Design Professional. Should the Contractor, Subcontractors, or Sub-subcontractors install, construct, erect or perform any portion of the Work without approval of any requisite submittal, the Contractor shall bear the costs, responsibility, and delay for removal, replacement, and/or correction of any and all items, material, and /or labor.

h. The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Design Professional's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Design Professional of such deviation at the time of submittal and (1) the Design Professional has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Design Professional's approval thereof.

i. The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Design Professional on previous submittals. In the absence of such notice, the Design Professional's approval of a resubmission shall not apply to such revisions.

    i. Copies of all approved Shop Drawings, Product Data, Samples and similar submittals shall be preserved in an orderly manner and delivered by the Contractor to the Owner upon Final Completion.

j. The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

    i. If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor, the Owner and the Design Professional will specify all performance and design criteria that such services must satisfy in the Contract Documents. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional who shall comply with reasonable

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requirements of the Owner regarding qualifications and insurance. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Design Professional. The Owner and the Design Professional shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Design Professional have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.j, the Design Professional will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

ii. If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Owner and the Design Professional at the time and in the form specified by the Design Professional.

Section 3.13 Use of Site, Delivery and Storage

a. The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

b. The Contractor shall coordinate the Contractor's operations with, and secure the approval of, the Owner before using any portion of the site.

c. The Contractor shall take reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury or loss to, all persons at the Project site; all property at the Project site; and all persons or property adjacent thereto, which includes, but is not limited to, the all the following duties and acknowledgments:

.1 The Contractor acknowledges the Project site comprises and/or may be adjacent to existing structures and that these site areas may be occupied during the performance of some portions of this Contract;

.2 The Work shall be performed, to the fullest extent reasonably possible, in such a manner that public areas adjacent to the site of the Work shall be free from all debris, building materials, and equipment likely to cause interference with adjacent stakeholders or create hazardous conditions;

.3 The Contractor shall be responsible for the mitigation and/or abatement of all noise, dust, fumes, traffic or other by-product of construction activity that, in the opinion of the Owner or the Design Professional, have an adverse affect on the quality of life or productivity for Project stakeholders, the Owner's current operations, or the Owner's employees. Such mitigation and/or abatement shall be performed in manner and with a result completely and wholly acceptable to the Owner and Design Professional;

.4 The Contractor shall control its personnel and the Subcontractors on site, especially regarding the use of alcohol or profanity, dressing in an inappropriate manner, parking in an inappropriate place, or other activities deemed to be inappropriate, to the satisfaction of the Owner and Design Professional. Repeat

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offenses will cause the Owner or Design Professional to require, through the Contractor, the temporary or permanent removal of the offending individuals, Subcontractor(s) or Sub-subcontractor(s) from the site;

.5 The Contractor shall, at a minimum, secure the site by erecting and maintaining a 6'-0" chain link fence around the perimeter of the construction site. This fence shall remain intact until such time the site becomes secure in the opinion of the Contractor, as a result of construction progress (by way of example, and without limitation, completion of site grading and backfill, installation of doors and windows, etc.);

.6 The Contractor shall furnish and maintain sufficient sanitary facilities for its own forces and those of any Subcontractor or Sub-subcontractor. The facilities of any existing, nearby buildings will not be available for construction use; and

.7 The Contractor is advised that the project site area is subject to, among other inclement weather, unpredictable and high winds. When all or a portion of the Work is suspended for any reason, the Contractor shall securely fasten down all coverings and stored materials on site and fully protect the Work, as necessary, from injury or damage by any cause and to prevent possible damage caused by flying materials and debris.

d. The Contractor shall ensure that the Work, at all times, is performed in a manner that affords reasonable access, both vehicular and pedestrian, to the site of the Work and all adjacent areas, which includes, but is not limited to, all of the following duties:

.1 The access to the site shall be maintained in compliance with all local, state, and Federal code and life safety requirements for ingress by first responders and other similar emergency requirements;

.2 The Contractor shall inform the Owner, Design Professional and any officials referenced in Section 3.13.f in writing a minimum of thirty (30) calendar days prior to any disruption of access, specifically and graphically showing the nature of the disruption, as well as the hours it will be disrupted. Such disruption will be subject to Owner's and Design Professional's approval, such approval not to be unreasonably withheld;

.3 The Owner shall be responsible for snow removal to the limits of the construction site only so far that the Contractor will have access to the entrance to the construction area; and

.4 Snow removal within the limits of work and/or for the purpose of performing and protecting work by individual contractors is the duty of the Contractor.

e. During the performance of the Work, the Contractor, its Subcontractors, Sub-subcontractors, suppliers and their employees agree they shall:

.1 Use such entrances to the construction site that may be designated by the Owner;

.2 Perform the Work at such times of the day and days of the week as may be designated by the Owner; and

.3 Accept that these entrances and times may be reviewed and changed from time to time by the Owner.

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f. The Contractor shall notify all public utility companies a minimum of two (2) business days prior to the commencement of any work by it or its Subcontractors in the vicinity of the utilities. No work shall commence until the utilities have been located and staked by the utility company or written consent from the Owner to proceed has been given to the Contractor. If the utility service must be interrupted, the Contractor shall, at Contractor's sole cost and expense, notify the head of the local administrative services (by way of example only, and without limitation, the city manager, the mayor, the city or county clerk, etc. as applicable) and the utility users affected by the interruption. Such notice shall consist of direct written communication, publication in a local newspaper, and/or announcement on local radio or television stations, whichever is most reasonably calculated to give the most effective notice to such utility users.

g. The Contractor shall exercise due diligence in seeing that all equipment, material, and supplies are delivered in advance of the time they are needed on the job and shall properly store and protect same at the Contractor's expense.

h. Notwithstanding any other provision herein, the Contractor shall take all necessary measures to store materials on site for which payment has been requested by the Contractor or been made by the Owner so that they shall not deteriorate, be damaged or be stolen, which includes, but is not limited to, all the following:

.1 Only materials and equipment that are to be used directly in the Work shall be brought to and stored on the Project site by the Contractor;

.2 Protection of construction materials and equipment stored at the Project site from fire, weather, burglary, pilferage, vandalism and mischief, damage, and all other adversity; and the care and protection of materials and Work installed in the building is solely the responsibility of the Contractor;

.3 The Contractor shall bear sole responsibility for the restoration of damaged Work and replacement of damaged or stolen materials at no additional cost to the Owner; and

.4 After equipment is no longer required for the Work, it shall be promptly removed from the Project site.

i. The Contractor shall not deliver any materials to the site which are not to be installed by same Contractor without fifteen (15) day's advance notice in writing to the Owner of the location, date, and time of such delivery to allow proper coordination. Such materials shall be received jointly by a representative of the Contractor and a representative of the Owner, who shall agree, and the Contractor shall document such agreement in writing:

.1 The materials delivered are undamaged, or if damaged, such damage is documented by digital photo(s);

.2 They are in the quantities shown on the purchase order, invoice or bill of lading accompanying the shipment or delivery or otherwise provided;

.3 The storage conditions are adequate for the purposes; and

.4 The Contractor has accepted responsibility for insurance and ongoing protection per Section 10.2 for such material until it is released to a third party authorized in writing by the Owner to receive it.

Section 3.14 Cutting and Patching

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a. The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.
b. The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

Section 3.15 Cleaning Up

a. The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract and shall be responsible for daily clean-up of construction materials and dust control. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project and shall clean all glass surfaces and leave the Work "broom clean", or its equivalent, except as otherwise specified.
b. If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

Section 3.16 Access to Work

The Contractor shall provide the Owner and Design Professional and their representatives with access to the Work in preparation and progress at all times wherever located, and shall provide proper and safe facilities for such access.

Section 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall defend and hold the Owner and Design Professional harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Design Professional. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Design Professional.

Section 3.18 Indemnification

a. **CONTRACTOR DOES HEREBY AGREE TO WAIVE ALL CLAIMS, RELEASE, INDEMNIFY, DEFEND AND HOLD HARMLESS INDEMNITEES FROM AND AGAINST ANY AND ALL CITATIONS, CLAIMS, COSTS, DAMAGES, DEMANDS, EXPENSES, FINES, JUDGMENTS, LIABILITY, LOSSES, PENALTIES, SUITS OR CAUSES OF ACTION OF EVERY KIND INCLUDING ALL EXPENSES OF LITIGATION AND/OR SETTLEMENT, COURT COSTS AND ATTORNEY FEES**

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WHICH MAY ARISE BY REASON OF INJURY TO OR DEATH OF ANY PERSON OR FOR LOSS OF, DAMAGE TO, OR LOSS OF USE OF ANY PROPERTY OCCASIONED BY ERROR, OMISSION, OR NEGLIGENT ACT OF CONTRACTOR, ITS SUBCONTRACTORS, ANY OFFICERS, AGENTS OR EMPLOYEES OF CONTRACTOR OR ANY SUBCONTRACTORS, INVITEES, AND ANY OTHER THIRD PARTIES OR PERSONS FOR WHOM OR WHICH CONTRACTOR IS LEGALLY RESPONSIBLE, IN ANY WAY ARISING OUT OF, RELATING TO, RESULTING FROM, OR IN CONNECTION WITH THE PERFORMANCE OF THIS CONTRACT, AND CONTRACTOR WILL AT ITS OWN COST AND EXPENSE DEFEND AND PROTECT OWNER FROM ANY AND ALL SUCH CLAIMS AND DEMANDS.

CONTRACTOR DOES HEREBY AGREE TO WAIVE ALL CLAIMS, RELEASE, INDEMNIFY, DEFEND AND HOLD HARMLESS INDEMNITEES FROM AND AGAINST ANY AND ALL CITATIONS, CLAIMS, COSTS, DAMAGES, DEMANDS, EXPENSES, FINES, JUDGMENTS, LIABILITY, LOSSES, PENALTIES, SUITS OR CAUSES OF ACTION OF EVERY KIND INCLUDING ALL EXPENSES OF LITIGATION AND/OR SETTLEMENT, COURT COSTS AND ATTORNEY FEES FOR INJURY, SICKNESS, DISEASE OR DEATH OF ANY EMPLOYEE, AGENT OR REPRESENATIVE OF CONTRACTOR OR ANY OF ITS SUBCONTRACTORS, REGARDLESS OF WHETHER THE CITATIONS, CLAIMS, COSTS, DAMAGES, DEMANDS, EXPENSES, FINES, JUDGMENTS, LIABILITY, LOSSES, PENALTIES, SUITS OR CAUSES OF ACTION ARISE IN WHOLE OR IN PART FROM THE NEGLIGENCE OF INDEMNITEES. IT IS THE EXPRESS INTENTION OF THE PARTIES HERETO THAT THE INDEMNITY PROVIDED FOR IN THIS PARAGRAPH IS AN INDEMNITY BY CONTRACTOR FOR THE BENEFIT OF THE OWNER FROM THE CONSEQUENCES OF OWNER'S NEGLIGENCE, WHETHER THAT NEGLIGENCE IS A SOLE OR CONCURRING CAUSE OF THE INJURY, SICKNESS, DISEASE OR DEATH OF CONTRACTOR'S EMPLOYEE OR EMPLOYEE OF ANY OF ITS SUBCONTRACTORS.

IN ANY AND ALL CLAIMS AGAINST ANY PARTY INDEMNIFIED HEREUNDER BY ANY EMPLOYEE OF THE CONTRACTOR, ANY SUB-CONTRACTOR, ANYONE DIRECTLY OR INDIRECTLY EMPLOYED BY ANY OF THEM OR ANYONE FOR WHOSE ACTS ANY OF THEM MAY BE LIABLE, THE INDEMNIFICATION OBLIGATION HEREIN PROVIDED SHALL NOT BE LIMITED IN ANY WAY BY ANY LIMITATION ON THE AMOUNT OR TYPE OF DAMAGES, COMPENSATION OR BENEFITS PAYABLE BY OR FOR THE CONTRACTOR OR ANY SUB-CONTRACTOR UNDER WORKMEN'S COMPENSATION OR OTHER EMPLOYEE BENEFIT ACTS.

INDEMNIFIED ITEMS SHALL INCLUDE, BUT NOT BE LIMITED TO, ATTORNEYS' FEES AND COSTS, COURT COSTS AND SETTLEMENT COSTS, INCURRED BY AN INDEMNIFIED INDIVIDUAL OR ENTITY IN ATTEMPTING TO ENFORCE THIS INDEMNITY.

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THE CONTRACTOR IS NOT REQUIRED TO INDEMNIFY OR DEFEND THE DESIGN PROFESSIONAL, ANY LICENSED ENGINEER, OR AN AGENT, SERVANT, OR EMPLOYEE OF THE DESIGN PROFESSIONAL OR LICENSED ENGINEER FROM LIABILITY THAT MAY ARISE FROM DEFECTS IN THE PLANS, DESIGNS OR SPECIFICATIONS OR NEGLIGENCE ON THE PART OF THE DESIGN PROFESSIONAL OR LICENSED ENGINEER IN THE RENDITION OR CONDUCT OF PROFESSIONAL DUTIES ARISING FROM THE CONTRACT AND THE PLANS DESIGNS OR SPECIFICATIONS THAT ARE PART OF THE CONSTRUCTION CONTRACT AS SET FORTH IN CHAPTER 130 OF THE TEXAS CIVIL PRACTICE AND REMEDIES CODE.

b. **THE CONTRACTOR'S INDEMNITY OBLIGATIONS UNDER THIS SECTION 3.18 SHALL ALSO SPECIFICALLY INCLUDE, WITHOUT LIMITATION, ALL FINES, PENALTIES, DAMAGES, LIABILITY, SAFETY VIOLATIONS, COSTS, EXPENSES (INCLUDING, WITHOUT LIMITATION, REASONABLE ATTORNEYS' FEES), AND PUNITIVE DAMAGES, IF ANY, ARISING OUT OF, OR IN CONNECTION WITH ANY:**

.1 VIOLATION OF OR FAILURE COMPLY WITH ANY LAW, STATUTE, ORDINANCE, RULE, REGULATION, CODE OR REQUIREMENT OF A PUBLIC AUTHORITY THAT BEARS UPON THE PERFORMANCE OF THE WORK BY THE CONTRACTOR, A SUBCONTRACTOR OR ANY PERSON OR ENTITY FOR WHOM EITHER IS RESPONSIBLE;

.2 MEANS, PROCEDURES, TECHNIQUES, SAFETY PRECAUTIONS, OR SEQUENCES OF EXECUTION OR PERFORMANCE OF THE WORK; AND

.3 FAILURE TO SECURE AND PAY FOR PERMITS, FEES, APPROVALS, LICENSES, AND INSPECTION AS REQUIRED UNDER THE CONTRACT DOCUMENTS, OR ANY VIOLATION OF ANY PERMIT OR OTHER APPROVAL OF A PUBLIC AUTHORITY APPLICABLE TO THE WORK, BY THE CONTRACTOR, A SUBCONTRACTOR, OR ANY PERSON OR ENTITY FOR WHOM EITHER IS RESPONSIBLE.

c. **THE CONTRACTOR SHALL INDEMNIFY AND HOLD HARMLESS ALL OF THE INDEMNITEES SET OUT IN SECTION 3.18.a FROM AND AGAINST ANY COSTS AND EXPENSES (INCLUDING REASONABLE ATTORNEYS' FEES) INCURRED BY ANY OF THE INDEMNITEES IN ENFORCING ANY OF THE CONTRACTOR'S DEFENSE, INDEMNITY, AND HOLD-HARMLESS OBLIGATIONS UNDER THIS CONTRACT.**

Article 4. DESIGN PROFESSIONAL

Section 4.1 General

a. The Design Professional is the person or entity retained by the Owner pursuant to Section 2.3.b and identified as such in the Agreement.

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b. Duties, responsibilities, and limitations of authority of the Design Professional as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Design Professional. Consent shall not be unreasonably withheld.

Section 4.2 Administration of the Contract

a. The Design Professional will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Design Professional issues the final Certificate for Payment. The Design Professional will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

b. The Design Professional will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, as the Work progresses and when fully completed, will be in accordance with the Contract Documents. However, the Design Professional will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Design Professional will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, except as provided in Section 3.3.a.

c. On the basis of the site visits, the Design Professional will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Design Professional will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Design Professional will not have control over or charge of and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

i. **NEITHER THE OWNER NOR THE DESIGN PROFESSIONAL NOR THE OWNER'S OTHER CONSULTANTS SHALL BE RESPONSIBLE OR LIABLE FOR THE SAFETY PROGRAM(S) DEVELOPED BY THE CONTRACTOR OR ITS SUBCONTRACTORS FOR THE SAFETY OF PERSONS AND PROPERTY, OR FOR COMPLIANCE WITH STATUTES, RULES, REGULATIONS, AND ORDERS APPLICABLE TO CONDUCT THE WORK. SHOULD ANY CONTRACTOR OR THEIR SUBCONTRACTOR(S), OR THE SUB-SUBCONTRACTOR(S) MAKE A CLAIM AGAINST THE INDEMNITEES, OR SHOULD THEY OR ANY GOVERNMENTAL ENTITY BRING ANY ACTION OR LEVY ORAND FINE OR PENALTY AGAINST THE INDEMNITEES ON ACCOUNT OF ANY SAFETY-RELATED DAMAGE OR VIOLATION OF LAW ALLEGED TO HAVE BEEN SUSTAINED, THE CONTRACTOR AGREES THAT IT WILL HOLD THE INDEMNITEES HARMLESS AGAINST ANY SUCH VIOLATION, FINE, CLAIM OR SUIT, AND THAT IT WILL REIMBURSE THE INDEMNITEES THE COST OF DEFENDING SUCH SUIT,**

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AND IF ANY JUDGMENT AGAINST THE INDEMNITEES ARISES THEREFROM, THE CONTRACTOR SHALL PAY OR SATISFY IT AND SHALL PAY ALL COSTS INCURRED BY THE INDEMNITEES.

d. Communications

The Owner and Contractor shall include the Design Professional in all communications about the Design Professional's services or professional responsibilities. The Owner shall promptly notify the Design Professional of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Design Professional's consultants shall be through the Design Professional. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

i. Failure of Contractor to give the Owner or Design Professional written notice of Contractor's objections, within three (3) business days, to directives, instructions, interpretations, or minutes from the Owner or Design Professional, shall constitute final and conclusive consent on the part of the Contractor to such directives, instructions, interpretations, or minutes of the Owner or Design Professional.

ii. Any written notice from the Owner or Design Professional to the Contractor shall be sufficiently given when delivered to the last known business address of the Contractor, or to its registered or authorized agent, representative, or officer. Any written notice from the Contractor to the Owner shall be sufficiently given when personally delivered to the Owner's Office, Attn: Project Manager, or at such other address and to the attention of such person as the Owner may from time to time designate in writing.

e. Based on the Design Professional's evaluations of the Contractor's Applications for Payment, the Design Professional will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

f. The Design Professional has authority to reject Work that does not conform to the Contract Documents. Whenever the Design Professional considers it necessary or advisable, the Design Professional will have the authority to require inspection or testing of the Work in accordance with Sections 13.4.b and 13.4.c, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Design Professional nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Design Professional to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.

g. The Design Professional will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Design Professional's action will be taken in accordance with the submittal schedule approved by the Design Professional or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Design Professional's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor

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as required by the Contract Documents. The Design Professional's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 1.2, 3.2.a, 3.3, 3.5, 3.12, and 13.9. The Design Professional's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Design Professional's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

h. The Design Professional will prepare Change Orders and Construction Change Directives and may order minor changes in the Work as provided in Section 7.4. The Design Professional will investigate and make recommendations regarding concealed and unknown conditions as provided in Section 3.7.d.

i. The Design Professional will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

j. If the Owner and Design Professional agree, the Design Professional will provide one or more Project representatives to assist in carrying out the Design Professional's responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

k. The Design Professional will interpret matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Design Professional's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

l. Interpretations of the Design Professional will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations, the Design Professional will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

m. The Design Professional's opinions on matters relating to aesthetic effect will be considered by the Owner when making the Owner's determination on these issues and the Owner's decision will be final if consistent with the intent expressed in the Contract Documents. Such Owner's determination shall be communicated through the Design Professional.

n. The Design Professional will review and respond to requests for information about the Contract Documents. The Design Professional's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Design Professional will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

Article 5. SUBCONTRACTORS

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Section 5.1 Definitions

a. A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.
b. A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

Section 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

a. Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Design Professional of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Design Professional may notify the Contractor whether the Owner or the Design Professional (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Design Professional to provide notice within the 14-day period shall constitute notice of no reasonable objection.
b. The Contractor shall not contract with a proposed person or entity to whom the Owner or Design Professional has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.
c. If the Owner or Design Professional has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Design Professional has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.
d. The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Design Professional makes reasonable objection to such substitution.
e. Upon request, the Contractor shall provide to the Owner an executed copy of all subcontracts, purchase orders, and other agreements relating to the Work.
f. The Contractor shall not sublet the Work as a whole. The approval of subcontractors in no way relieves the Contractor from full responsibility.

Section 5.3 Subcontractual Relations

a. By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including responsibility for safety of the Subcontractor's Work, which the Contractor, by the Contract Documents, assumes toward the Owner , the Owner's other consultants and Design

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Professional. Each subcontract agreement shall preserve and protect the rights of the Owner , the Owner's other consultants, and Design Professional under the Contract Documents with respect to the Work to be performed by the Subcontractor. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available for review for each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors. Notwithstanding the above, all Agreements with the Owner shall have all references to compensation redacted before disclosing to Subcontractors, sub-Subcontractors, or any other tier of vendor.

b. All subcontracts shall be in writing in form and substance substantially similar to the Contractor's standard form subcontract, attached to the Agreement and made a part thereof as an Exhibit, and shall specifically provide that the Owner is an intended third-party beneficiary of such subcontract. The Contractor's subcontractors, however, are not intended third-party beneficiaries of this Agreement by pass through, assignment, or otherwise, except as provided in the Contract Documents, and the Owner shall not be bound to Contractor's subcontract agreements.

c. Whenever the Contractor receives payment pursuant to the Contract Documents, the Contractor shall make payments to each of its Subcontractors of any amounts actually received which were included in the Contractor's Application for Payment to the Owner for such subcontracts unless otherwise allowed to withhold payment by the terms and conditions of the subcontract or as allowed by law. The Contractor shall make such payments within ten (10) days of receipt of payment from the Owner in the same manner as the Owner is required to pay the Contractor under the Contract Documents if the Subcontractor is satisfactorily performing under its contract with the Contractor. Such payments from Owner to Contractor shall be imposed with an express trust to assure that payment is made to all Project Subcontractors, Sub-subcontractors, and suppliers. In addition to the express trust imposed upon such funds and the fiduciary duties incumbent upon the Contractor, Texas Property Code Chapter 162 shall apply.

d. The Contractor shall monitor the Subcontractors, who shall pay all suppliers, Sub-subcontractors, laborers, and any other persons who provide goods, materials, labor, or equipment to the Subcontractor any amounts actually received which were included in the Subcontractor's request for payment to the Contractor for such persons, within ten (10) days of receipt of payment from the Contractor. The construction payments made by the Contractor to the Subcontractor shall be trust funds as set forth in Chapter 162 of the Texas Property Code. If the Subcontractor fails to make such payments in the required manner, the Subcontractor shall pay said suppliers, Sub-subcontractors, and laborers interest as set forth in Chapter 162 of the Texas Property Code.

e. At the time the Subcontractor submits a request for payment to the Contractor, the Subcontractor shall also submit to the Contractor a list of the Subcontractor's suppliers, Sub-subcontractors, and laborers. The Contractor shall be relieved of the requirements of this Section regarding payment in ten (10) days and interest payments until the Subcontractor submits such list. If the Contractor fails to make timely payments to the Subcontractor as required by this Section, the Contractor shall pay the Subcontractor interest as calculated under the provisions of Chapter 2251 of the

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Texas Government Code. Nothing in this Section 5.3 shall be construed to affect the retention provisions of any contract.

f. The provisions of this Section 5.3 shall be made a part of each contract between the Contractor and each Subcontractor, either expressly or by incorporation by reference to this Section of the Contract Documents.

Section 5.4 Contingent Assignment of Subcontracts

a. Each subcontract agreement for a portion of the Work may be assigned by the Contractor to the Owner, provided that

.1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and

.2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

b. If the Work in connection with a subcontract has been suspended for more than thirty (30) days, after termination of the Contract by the Owner pursuant to Section 14.2 and the Owner accepts assignment of such subcontract, the Subcontractor's compensation shall be equitably adjusted for any increase in direct verifiable costs incurred by such Subcontractor as a result of the suspension.

c. Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity, including the performance bond Surety's takeover or completion contractor, which shall relieve the Owner of any legal responsibility under the subcontract.

d. Each subcontract shall specifically provide that the Owner shall only be responsible to the Subcontractor for those obligations that accrue subsequent to the assignment of the Subcontractor to the Owner after suspension and termination of the Contract, as provided in this Section 5.4. This Section 5.4 shall be construed to prohibit a pass through or assignment of rights, unless authorized by the Owner in writing

Section 5.5 Owner Payments to Subcontractors

a. In the event of any default hereunder by the Contractor, or in the event the Owner or Design Professional fails to approve any Application for Payment that is not the fault of a Subcontractor, the Owner may make direct payment to the Subcontractor, less appropriate retainage. In that event, the amount paid the Subcontractor shall be deducted from the payment to the Contractor.

b. Nothing contained herein shall create any obligation on the part of the Owner to make any payments to any Subcontractor, and no payment by the Owner to any Subcontractor shall create any obligation to make any further payments to any Subcontractor.

Article 6. CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

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Section 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

a. The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided in Article 15.
b. When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.
c. The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.
d. Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.
e. The Contractor accepts assignment of, and liability for, all purchase orders and other agreements for procurement of materials and equipment that are listed in and identified as part of the Contract Documents. The Contractor shall be responsible for such pre-purchased items, if any, as if the Contractor were the original purchaser. The Contract Sum includes, without limitation, all costs and expenses in connection with delivery, storage, insurance, installation, and testing of items covered in any assigned purchase orders or agreements. All warranty and correction of the Work obligations under the Contract Documents shall also apply to any pre-purchased items, unless the Contract Documents specifically provide otherwise.

Section 6.2 Mutual Responsibility

a. The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.
b. If part of the Contractor's Work depends on proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Design Professional of any apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Design Professional of these apparent discrepancies or defects prior to

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proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work.

c. The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

d. The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.e.

e. The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

f. Should the Contractor wrongfully delay or cause damage to the work or property of any Separate Contractor, the Contractor shall, upon due notice, promptly attempt to settle with such other contractor by agreement or otherwise to resolve the dispute. If such Separate Contractor sues or initiates a judicial proceeding against the Owner on account of any delay or damage alleged to have been caused by the Contractor, the Owner shall notify the Contractor who shall defend such proceedings at the Contractor's expense. The Owner may fund the defense of such proceedings contemplated by this Section but, in any event, if any judgment or award against the Owner arises therefrom, the Contractor shall pay to satisfy it to the extent of Contractor's responsibility.

g. **SHOULD ANY SUCH SEPARATE CONTRACTOR WRONGFULLY DELAYED OR DAMAGED BY THE CONTRACTOR OR PERSONS FOR WHOM THE CONTRACTOR IS RESPONSIBLE PER SECTION 6.2.f MAKE A CLAIM AGAINST THE INDEMNITEES, OR BRING ANY ACTION AGAINST THE INDEMNITEES, ON ACCOUNT OF THE DAMAGE ALLEGED TO HAVE BEEN SO SUSTAINED, THE CONTRACTOR SHALL HOLD THE INDEMNITEES HARMLESS AND DEFEND THEM AGAINST ANY SUCH CLAIM OR SUIT, AND SHALL REIMBURSE TO THE INDEMNITEES THE COST INCLUDING, WITHOUT LIMITATION, REASONABLE, ADDITIONAL ATTORNEY'S FEES INCURRED DEFENDING SUCH SUIT, AND IF ANY JUDGMENT AGAINST THE INDEMNITEES ARISES THERE FROM, THE CONTRACTOR SHALL PAY OR SATISFY IT AND SHALL PAY ALL COSTS INCURRED BY THE INDEMNITEES.**

h. Should the Contractor be caused damage by any Owner's Separate Contractor(s)'s work, by reason of such Owner's Separate Contractor's failure to perform properly under its contract with the Owner, no action will lie against the Owner, and the Owner shall have no liability therefor, but the Contractor may assert its claims for damages directly against such Owner's Separate Contractor and the Owner shall reasonably assist the Contractor. by assign such rights to Contractor, unless otherwise prohibited under Texas law.

i. Inasmuch as the completion of the building within the prescribed time is dependent very largely upon the close and active cooperation of all those engaged therein, it is, therefore expressly understood and agreed that each contractor shall lay out and install its work at such time(s) and in such manner as to not delay or interfere with the carrying forward of the work of the other contractors.

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j. Where the work of one contractor directly affects the conditions of the work of another contractor including, as examples only, and not limited to, providing shoring for backfilling, providing protective covering for painting, providing adequate bracing of door jambs, etc., the contractor performing the work which will adversely affect another contractor's work shall be responsible for providing adequate protection based upon methods used to perform its work.

Section 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, or the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Design Professional will allocate the cost among those responsible, which allocation shall be final.

Article 7. CHANGES IN THE WORK

Section 7.1 General

a. Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

b. A Change Order shall be based upon agreement among the Owner, Contractor, and Design Professional. A Construction Change Directive requires agreement by the Owner and Design Professional and may or may not be agreed to by the Contractor. An order for a minor change in the Work not involving an adjustment in the Contract Sum or an extension of the Contract Time and reasonably inferable from the intent of the Contract Documents may be issued by the Design Professional alone.

c. Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work. Except as permitted in Section 7.3 or as otherwise provided herein, a change in the Contract Sum or the Contract Time shall be accomplished only by Change Order. Accordingly, no course of conduct or dealings between the parties, nor express or implied acceptance of alterations or additions to the Work, and no claim that Owner has been unjustly enriched by any alteration of or addition to the Work, whether or not there is, in fact, any unjust enrichment to the Work, shall be the basis of any claim to an increase in any amounts due under the Contract Documents or a change in any time period provided for in the Contract Documents.

Section 7.2 Change Orders

a. A Change Order is a written instrument prepared by the Design Professional and signed by the Owner, Contractor, and Design Professional stating their agreement upon all of the following:

.1 The change in the Work;

.2 The amount of the adjustment, if any, in the Contract Sum; and

.3 The extent of the adjustment, if any, in the Contract Time.

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b. Methods used in determining adjustments to the Contract Sum may include those listed in Sections 7.3.c, 7.3.g and 7.3.j.

c. Agreement on any Change Order constitutes a final settlement of all past and future claims, at law or in equity, concerning all matters relating to the change in the Work that is the subject of the Change Order, including, but not limited to, delays, all direct and indirect costs, any claim for damages associated with such change, and any and all adjustments to the Contract Sum and the construction schedule.

d. Change Orders Requiring City Council Approval
The Contract Sum may not be increased because of a Change Order unless additional money for increased costs is appropriated for that purpose from available funds or is provided for by the authorization of the issuance of time warrants. The approval of the Denton City Council is required if a Change Order involves a decrease or an increase of $50,000.01 or more. The original Contract Sum also may not be increased under this Section 7.2 by more than twenty-five percent (25.0%) over the entire duration of the Project. The original Contract Sum may not be increased by more than twenty-five percent (25%) over the entire duration of the Project for any reason; nor may it be decreased by more than twenty-five percent (25%) without the consent of the Contractor, as provided in Texas Local Government Code Sec. 252.048. After the Change Order is submitted by the Contractor under this Section 7.2, the additional time required to obtain City Council approval shall not be factored into any past or future claim for delays or calculated as a part of the Change Order request.

Section 7.3 Construction Change Directives

a. A Construction Change Directive is a written order prepared by the Design Professional and signed by the Owner and Design Professional, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

b. A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

c. If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

.1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;

.2 Unit prices stated in the Contract Documents or subsequently agreed upon;

.3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed fee; or

.4 As provided in Section 7.3.d.

d. If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Design Professional shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit calculated using the sum of the actual costs allowed in Sections 7.3.d.1 through 7.3.d.5, and using the percentages as

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set forth in Section 7.3.1 below. In such case, and also under Section 7.3.c, the Contractor shall keep and present, in such form as the Design Professional may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.d shall be limited to the following:

.1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Design Professional;

.2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;

.3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;

.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and

.5 Additional, verifiable payroll and subsistence costs incurred by the Contractor, Subcontractor, and Sub-subcontractor of field personnel directly attributable to the change.

e. If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

f. Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Design Professional of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

g. A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

h. The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Design Professional. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

i. Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Design Professional will make an interim recommendation for purposes of monthly certification for payment for those costs and certify for payment the amount that the Design Professional recommends, in the Design Professional's professional judgment, to be reasonably justified. The Design Professional's interim recommendation of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

j. When the Owner and Contractor agree with a recommendation made by the Design Professional concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Design Professional will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

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k. If the Owner and Contractor do not agree with the adjustment in Contract Time or the method for determining it, the adjustment or the method shall be referred to the Design Professional for determination. The Design Professional may consult with the Owner in connection with such determination either at the direction of the Owner or at the Design Professional's discretion. If the Contractor does not ultimately agree with the Design Professional's determination, the Contractor may assert a Claim in accordance with Article 15.

l. In Subparagraph 7.3.d, the allowance for the combined total of onsite and offsite overhead and profit included in the total cost to the Owner shall be based on the following schedule:

.1 For the Contractor, for Work performed by the Contractor's own forces, fee percentage of the Cost of Work stated in Section 5.1.a of the Stipulated Sum Agreement plus actual direct jobsite costs associated with the additional work, if any;

.2 For the Contractor, for Work performed by the Contractor's Subcontractor, fee percentage of the Cost of Work stated in the Stipulated Sum Agreement, if any, plus actual direct jobsite costs associated with the additional work, if any;

.3 For each Subcontractor or Sub-subcontractor involved, for Work performed by that Subcontractor or Sub-subcontractor's own forces, ten percent (10%) of the cost;

.4 For each Subcontractor, for Work performed by the Subcontractor's Sub-subcontractors, five percent (5%) of the amount due the Sub-subcontractor;

.5 Cost to which overhead and profit is to be applied shall be determined in accordance with Section 7.3.d;

.6 Under no circumstance shall costs of the Contractor's supervisory, management, administrative or other office personnel, regardless of where stationed, be paid as cost of the Work under 7.3.d Conversely, the Contractor shall be compensated for their labor within the overhead and profit percentage specified in this Section 7.3.l;

.7 In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can immediately be seen by inspection, shall be accomplished by a complete itemization of costs including labor, materials, and subcontracts. Labor and materials shall be itemized in the manner prescribed above. Where major cost items are subcontracts, they shall be itemized also;

.8 When both additions and credits are involved in any change, the allowance for overhead and profit shall be figured on the basis of the net increase or decrease, if any; and

.9 Overtime, when specifically authorized by the Owner and not as a requirement for the Contractor to fulfill its obligations under this Agreement, shall be paid for by the Owner on the basis of premium payment only, plus the cost of insurance and taxes based on the premium payment period. Overhead and profit will not be paid by the Owner for overtime.

Section 7.4 Minor Changes in the Work

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The Design Professional may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Design Professional's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Design Professional and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Design Professional's order for a minor change without prior notice to the Design Professional that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

Section 7.5 Supporting Information

Notwithstanding the above, requests for an adjustment in the Contract Sum or adjustment in the Contract Time shall be in a form and accompanied by supporting information with a level of detail wholly acceptable to the Owner and Design Professional. The Contractor shall also comply with all provisions of Articles 8 and 15 with respect to claims. The required information shall be provided by the Contractor in less than twenty-one (21) days from the Contractor's request for an adjustment in the Contract Sum or Contract Time. Failure to timely provide this information in the proper form may be, in and of itself, grounds for rejection of the request, at the sole discretion of the Owner or Design Professional.

Article 8. TIME

Section 8.1 Definitions

a. Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.
b. The date of commencement of the Work is the date established in the Agreement. The date shall not be postponed by the failure to act of the Contractor or of persons or entities for whom the Contractor is responsible.
c. The date of Substantial Completion is the date certified by the Design Professional in accordance with Section 9.8.
d. The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

Section 8.2 Progress and Completion

a. Time limits stated in the Contract Documents are of the essence. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.
b. The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance. Unless the date of commencement is established by a Notice to Proceed given by the Owner, the Contractor shall notify the Owner in writing not less than five (5) days or other agreed period before commencing the Work to permit the timely filing of any additional necessary documents.
c. Attention is directed to the fact that the Work is urgently needed by the Owner; for this reason it shall be agreed that the Contractor will substantially complete all Work under the Contract within the time established in the Contract Documents and the most recently approved Contractor's

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Project Schedule. The Contractor shall begin the Work on the date of commencement as defined in the Contract Documents; carry the Work forward with adequate resources; furnish, without limitation such labor, supervision, materials, facilities, and equipment; and work such hours, including night shifts, overtime operations, and Sundays and/or holidays, as may be necessary to ensure the progress and completion of both the Work and the Project as reflected by the most recently approved Contractor's Project Schedule.

d. The Contractor shall achieve specific Contractual Milestone dates (if any), Substantial Completion, and Final Completion within the times stated in the Contract Documents, and such dates shall be adhered to and shall be the last acceptable dates for completion of Work required for those milestones and completions, unless and until modified by the Owner in writing.
e. The Contractor understands and agrees that all Work must be performed in an orderly and closely coordinated sequence so that the dates for Contractual Milestones (if any), Substantial Completion, and Final Completion, may be met by the both the Contractor as well as the respective Separate Contractors.
f. The Contractor shall also complete the Work in all of its details for final acceptance as expeditiously as possible after Substantial Completion.
g. The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

Section 8.3 Delays and Extensions of Time

a. If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Design Professional, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, implementation of Federal law or policies, unusual delay in transportation, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.f.ii, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation; or (5) by other causes that the Design Professional recommends may, justify delay, then the Contract Time may be extended for such reasonable time as the Owner may determine.
b. Claims relating to time shall be made in accordance with applicable provisions of Article 15.
c. This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.
d. Any claims for extension of time shall be made in writing to the Owner and Design Professional not more than ten (10) days after commencement of the delay; otherwise it shall be waived. In the case of a continuing delay only one claim is necessary. The Contractor shall provide an estimate of the probable effect of such delay on the progress of work within five (5) days of the first date the Contractor should reasonably be expected to have calculated the impact of such delay, but in no event more than fifteen (15) days after the commencement of the delay, with weekly updates to the impact if the delay is of an ongoing nature.
e. Extensions of the Contract Time will be made for delays due to weather conditions only when such conditions are more severe and extended than those reflected by the ten (10) year average for the month as evidenced by the National Climatic Data Center's (NCDC's) Surface Data US at http://gis.ncdc.noaa.gov/ website/ims-cdo/sod/viewer.htm or other data as mutually agreed by the Owner and Contractor for the Project area.

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f. In allowing delays for weather, the Owner will be entitled to consider weather conditions prevailing throughout the entire Contract period. The Owner and Contractor will together reconcile actual working days lost and gained over the entire Contract period every ninety (90) days. The Contractor shall then adjust the schedule activities accordingly for both the Contractor's weather float reserves and Owner's float reserves where those activities are carried in the Contractor's Project Schedule (if any).Extensions of time due to weather or other allowable reasons will be granted on the basis of one-and-four-tenths (1.4) calendar days credit for every working day lost, with each separate extension figured to the nearest whole calendar day.

g. The extension of the contract completion time for weather conditions will occur only in the event that the weather in question affected critical activities on the most current Contractor's Construction Schedule, and at least one half of the work force allocated to that item of work was also adversely affected by the same weather conditions.

Section 8.4 Contractor's Obligations After Delay

a. If either the Work actually in place falls behind as reflected by the currently updated Master Project Schedule or Contractor's Construction Schedule, or it becomes apparent or likely in the reasonable opinion of the Owner after consultation with the Design Professional that the Work will not be completed within the Contract Time or in accordance with the Contractor's Construction Schedule, due to delays caused by the Contractor or its subcontractors, the Contractor agrees it shall, as necessary, take some or all of the following actions (hereinafter referred to collectively as "Extraordinary Measures") at no additional cost to the Owner or Design Professional, as required to substantially eliminate, in the judgment of the Owner, the backlog of Contractor's Work on the Project:

.1 Increase quantities of, without limitation, labor, supervision, material deliveries, equipment on site, and crafts as necessary;

.2 Increase the number of working hours per shift, shifts per working day, working days per week, or any combination of the foregoing;

.3 Reschedule activities to achieve maximum practical concurrence of accomplishment; and

.4 Do whatever else is reasonably required by the Owner or Design Professional.

b. These Extraordinary Measures shall continue until the progress of the Work complies with the stage of completion required by the Contract Documents. The Owner's right to require Extraordinary Measures is solely for the purpose of ensuring the Contractor's compliance with the Contractor's Construction Schedule.

c. In the event of a delay, the Owner Design Professional may also require the Contractor to immediately submit a Proposed Recovery Schedule as specified in Section 3.10.h above. If the Proposed Recovery Schedule is not satisfactory, the Design Professional may unilaterally establish a new Proposed Recovery Schedule acceptable to the Owner; issue it as a Construction Change Directive; and the Contractor shall comply therewith. The Owner may also require the Contractor to take any of the Extraordinary Measures to make up the lag in scheduled progress, all without additional cost to the Owner, or Design Professional.

d. Failure of the Contractor to substantially comply with the requirements of this Section 8.4 shall be considered grounds for a determination by the Owner, after consultation with the Design

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Professional, that the Contactor is in breach of this Agreement by failing to prosecute the Work and that of the Project so as to ensure its completion within both the Contract Time and the updated Contractor's Construction Schedule.

e. Likewise, in the event the progress of the Project falls behind the predictions of the Master Project Schedule through no fault of the Contractor, the Owner or Design Professional may request, and the Contractor may agree to take one or more of the Extraordinary Measures, with the Owner bearing the cost for such measures by Change Order.

f. The Contractor shall not be entitled to an adjustment in the Contract Sum in connection with Extraordinary Measures required by the Owner under or pursuant to this Section 8.4, except as specifically noted otherwise in Section 8.4.e.

Section 8.5 Owner's Rights After Delay

a. In the event that any Contractor fails, or appears likely to fail, to complete a critical portion of Work on time or to complete a Contractual Milestone Date or completion date as evidenced by the most recently approved Contractor's Project Schedule, the Owner or the Design Professional shall have the right to impose any or all of the following options:

.1 Require the Contractor to substantiate the capability to get back on schedule within ten (10) business days;

.2 Require the Contractor to take some or all of the Extraordinary Measures, and do whatever else is required by the Owner or Design Professional until Contractor confirms, to the satisfaction of the Owner and Design Professional, the progress of the Work is in compliance and congruence with the most recently approved Contractor's Construction Schedule, such measures being at no extra cost to Owner and Design Professional;

.3 Withhold progress payment, or portions thereof, until such time as the Contractor is in compliance with the most recently approved Contractor's Project Schedule; and

.4 Contact or visit the factory, plant or distribution center whose production or delivery schedule may be critical to the scheduled completion of a portion of the contract work, and expedite same, at Contractor's expense.

Section 8.6 Liquidated Damages

a. Should the Contractor fail to substantially complete the Work on, or before, the original date set forth in the Contract, or on or before the revised date as granted by extensions to Contract Time, the Owner may at its sole discretion permit the Contractor to proceed, and in such case, there shall be deducted from any monies due or which may become due the Contractor, a sum as specified herein, for each and every calendar day that the Work shall remain uncompleted. This sum shall be considered, not as penalty, but as the cost(s) for substantial losses suffered by the public and the Owner. Liquidated damages are intended to compensate the Owner for the Contractor's failure to meet the deadlines set forth herein, and shall not excuse the Contractor from liability from any other breach of requirements of the Contract Documents, including any failure of the Work to conform to applicable requirements. The Contractor agrees that the sums in Section 8.6.b are reasonable in light of the anticipated or actual harm caused by the breach, the difficulties of the proof of loss, and the inconvenience or nonfeasibility of otherwise obtaining an

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adequate remedy. Contractor further acknowledges and agrees that Liquidated Damages may be owing even though no termination has occurred.

b. Contractor shall pay as liquidated damages to the Owner: the sums shown in the table below for each calendar day that expires after the date set forth in the Contract for Final Completion of the Work.

First Week Late	Second Week Late	Third & Fourth Weeks Late	Every Day After the Fourth Week Late
$1000/day	$1000/day	$1000/day	$1500/day

c. The parties acknowledge, covenant, and agree that the daily basis and the amount set forth above for liquidated damages are reasonable because of the unique nature of the Project as a benefit to the public; the fact that inconvenience to the public will be one of the significant impacts of any failure by the Contractor to timely complete the Work; and that it is impracticable and extremely difficult to ascertain and determine the actual losses which would accrue to the Owner and the public.

d. Permitting the Contractor to continue and finish the Work, or any portion thereof, after the time fixed for its completion, shall in no way operate as a waiver on the part of the Owner of any of its rights under the Contract. The Contractor acknowledges the Owner receives no benefits from early completion of the Project or the Work, therefore all rights, if any, to an early completion bonus or other increases in the Contract Sum for such early completion are hereby waived by the Contractor.

Article 9. PAYMENTS AND COMPLETION

Section 9.1 Contract Sum

a. The Contract Sum is stated in the Agreement and, is the maximum amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents. The Contract Sum may only be increased pursuant to a Change Order signed by the Owner. Completion of the Work is a condition precedent to Owner's obligation to pay the full Contract Sum.

b. If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

Section 9.2 Schedule of Values

Where the Contract is based on a Stipulated Sum or the Cost of the Work, the Contractor shall meet with the Design Professional, at the Preconstruction Conference with a proposed Schedule of Values as specified in Section 3.10. The Contractor's Schedule of Values will be reviewed by the Owner and Design Professional in the context of the Contractor's proposed Construction Management Plan, including, but not limited to, the Contractor's Construction Schedule therein. The values assigned to each work activity in the Schedule of Values should be generated by the projected earned value of the activities in the Contractor's Construction Schedule, rounded to the nearest five dollars, and equal in aggregate to

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the Contractor's and Subcontractor's contract amount(s). The Schedule of Values shall allocate the entire Contract Sum to the various portions of the Work and be prepared in such form and supported by such additional data to substantiate its accuracy as the Owner and Design Professional may require. This Schedule, of Values, unless objected to by the Owner or Design Professional, shall be used as a basis for reviewing the Contractor's Applications for Payment.

Section 9.3 Applications for Payment

a. At least ten days before the date established for each progress payment, the Contractor shall submit to the Design Professional an itemized Application for Payment prepared in accordance with the Schedule of Values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Design Professional require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers and shall reflect retainage if provided for in the Contract Documents. The Application for Payment shall be notarized and include other documentation as reasonably required by the Owner; submitted electronically.

   i. As provided in Section 7.3.i, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim recommendations of the Design Professional, but not yet included in Change Orders.

   ii. Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

   iii. Each Application for Payment shall be accompanied by the following, all in form and substance satisfactory to the Owner and Design Professional and in compliance with all applicable statutes:

      .1 A duly executed and acknowledged sworn statement showing all Subcontractors and material suppliers with whom the Contractor has entered into subcontracts, the amount of each such subcontract, the invoice from and the amount requested for any Subcontractor and material supplier in the requested Application for Payment, and the amount to be paid to the Contractor from such progress payment, together with similar sworn statements from all such Subcontractors and material suppliers;

      .2 Duly executed statutory conditional waivers of mechanics' and material suppliers' lien for progress payments with teach payment application; and appropriate statutory unconditional waivers of mechanics' and material suppliers' liens for progress payments; and appropriate statutory unconditional waivers for final payments from all Subcontractors and, when appropriate, from material suppliers and lower tier Sub-subcontractors establishing payment or satisfaction of payment of all amounts requested by the Contractor on behalf of such entities or persons in any previous Application for Payment;

      .3 An updated Contractor's Construction Schedule per Section 3.10 clearly showing the actual progress of the Work for each activity against the Work

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previously scheduled to be completed during the period, and against targeted activities' previously approved completion dates; and

.4 With every Payment Request for the Work, contractor will submit an affidavit stating that the contractor has complied with the requirements of Chapter 2258, Texas Government Code. The parties hereto agree that any electronic copy of such affidavit shall be treated as an original for all intents and purposes;

.4 If required by the Owner's title insurer, if any, the Contractor shall execute a personal gap undertaking in form and substance satisfactory to such title insurer; and.

.5 Notwithstanding the above, Applications for Payment shall be in a form and accompanied by supporting information with a level of detail wholly acceptable to the Design Professional, and shall include, at a minimum, an updated monthly Contractor's Construction Schedule clearly and graphically comparing the actual "work-in-place" completed to the Work previously projected to be complete for the period. Failure to provide this information in the proper form may be, in and of itself, grounds for rejection of the Application for Payment, at the discretion of the Design Professional.

b. Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the stored materials and equipment which must be properly tagged as to material and job identification; must be available for inspection by the Design Professional; and such requests for payment must be accompanied by documentary evidence as specified, without limitation, in Sections 3.13 and 11.3, which supports the request's validity; quantity and value of materials; proper material acceptance and storage; and including insurance on the materials as evidenced by a Certificate of Insurance or otherwise protects the Owner's interests. Such request shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site. Such materials shall be:

.1 Protected from diversion, destruction, theft, and damage to the satisfaction of the Owner, and the Lender;

.2 Specifically marked for use on the Project; and

.3 Segregated from other materials at the storage facility.

c. The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner either by incorporation in the construction or upon the receipt of payment by the Contractor, whichever occurs. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

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d. **THE CONTRACTOR FURTHER EXPRESSLY UNDERTAKES TO DEFEND THE INDEMNITEES, AT THE CONTRACTOR'S SOLE EXPENSE, AGAINST ANY ACTIONS, LAWSUITS, OR PROCEEDINGS BROUGHT AGAINST THE INDEMNITEES AS A RESULT OF LIENS OR VERIFIED CLAIMS FILED AGAINST THE WORK, THE SITE OF ANY OF THE WORK, THE PROJECT SITE AND ANY IMPROVEMENTS THEREON, PAYMENTS DUE THE CONTRACTOR, THE PROJECT BOND OR ANY PORTION OF THE PROPERTY OF ANY OF THE INDEMNITEES (REFERRED TO COLLECTIVELY AS "LIENS OR VERIFIED CLAIMS" IN THIS SECTION 9.3.d). THE CONTRACTOR HEREBY AGREES TO INDEMNIFY AND HOLD THE INDEMNITEES HARMLESS AGAINST ANY SUCH LIENS OR VERIFIED CLAIMS AND AGREES TO PAY ANY JUDGMENT OR LIENS OR VERIFIED CLAIMS RESULTING FROM ANY SUCH ACTIONS, LAWSUITS, OR PROCEEDINGS.**

Section 9.4 Certificates for Payment

a. The Design Professional will, within seven (7) days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Design Professional recommends is properly due, and notify the Contractor and Owner of the Design Professional's reasons for withholding certification in part as provided in Section 9.5.a; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Design Professional's reason for withholding certification in whole as provided in Section 9.5.a.

b. The issuance of a Certificate for Payment will constitute a representation by the Design Professional to the Owner, based on the Design Professional's evaluation of the Work and the data in the Application for Payment, that, to the best of the Design Professional's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Design Professional. However, the issuance of a Certificate for Payment will not be a representation that the Design Professional has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

c. Certification will be issued for ninety-five percent (95%) of the amount requested by the Contractor and approved by the Design Professional to be properly due until the Contractor is ninety-five percent (95%) completed with the Work. Thereafter, the accumulated retainage may be held without additional retainage, except that, should the Contractor at any time fail to keep current with the approved progress schedule, fail to assure payment to Subcontractors, Sub-

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subcontractors and suppliers as required hereunder; or fail to promptly and diligently correct Work that does not comply with the Contract Documents, certification of ninety-five percent (95%) shall automatically again become effective and shall apply as long as the Contractor lags behind such progress or fails to assure such payment.

Section 9.5 Decisions to Withhold Certification

a. The Design Professional may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Design Professional's opinion the representations to the Owner required by Section 9.4.b cannot be made. If the Design Professional is unable to certify payment in the amount of the Application, the Design Professional will notify the Contractor and Owner as provided in Section 9.4.a. If the Contractor and Design Professional cannot agree on a revised amount, the Design Professional will promptly issue a Certificate for Payment for the amount for which the Design Professional is able to make such representations to the Owner. The Design Professional may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Design Professional's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.b, because of any of the following:

   .1 defective Work not remedied;

   .2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;

   .3 failure of the Contractor to make payments properly to Subcontractors, Sub-subcontractors and suppliers or for labor, materials or equipment;

   .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;

   .5 damage to the Owner or a Separate Contractor;

   .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;

   .7 repeated failure to carry out the Work in accordance with the Contract Documents;

   .8 Contractor's failure to obtain necessary permits or licenses or to comply with applicable codes, regulations, or other laws;

   .9 failure to fully execute the Contract with all associated documents as required;

   .10 bond claims, or liens, filed for any portion of the Work; or

   .11 failure of the Contractor to comply with any provisions of the Contract Documents, including without limitation Section 8.4.

b. Omitted

c. When the reasons for withholding certification are removed, certification will be made for amounts previously withheld less all associated damages, costs and expenses, suffered or accrued by the Owner or Design Professional. In the event the Design Professional nullifies a previously

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issued Project Certificate for Payment, and the Owner has, prior to such nullification, paid thereon, the Contractor shall promptly reimburse to the Owner amounts the latter had previously paid pursuant to the nullified project Certificate for Payment. Alternately, the Owner may withhold payment in any subsequent Application for Payment, until and unless the reasons for nullification of the previously issued project Certificate for Payment have been remedied and all associated damages, costs, and expenses of Owner and Design Professional have been paid by the Contractor.

d. If the Design Professional withholds certification for payment under Section 9.5.a.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Design Professional and the Contractor shall reflect such payment on its next Application for Payment.
e. The Contractor shall not stop work or terminate the Contract if the Design Professional should refuse to issue any certificate because the Application for Payment does not conform with the requirements of Sections 9.3, 9.4, 9.5 or any other portion of these General Conditions, as supplemented herein.

Section 9.6 Progress Payments

a. After the Design Professional has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Design Professional.
b. The Contractor shall pay each Subcontractor, Sub-subcontractor and supplier, no later than ten (10) days after receipt of payment from the Owner the amount to which the Subcontractor, Sub-subcontractor and supplier is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's, Sub-subcontractor's and supplier's portion of the Work, unless otherwise allowed by the provisions of the subcontract or by law. The Contractor shall notify Owner in advance and in writing of any payment(s) to be withheld from any Subcontractor. The Contractor shall, by appropriate agreement with each Subcontractor, Sub-subcontractor and supplier, require each to make payments to their Sub-subcontractors and suppliers in a similar manner.
c. The Design Professional will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Design Professional and Owner on account of portions of the Work done by such Subcontractor.
d. The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven (7) days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Design Professional shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.
e. The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.b, 9.6.c and 9.6.d.

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f. A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of any Work.

g. The Contractor shall not withhold from any Subcontractor sums due the Subcontractor for completed Work which has been paid for by the Owner unless allowed by the terms and conditions of the subcontract as stated in Section 5.3.C of the Agreement or by law. The Contractor shall notify Owner in advance and in writing of any payment(s) to be withheld from any Subcontractor. Sums withheld by the Owner from the Contractor for deficiencies solely attributable to the Contractor shall not be grounds for the Contractor to withhold sums due to any Subcontractor. All sums paid to the Contractor for labor, materials, or equipment for the Work or Project shall be considered trust funds to be used by the Contractor for payment to those persons to the extent providing labor, materials and/or equipment incorporated into the Work or Project. Payments received by the Contractor for Work properly performed by Subcontractors and suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. However, notwithstanding the above, nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

h. **PROVIDED THE OWNER HAS FULFILLED ITS PAYMENT OBLIGATIONS UNDER THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL DEFEND AND INDEMNIFY THE OWNER FROM ALL LOSS, LIABILITY, DAMAGE OR EXPENSE, INCLUDING REASONABLE ATTORNEY'S FEES AND LITIGATION EXPENSES, ARISING OUT OF ANY LIEN CLAIM OR OTHER CLAIM FOR PAYMENT BY ANY SUBCONTRACTOR OR SUPPLIER OF ANY TIER. UPON RECEIPT OF NOTICE OF A LIEN CLAIM OR OTHER CLAIM FOR PAYMENT, THE OWNER SHALL NOTIFY THE CONTRACTOR. IF APPROVED BY THE APPLICABLE COURT, WHEN REQUIRED, THE CONTRACTOR MAY SUBSTITUTE A SURETY BOND FOR THE PROPERTY AGAINST WHICH THE LIEN OR OTHER CLAIM FOR PAYMENT HAS BEEN ASSERTED.**

i. To the extent Contractor has received payment in accordance with the terms of this Agreement, the Contractor agrees to keep the Work and the site of the Project and all project bonds free and clear of all bond claim and verified claims related to labor and materials furnished in connection with the Work.

j. If the Owner is entitled to reimbursement or payment from the Contractor under or pursuant to the Contract Documents, such payment shall be made promptly upon demand by the Owner. Notwithstanding anything contained in the Contract Documents to the contrary, if the Contractor fails to promptly make any payment due the Owner, or if the Owner incurs any costs and expenses to cure any default of the Contractor or to correct defective Work, the Owner shall have an absolute right to offset such amount against the Contract Sum and may, at the Owner's sole discretion, elect either to (i) deduct an amount equal to that which the Owner is entitled from any payment then or thereafter due the Contractor from the Owner, or (ii) issue a written notice to the Contractor reducing the Contract Sum by an amount equal to that which the Owner is entitled.

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Section 9.7 Failure of Payment

If the Design Professional does not issue a Certificate for Payment, through no fault of the Contractor, within seven (7) days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within the date established in the Contract Documents, the amount certified by the Design Professional, then the Contractor may, upon seven (7) additional days' written notice to the Owner and Design Professional, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

Section 9.8 Substantial Completion

a. "Substantial Completion" is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use, all major systems are operational, and all safety features are completed and Owner's receipt of written confirmation after final inspections by the applicable electrical, plumbing, fire department, health department, and other local and state officials having jurisdiction, stating the project is ready for occupancy by the Owner. In addition to the other requirements of the Contract Documents, and without limitation, the Contractor must also have obtained the written approval and issuance of any occupancy permits required by the laws of local government(s) and the State of Texas before the Contractor shall be deemed to have achieved Substantial Completion.
b. When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Design Professional a comprehensive list of items to be completed or corrected prior to final payment. The Contractor shall proceed promptly to complete and correct items on the list. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. The Contractor will also provide the Design Professional a comprehensive list of all claims previously and properly made in writing and identified by the Contractor as unsettled at the time of Substantial Completion.
c. Upon receipt of the Contractor's list, the Design Professional will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Design Professional's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Design Professional. In such case, the Contractor shall then submit a request for another inspection by the Design Professional to determine Substantial Completion.
d. When the Work or designated portion thereof is substantially complete, the Design Professional will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

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e. The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

f. The Contractor's acceptance of payment per Section 9.8.e shall constitute a waiver for all purposes of all claims or causes of action by the Contractor against the Owner and the Design Professional, except those previously and properly made in writing and identified in the list provided by the Contractor as unsettled at the time of Substantial Completion per Sections 9.8.b.

Section 9.9 Partial Occupancy or Use

a. The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, as such occupancy or use is consented to by the insurer and required under Section 11.3 provided it is authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Design Professional as provided under Section 9.8.b. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Owner.

b. Immediately prior to such partial occupancy or use, the Owner, Contractor, and Design Professional shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

c. Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

Section 9.10 Final Completion and Final Payment

a. Upon receipt of the Contractor's written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Design Professional will promptly make such inspection. When the Design Professional finds the Work acceptable under the Contract Documents and the Contract fully performed, the Design Professional will promptly issue a final Certificate for Payment stating that the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Design Professional's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.b as precedent to the Contractor's being entitled to final payment have been fulfilled. All warranties and guarantees required under Section 3.5 or otherwise required pursuant to the Contract Documents shall be assembled and delivered by the Contractor to the Design Professional as part of the final

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Application for Payment. The final Certificate for Payment will not be issued by the Design Professional until all warranties and guarantees have been received and accepted by the Owner. "Final Completion" occurs when all the conditions of this Section and the Contract Documents are met as set forth herein.

b. Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Design Professional and Owner; (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or Owner's property might be responsible or encumbered (less amounts withheld by the Owner) have been paid or otherwise satisfied; (2) a certificate evidencing that insurance required by the Contract Documents to remain in full force after final payment is currently in effect; (3) a written statement satisfactory to the Owner that the insurance will cover the period required by the Contract Documents; (4) consent of surety to final payment; (5) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract for Construction, to the extent and in such form as may be designated by the Owner and Owner's lender; (6) certification by the Contractor that (i) all Work has been completed in accordance with the Contract Documents, (ii) the final Application for Payment includes all claims of the Contractor against the Owner arising in connection with the Project and constitutes a waiver and release of any and all claims not presented in that application except for claims arising out of third party actions, cross-claims and counterclaims, and (iii) the Record Drawings maintained by the Contractor pursuant to the Contract Documents and delivered to the Owner or Design Professional are complete and accurate in all respects; and (7)evidence of compliance with all requirements of the Contract Documents, such as notices, certificates, affidavits, or other requirements to complete obligations under the Contract Documents, including, but not limited to, (i) instruction of the Owner's representatives in the operation of mechanical, electrical, plumbing, and other systems; (ii) delivery of keys to the Owner with keying schedule (master, submaster, and special keys); (iii) delivery to the Owner of the Contractor's warranties as set forth in the Contract Documents and each written warranty and assignment thereof prepared in duplicate, certificates of inspections, and bonds for the Design Professional's review and delivery to the Owner; (iv) delivery to the Owner of printed operating, servicing, maintenance and cleaning instructions for all Work (parts lists and special tools for mechanical and electrical work) in approved form; (v) delivery to the Owner of the Record Drawings; (vi) delivery to the Owner of a Final Waiver and Release of Liens covering all Work for itself and for each Subcontractor, vendor, and material supplier who furnished labor, materials, and services to the Work, executed by an authorized officer and duly notarized; (vii) delivery to the Owner of final waivers of lien from each subcontractor and material supplier who furnished labor, materials, and services to the Work, executed by their respective officers and duly notarized; and (viii) delivery of sales and use tax certificate number of the Contractor. In addition to the foregoing, all other submissions required by other Articles and Paragraphs of the Specifications and other Contract Documents shall be submitted to the Owner before approval of final payment. If a Subcontractor refuses to furnish a release or waiver required by the Owner and Owner's lender (if any), the Contractor may furnish a bond satisfactory to the Owner and Owner's lender (if any) to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the

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Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and attorneys' fees.

i. In addition to items listed in 9.10.b to be submitted before Final Payment will be made or remaining retainage released, Contractor shall deliver a permanent certificate of occupancy from local authorities having jurisdiction.

c. If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Design Professional so confirms, the Owner shall, upon application by the Contractor and certification by the Design Professional, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Design Professional prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

d. The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

.1 bond claims, Claims, liquidated damages, security interests, or encumbrances arising out of the Contract and unsettled;

.2 failure of the Work to comply with the requirements of the Contract Documents;

.3 terms of special warranties required by the Contract Documents;

.4 audits performed by the Owner, if permitted by the Contract Documents, after final payment; or

.5 gross negligence, willful misconduct, or fraudulent concealment in connection with the performance of the Contract.

e. Application for and acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee against the Owner or Design Professional except those previously made in writing and identified by that payee arising after the waiver given at Substantial Completion payment described in Sections 9.8.b and 9.8.f.

f. In addition to any other damages, failure of the Contractor to achieve final completion within sixty (60) days after the specified date of Substantial Completion, subject to authorized extensions, will result in the Contractor being responsible for excess Design Professional's and other Owner's consultant(s)' fees beyond their original scope of services required to achieve final completion ("Excess Fees"). Excess Fees will be deducted from the amount due the Contractor.

Article 10. PROTECTION OF PERSONS AND PROPERTY

Section 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract. Contractor's and all

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Subcontractors' Safety Programs shall comply with all applicable requirements of the Occupational Safety and Health Act of 1970, and all other applicable state, local, or federal laws or regulations.

Section 10.2 Safety of Persons and Property

a. The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to all of the following:
   .1 employees on the Work and other persons who may be affected thereby;
   .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
   .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.
b. The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.
c. The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards. The Contractor shall also be responsible, at the Contractor's sole cost and expense, for all measures necessary to protect any property adjacent to the Project and improvements therein. Any damage to such property or improvements shall be promptly repaired by the Contractor.
d. When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel, and the Contractor shall give the Owner and the Design Professional reasonable advance written notice of such planned activities.
e. The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.a.2 and 10.2.a.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.a.2 and 10.2.a.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Design Professional or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.
f. The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Design Professional.
g. The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

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h. Injury or Damage to Person or Property
If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

i. The Contractor shall immediately report in writing to the Owner and Design Professional all accidents arising out of or in connection with the Work that cause death, personal injury, or property damage, giving full details and statements of any witnesses. In addition, if death, serious personal injuries, or serious damages are caused, the accident shall be reported immediately electronically, as well as by telephone or messenger to the Owner and the Design Professional.

Section 10.3 Hazardous Materials and Substances

a. Hazardous materials include any material in such quantity, concentration, and physical or chemical characteristics including, but not limited to, ignitability or toxicity, so as to be capable of posing an unreasonable risk to health, safety and/or property if released into the atmosphere, transported, stored, or disposed of. The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Design Professional of the condition in writing.

.1 For the purposes of this section, the following terms have the below meanings (however, each definition should be read as broadly as possible to incorporate similar hazardous materials or substances:

Asbestos: any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

Petroleum: Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), and including but not limited to oil, fuel oil, oil sludge, oil refuse, gasoline, diesel fuel, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.

Hazardous Waste: any solid waste listed as hazardous or which possesses one or more hazardous characteristics.

b. Upon receipt of the Contractor's written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Design Professional the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or

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substance. The Contractor and the Design Professional will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Design Professional has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Design Professional have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order duly processed and approved, the Contract Time shall be extended appropriately, and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up, both as specified in Article 7. The term "rendered harmless" shall be interpreted to mean, without limitation that levels of hazardous materials, including, but not limited to, asbestos and polychlorinated biphenyls, are less than any applicable exposure standards set forth in OSHA regulations. In no event, however, shall the Owner have any responsibility for any substance or material that is brought to the Project site by the Contractor, any Subcontractor, any material supplier, or any entity for whom any of them is responsible. The Contractor agrees not to use any fill or other materials to be incorporated into the Work that are hazardous, toxic, or made up of any items that are hazardous or toxic.

c. Omitted.

d. The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

e. Omitted.

f. **THE CONTRACTOR SHALL INDEMNIFY THE OWNER FOR THE COST AND EXPENSE THE OWNER INCURS (1) FOR REMEDIATION OF A MATERIAL OR SUBSTANCE THE CONTRACTOR BRINGS TO THE SITE AND NEGLIGENTLY HANDLES, OR (2) WHERE THE CONTRACTOR FAILS TO PERFORM ITS OBLIGATIONS UNDER SECTION 10.3.a, EXCEPT TO THE EXTENT THAT THE COST AND EXPENSE ARE DUE TO THE OWNER'S FAULT OR NEGLIGENCE.**

Section 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

Section 10.5 Site Visits

Anyone other than the Owner's designated representatives, the Design Professional, the Design Professional's consultants, and the Owner's other consultants visiting the job site who is not employed by a Contractor shall be required to register with the Contractor's site office before proceeding onto the job site.

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Article 11. INSURANCE AND BONDS

Section 11.1 Contractor's Liability Insurance

a. The Contractor shall purchase and maintain in a company or companies lawfully authorized to do business in Texas and as further qualified in Paragraph 11.6, such insurance as will protect the Contractor and the Indemnitees from claims set forth below which may arise out of or result from the Contractor's operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

.1 Claims under workers' compensation, disability benefit and other similar employee benefit acts which are applicable to the Work to be performed; including private entities performing Work at the site and exempt from the coverage on account of number of employees or occupation, which entities shall maintain voluntary compensation coverage at the same limits specified for mandatory coverage for the duration of the Project;

.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees; or persons or entities exempt by statute from the requirements of Section 11.1.a.1, but required by the Contract Documents to provide the insurance required by that Section;

.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;

.4 Claims for damages insured by usual personal injury liability coverage;

.5 Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;

.6 Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle, including pollution clean-up if hauling hazardous materials; and

.7 Claims for bodily injury or property damage arising out of completed operations, which coverage shall be maintained for no less than ten (10) years following final payment.

.8 Claims for damages to the Work, and/or materials and equipment used/stored at the Work, as may be covered under any Builder's Risk insurance policy.

b. The Contractor's Commercial General Liability Insurance should be written on ISO Form CG 00 01 10 01 or its equivalent and provide the following:

.1 Premises/operations (Including X-C-U coverages);

.2 Independent contractors;

.3 Products and completed operations with a per project aggregate limit, which coverage shall be maintained for a period of ten (10) years from the date of the Final Payment;

.4 Personal injury (libel, slander, false arrest) liability with employment exclusion deleted;

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.5 Blanket Contractual, including, but not limited to, a specified provision for the Contractor's obligations under Section 3.18 of the Contract Documents;

.6 Broad form property damage including, but not limited to, completed operations;

.7 Primary and Non-Contributory endorsement in favor of Indemnitees; and

.8 Contain a Waiver of Subrogation in favor of Indemnitees.

c. Professional Errors and Omissions Liability Insurance is required for all licensed and certified professionals, including, but not limited to, contractors, engineers, Design Professionals, design-build and design professionals as follows:

.1 The retroactive date preceding the date of the contract; and

.2 An extended reporting period of three (3) years past substantial completion.

d. Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

e. The Contractor shall, for the protection and benefit of the Indemnitees and the Contractor and as part of the Contractor's efforts to satisfy the obligations set forth in this Article 11, procure, pay for, and maintain in full force and effect, at all times during the performance of the Work until final acceptance of the Work; and for such duration as required in the Contract Documents; policies of insurance issued by a responsible carriers acceptable to the Owner, and in form and substance satisfactory to the Owner, that afford the coverages set forth in the Schedule of Insurance, attached to the Contract and made a part of it as Exhibit "YX" – Contractor's Insurance Certificate(s). All such insurance shall be written on an occurrence basis, with the sole exception of Professional Errors and Omissions Liability Insurance. In the event professional liability coverage is not available on "an occurrence" basis, a "claims made" basis policy with effective and retroactive dates prior to the effective date of the Contract Documents and an extended reporting period of at least three (3) years beyond Substantial Completion or as otherwise required by the Contract Documents, whichever is greater, may be substituted with the written consent and approval of the Owner and Design Professional. The Contractor's completed operations coverage shall be maintained until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

f. The Contractor agrees to deliver to the Design Professional, for transmittal to the Owner with a copy to the Design Professional within ten (10) days of the date of the Owner-Contractor Agreement and prior to bringing any equipment or personnel onto the site of the Work or the Project site, and thereafter upon renewal or replacement of each required policy of insurance, certified copies of all required insurance policies procured by the Contractor under or pursuant to this Article 11 or, with the written consent of the Owner and Design Professional, Certificates of

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Insurance in form and substance satisfactory to the Owner and Design Professional evidencing the required coverages with limits not less than those specified in Section 11.1.k below and all endorsements as required in Article 11 herein. The coverage afforded under any insurance policy obtained under or pursuant to this Section 11.1 shall be primary to any valid and collectible insurance carried separately by any of the Indemnitees. Furthermore, all policies and Certificates of Insurance shall expressly provide that no less than thirty (30) days prior written notice (ten (10) days for non-payment of premium) shall be given the Design Professional and Owner in the event of material alteration, cancellation, nonrenewal or expiration of the coverage contained in such policy or evidenced by such certified copy or Certificate of Insurance. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.b and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.e. Information concerning reduction of coverage shall be furnished by the Contractor with reasonable promptness.

g. Certificates of Insurance with the following or similar wording are not acceptable: "Failure to notify the certificate holder shall impose no obligation or liability of any kind upon the insurer, its agents or representatives."

h. In no event shall any failure of the Design Professional to receive certified copies or certificates of policies required under Paragraph 11.1.f or to demand receipt of such certified copies or certificates prior to the Contractor's commencing the Work be construed as a waiver by the Owner of the Contractor's obligations to obtain insurance pursuant to this Article 11.

i. When any required insurance, due to the attainment of normal expiration date or renewal date, shall expire, the Contractor shall furnish to the Design Professional Certificates of Insurance and amendatory riders or endorsements that clearly evidence the continuation of all coverage in the same manner, limits of protection, and scope of coverage as was provided by the previous policy forty-five (45) days prior to renewal date. In the event any renewal or replacement policy, for whatever reason obtained or required, is written by a carrier other than that with whom the coverage was previously placed, or the subsequent policy differ in any way from the previous policy, the Contractor shall also furnish the Design Professional with a certified copy of the renewal or replacement policy unless the Owner provide the Contractor with prior written consent to submit only a Certificate of Insurance for any such policy. All renewal and replacement policies shall be in form and substance satisfactory to the Owner and Design Professional and written by carriers acceptable to the Owner and Design Professional.

j. Any Aggregate limit under the Contractor's liability insurance, shall by endorsement, apply to this Project separately.

k. The Contractor shall notify the Owner and Design Professional in writing of any reduction in collectible limits (aggregate limits) by an amount in excess of Fifty Thousand Dollars ($50,000), and the Contractor shall promptly procure, at no expense to the Owner, such additional coverage as necessary to restore the valid and collectible limits of such insurance to that required under the Contract Documents.

l. The Contractor shall cause each Subcontractor to procure insurance congruent with the Contractor's insurance requirements as specified in the Contract Documents and satisfactory to the Owner and Design Professional and name each of the Indemnitees as additional insureds under the Subcontractor's commercial general liability, automobile and umbrella excess liability

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policies. The additional insured endorsement included on the Subcontractor's commercial general liability policy shall state that coverage is afforded the additional insureds with respect to claims arising out of all on-going and completed operations performed by or on behalf of the Contractor. Each policy shall contain a Waiver of Subrogation in favor of the Indemnities, provide for forty-five (45) day notice of cancellation or non-renewal, and be primary without contribution if the additional insureds have other insurance that is applicable to the loss. If the additional insureds have other insurance that is applicable to the loss, such other insurance shall be on an excess or contingent basis. The amount of the insurer's liability under this insurance policy shall not be reduced by the existence of such other insurance.

m. The Indemnitees shall also be shown as "Additional Insureds" on the property, commercial general liability, automobile liability and umbrella (excess) liability policies and evidence of same must be included in Certificates of Insurance. Copies of policy endorsements must be provided listing the Indemnities as Additional Insureds, using ISO forms CG2010, CG2037, CA0070, CA0032 or their equivalents, and approved as to form by Owner.

n. A "waiver of subrogation" clause in favor of the Owner will be attached to the workers compensation, commercial general liability, umbrella (excess) liability, automobile and the any applicable property insurance policies and evidence of same must be included in Certificates of Insurance. Copies of policy endorsements must be provided showing waivers of subrogation in favor of the Indemnities using ISO forms CG2404, CA0070, CA0032, WC0003 or their equivalents, and approved as to form by Owner.

o. The Owner reserves the right to review the insurance requirements during the effective period of its Agreement with the Contractor, and provide a written request for the Contractor to make any reasonable and commercially available adjustments to insurance coverages and\or limits when deemed reasonably prudent by the Owner based upon its unilateral interpretation of changes in statutory law, court decisions or the Owner's potential increase in exposure to loss.

p. Neither Contractor, Subcontractor, Sub-subcontractor, nor any of their insurance carrier's liability obligations shall be limited to the minimum limits of coverage of insurance maintained or required to be maintained by the Contract Documents.

Section 11.2 Owner's Liability Insurance

a. The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance.

Section 11.3 Property Insurance

a. The Contractor shall purchase and maintain "builder's risk" property insurance, or comparable coverage, for the full replacement cost value thereof, for (i) the Work that is to be done, (ii) all insurable items of Work, title to which has been acquired by Owner in accordance with the Contract Documents and (iii) all materials to be incorporated in the Work, if such materials are in or upon the Premises, or in transit to Premises, whether or not title has been acquired by Owner. Such insurance shall not cover any property owned, leased, or otherwise used in connection with the Work by Contractor, Contractor's subcontractors or the agents or employees of them, that is not forming a permanent part of the Project. This insurance shall include the interests of Owner, Contractor, and Subcontractors and shall provide coverage against loss for "direct physical damage" (previously known as "all risk" coverage) including, but not limited to, without

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duplication of coverage, fire, extended coverage, vandalism and malicious mischief, theft, collapse, earthquake, flood, sprinkler leakage, windstorm, testing and startup, temporary buildings and debris removal including demolition and increased cost of construction occasioned by enforcement of any applicable legal requirements.

b. Any coverage related to the builder's risk property insurance maintained by Contractor for time including delay in opening and/or extra expenses shall inure to the benefit of Owner only. Owner shall be the only party insured under such policy, with the sole exception that the Contractor may be entitled to payment of its fee and general conditions associated with the reconstruction, less any deductible.

c. The Contractor's insurance shall cover against loss for "direct physical damage" (previously known as "all risk" coverage) with sufficient limits to protect the full replacement cost value of the Work.

d. If by the terms of the property insurance there is a deductible amount, in the event of a loss covered by such insurance, Contractor shall be responsible for all deductibles per occurrence which shall be considered a Cost of the Work for all insurable items of Work and materials to be incorporated in the Work, title to which has not been acquired by Owner in accordance with the Contract Documents. Except for Contractor's deductible risk, Owner is bearing all risk of loss to the Property for which Owner, Contractor, and others have an insurable or financial interest during construction, and, in the event of a loss to the property during construction, Owner agrees to rely solely to the proceeds of the Builder's Risk Insurance which Owner Contractor has agreed to furnish.

e. To the extent permitted by law, Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other, and (2) Owner's Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Section or other property insurance applicable to the Work. Owner or Contractor, as appropriate, shall require of Owner's Separate Contractors, if any, and the subcontractors, sub-subcontractors, agents, and employees of any of them, by written appropriate agreement, similar waivers each in favor of other parties enumerated herein.

f. To the degree allowed by the insurer, Owner and Contractor shall each have its policies endorsed to provide for a waiver of the right of subrogation against the other respective party.

g. Any loss insured pursuant to this Section 11.3 Property Insurance is to be adjusted by Owner and made payable to Owner as trustee for the insureds, as their interests may appear, subject to the requirements of any applicable mortgagee clause. Contractor shall pay each Subcontractor a just share of any insurance monies received by Contractor, and by appropriate written agreement, shall require each Subcontractor to make payments to its Sub-subcontractors in similar manner.

h. Upon request, Owner shall make available for inspection by Contractor a copy of all policies to be furnished by Owner.

Section 11.4 Performance, Maintenance, and Payment Bond

a. The Contractor must furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract. Such bonds shall be issued in an amount equal to the total Contract Sum by a surety company licensed in the state where the

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Project is located, with a current A.M. Best rating of at least A- X, included on the U.S. Treasury Department's listing of approved sureties, and acceptable to the Owner and Design Professional, or as expressly agreed otherwise by the Owner and Design Professional in writing.

.1 Except as otherwise required by statute, the form and substance of such bonds shall be satisfactory to the Owner in the Owner's sole judgment and shall satisfy the requirements Texas Government Code Chapters 2253 and 2269.

.2 The Performance Bond, Maintenance Bond, and the Labor and Material Payment Bond shall each be in an amount equal to the Contract Sum and all subsequent increases.

.3 Every Bond under this Section 11.4.a must display the Surety's Bond Number and a rider including the following provisions, which shall be attached to each Bond:

a) The Surety hereby agrees that it consents to and waives notice of any addition, alteration, omission, change, or other modification of the Contract Documents;

b) Any addition, alteration, change, extension of time, or other modification of the Contract Documents, or a forbearance on the part of either the Owner or the Contractor to the other, shall not release the Surety of its obligations hereunder, and notice to the Surety of such matters is hereby waived; and

c) The Surety agrees that it is obligated under the bonds to any successor, grantee, or assignee of the Owner.

b. Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

c. The Bond Form shall be in a form provided by the Owner.

d. Additional Performance, Maintenance, and Payment Bonds may be recommended by the Design Professional and required by the Owner, at the Owner's sole discretion, from any Subcontractor. The Owner will pay such actual, additional expenditures as Cost of the Work using the process specified in Article 7 for Changes in the Work. All such bonds shall be in form and substance satisfactory to the Owner and Design Professional.

e. The Contractor shall deliver the required bonds to the Owner no later than three (3) business days following the date of the Agreement is entered into, or if the Work is to be commenced prior to the date the Agreement is entered into, in response to a notification of award. The Contractor shall, prior to the commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished.

f. The Contractor shall require the attorney-in-fact who executes the required bond on behalf of the surety to affix thereto a certified and current copy of the power of attorney.

Section11.5 Adjustment and Settlement of Insured Loss

a. 11.5.1 Omitted.

b. Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have fourteen (14) days from receipt of notice to object to the proposed settlement or

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allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

Section 11.6 Insurance Companies

All insurance coverage procured by the Contractor shall be provided by insurance companies having current policyholder ratings no lower than "A- X" by A.M. Best and acceptable by the Owner and Design Professional, or as expressly agreed otherwise by the Owner, Contractor and Owner in writing. Such companies must be licensed to do business in the State of Texas.

Section 11.7 Failure to Purchase Insurance

If one or more of the Indemnitees, or the Contractor is damaged by the failure of either the Owner or the Contractor to purchase or maintain the insurance required under this Article 11, then the party who failed to purchase or maintain the insurance shall bear all reasonable costs (including attorneys' fees and court and settlement expenses) properly attributable to the failure.

Section 11.8 Insurance Limits Required

The following insurance limits are the minimums to be carried by the Design Professional, the Design Professional's consultants, the Owner's other consultants, the Contractor, and the Subcontractors, Sub-subcontractors, and suppliers, unless higher limits are required by their respective Agreements or Texas law (in which case those limits shall control):

.1 Automobile Liability
$1,000,000 Combined Single Limit

.2 Commercial General Liability
$1,000,000 Aggregate, Per Occurrence and Personal Injury
$2,000,000 General Aggregate
$2,000,000 Products/Completed Operations Aggregate
$1,000,000 Personal and Advertising Injury
$500,000 Fire Damage
$5,000 Medical Payments

.3 Worker's Compensation
Statutory Limits
$1,000,000 Employers Liability

.4 Umbrella or Excess Liability
$10,000,000 Per Occurrence

.5 Contractor's Environmental Impairment/Pollution coverage
$1,000,000 Occurrence or Claim

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$2,000,000 Policy Aggregate

.6 Builder's Risk (where applicable)

100% of the total value of the work

a. Limits for primary policies may differ from those shown when Umbrella or Excess Liability insurance is provided, as long as all coverage is equal to or greater than the minimum limits required herein.

Article 12. UNCOVERING AND CORRECTION OF WORK

Section 12.1 Uncovering of Work

a. If a portion of the Work is covered contrary to the Design Professional's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Design Professional, be uncovered for the Design Professional's examination and be replaced at the Contractor's expense without change in the Contract Time.

b. If a portion of the Work has been covered that the Design Professional has not specifically requested to examine prior to its being covered, the Design Professional may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

Section 12.2 Correction of Work

a. Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Design Professional or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, specifically including but not limited to additional testing and inspections, the cost of uncovering and replacement; the cost of any additional supervision, material, labor, equipment, rental charges, home office overhead, and other expenditures necessitated to both rectify the non-complying conditions, protect adjacent Work of both the Contractor and the Project, and restore Work by the Contractor and others necessarily damaged in the course of rectifying the non-complying conditions; as well as compensation for the Design Professional's services and expenses made necessary thereby, shall be at the Contractor's expense.

i. If prior to the date of Substantial Completion the Contractor, a Subcontractor, or anyone for whom either is responsible uses or damages any portion of the Work, including, without limitation, mechanical, electrical, plumbing, and other building systems, machinery, equipment, or other mechanical device, the Contractor shall cause such item to be restored to "like new" condition at no expense to the Owner. In addition, the Contractor shall promptly remedy damage and loss arising in conjunction with the Project caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, supplier, or anyone directly or indirectly employed by any of them, or anyone for whose acts they may be liable or for which the Contractor is otherwise responsible.

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b. After Substantial Completion

i. In addition to the Contractor's obligations under Section 3.5, if, within two years after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.a, or by terms of any applicable special warranty required by the Contract Documents, or within such longer period of time as may be prescribed by law, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. If the condition is reasonably discoverable, during the two-year period for correction of Work, and the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Design Professional, the Owner may correct it in accordance with Section 2.5, and charge the reasonable costs to the Contractor.

ii. The two-year period for correction of Work shall also be extended by the period of time between Substantial Completion and the actual completion of the corrective Work performed by the Contractor pursuant to this Section 12.2, but only with respect to the corrected portions of the Work.

iii. Omitted.

c. Omitted.

d. The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents. These costs specifically include, but are not limited to such additional supervision, material, labor, equipment rental charges, home office overhead, and other expenditures necessitated to rectify the non-complying conditions, protect adjacent Work, and restore Work by the Contractor and others necessarily damaged in the course of rectifying the non-complying conditions.

e. Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.b relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

f. The Contractor's obligations under this Section 12.2 shall, without limitation, survive acceptance of the Work under the Contract and termination of the Contract.

Section 12.3 Acceptance of Nonconforming Work

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If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made. In the event final payment has been made by the Owner subsequent to accepting such non-conforming Work, the Contractor shall pay the Owner for the reduction in the Contact Sum occasioned by such acceptance.

Article 13. MISCELLANEOUS PROVISIONS

Section 13.1 Governing Law

The Contract shall be governed by the laws of the state of Texas. Venue on any dispute arising out of this Contract shall be in Denton County, Texas, which is the place where the Project is located and where performance is primarily to occur.

Section 13.2 Successors and Assigns

a. The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to the covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.b, neither party to the Contract shall assign the Contract, or any rights under the contract, in whole or in part without the written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.
b. The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.
c. Written Notice
Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at or sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice.

Section 13.3 Rights and Remedies

a. Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.
b. No action or failure to act by the Owner, Design Professional, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

Section 13.4 Quality Management Tests and Inspections

a. Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or

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lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Design Professional timely notice of when and where tests and inspections are to be made so that the Design Professional may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require. As required by the provisions of Texas Government Code, Section 2269.058(a), the Owner shall provide or contract for the construction materials engineering, testing, and inspection services and the verification testing services necessary for acceptance of the facility by the Owner. To the extent that any of the provisions of this Section 13.4 or other provisions of this Agreement conflict with any of the provisions of Section 2269.058(a) such conflict is unintentional, and the provisions of the Texas Government Code shall control.

b. If the Design Professional, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.a, the Design Professional will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Design Professional of when and where tests and inspections are to be made so that the Design Professional may be present for such procedures. Such costs, except as provided in Section 13.4.c, shall be at the Owner's expense.
c. If such procedures for testing, inspection, or approval under Sections 13.4.a and 13.4.b reveal failure of the portions of the Work to comply with requirements established by the Contract Documents ("Failed Work"), all costs made necessary by the Failed Work, including those of repeated procedures and compensation for the Design Professional's services and expenses and all costs specified in Section 12.2 shall be at the Contractor's expense. The Contractor also agrees all costs of testing, inspection, and approval services required for the correction of the Failed Work and the cost of such similar services related to remedial operations performed to the Failed Work shall be borne by the Contractor.
d. Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Design Professional.
e. If the Design Professional is to observe tests, inspections, or approvals required by the Contract Documents, the Design Professional will do so promptly and, where practicable, at the normal place of testing.
f. It is the intent of the Construction Documents to require the Contractor to control the quality of the Work using the processes specified in the Contractor's Quality Management, Commissioning, and Turnover Plan contained within the most recent Construction Management Plan approved by the Owner and Design Professional. Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work and shall conform to the most recently approved Contractor's Construction Schedule.

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g. The responsibility for implementing the Quality Management, Commissioning and Turnover Plan is the Contractor's, as is the obligation to provide the Work and a complete and functional project per the Contract Documents. Notwithstanding anything herein, or in subsequently approved Quality Management, Commissioning and Turnover Plans, the Owner's review and Design Professional's approval of such plan(s) does not relieve the Contractor in any way of this responsibility.

h. The Contractor shall be in charge of scheduling; re-scheduling (when required); and confirming adequate distribution of reports and other findings from all testing and inspections of the Work. This responsibility includes, but is not limited to, scheduling the testing services of a certified testing laboratory which, by statute shall be contracted to and paid for by the Owner. The certified testing laboratory shall be acceptable to the Design Professional; and shall perform the tests as called for in the Contract Documents. The conditions that apply to materials testing and inspections include, but are not limited to the following:

.1 The frequency and type of Quality Control testing shall be established by the Contractor and shall be sufficient to insure the delivery of the Work and a complete and functional project per the Contract Documents. The type and amount of testing required by the Contract Documents shall be seen as the minimums required, and shall be increased, if in the opinion of the Contractor, more testing is needed to meet the requirements of the Contractor.

.2 The Contractor shall concurrently provide the Design Professional copies of all test results it receives within three (3) business days of receipt of same.

.3 The Owner shall provide such Quality Assurance testing as it and the Design Professional mutually agree to be adequate for their own needs. The Owner shall distribute the results of its own Quality Assurance tests as it, at its sole discretion, deems appropriate. The provision of Quality Assurance testing by the Owner, or lack thereof shall in no manner affect the responsibilities of the Contractor or Design Professional under this Agreement.

i. The Contractor shall facilitate and conduct weekly (or more frequent if necessary) meetings on site for the coordination of all mechanical, electrical and special systems installation activities and possible interference(s) above ceilings, in mechanical rooms, etc. The mechanical trades shall typically have preference in the event of conflicts, and therefore the mechanical contractor's coordinator will usually lead each meeting, unless the Contractor decides another trade or the Contractor should take the lead. The Design Professional shall be informed of the meetings at least seven (7) days in advance, and the appropriate Design Professional's consultants should be invited to attend by the Contractor, as supplemented and coordinated by the Design Professional.

j. The Contractor's Quality Management, Commissioning and Turnover Plan shall specify that prior to completion and acceptance of any building system or phase, consistent with the Contract and applicable codes and Contractor will review, in detail, the steps for completing testing of all building systems with the Owner and Design Professional. This plan shall be coordinated with and shall be made part of the Contractor's Construction Schedule. All testing shall be of each complete system, before covering, or of individually separable larger portions of each system and shall be performed in the presence of the appropriate Owner's and Design Professional's consultant(s), representatives of the Owner, and at its option, either or both the Design Professional.

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k. When heating, air conditioning, ventilating, exhaust, or other items of mechanical, electrical or other similar equipment are installed, or other systems or equipment requiring testing as may be specified in the Contractor's Quality Management, Commissioning and Turnover Plan, it shall be the responsibility of the Contractor, Subcontractor or Sub-subcontractor installing such equipment to operate it for a period of time satisfactory to the Owner prior to acceptance and before the start of Warranty. The duration of such operation shall be as the Owner, Owner's consultant(s), Design Professional's consultant(s), Owner' employees and other Owner's representatives (the Turnover Team) shall reasonably require for proper testing of the respective system and thorough instruction of the Owner's operating personnel.

l. All equipment, testing instruments, instruction materials and incidentals required for proper testing of such systems and thorough instruction of the Owner's operating personnel on each system's operations and maintenance shall be provided by the Contractor, Subcontractor or Sub-subcontractor responsible for providing and installing the equipment. Such tests and instruction shall be in meetings held solely for this purpose (the Turnover Meetings), which shall be coordinated and managed by the Contractor, who shall show their dates in the Contractor's Construction Schedule at least sixty (60) days prior to occurrence. The Contractor shall schedule the Turnover Meetings at times reasonably convenient for the Owner's consultant(s), Design Professional's consultant(s), Owner's employees and other Owner's representatives that the Owner and Design Professional agree are necessary to attend for each system. The Design Professional may attend such Turnover Meetings at its discretion.

m. The Contractor shall provide a digital video record to the Owner, with copies to the Design Professional of all meetings for the purpose of Owner operational staff instruction or training; as well as commissioning of equipment. These videos will become a permanent part of all Operations and Maintenance manuals as applicable.

n. The Contractor shall prepare a digital video record of the project for the Owner with copies to the Design Professional at such stages as shall be indicated by the Design Professional for the purpose of documenting the location of piping, conduit, equipment, or other construction to be concealed at a later date; recording key inspections and tests; providing evidence of unforeseeable conditions encountered by the Contractor on site; and other construction issues as the Design Professional may reasonably require from time to time.

o. The Contractor shall layout and mark any plantings, shrubs and trees which will require removal a minimum of five (5) business days prior to their removal. The Contractor shall notify the Design Professional in writing immediately upon completion of this marking, and the Design Professional will have the location of these marked plantings, shrubs and trees reviewed and approved (if correct) by the Owner. The Design Professional will then give permission for removal in writing to the Contractor. Plantings, shrubs, and trees shall not be removed or damaged without such permission.

Section 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest as set forth in the provisions of Texas Government Code, Chapter 2251 or its successor statute.

Section 13.6 Time Limits on Claims

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The Owner and Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time period specified by applicable law, but in any case not more than ten (10) years after the date of Substantial Completion of the Work.

Section 13.8 Measurement

Before ordering any material or doing any Work, the Contractor shall verify all measurements for Work completed at the Project and shall be responsible for their accuracy. Any differences found shall be submitted to the Design Professional for consideration before proceeding with the Work. The Contractor shall use its utmost efforts to identify discrepancies in dimensions in a timely fashion and notify the Owner and Design Professional of these prior to commencing any Work affected by the ambiguous dimensions. No extra charge or compensation shall be allowed because of differences between actual measurements and the dimensions indicated on the drawings.

Section 13.9 Expediting Materials

The Contractor shall immediately, after receipt of Notice to Proceed and approval of the list of subcontractors and material suppliers, place orders for all equipment, materials, and supplies required for the Work, and shall submit to the Design Professional evidence that such orders have been placed in accordance with the Contractor's Construction Schedule.

Section 13.10 Addressing the Owner's Additional Needs and Concerns

a. Notwithstanding the above, the Owner has a unique set of stakeholders and organizational structure that creates special challenges the Contractor must completely and successfully address to the satisfaction of the Owner and Design Professional in the performance of the Work under this Agreement. The actions that shall be taken to address these special challenges include, but are not limited to, the following:

    .1 The Contractor shall provide the Superintendent once per month for a scheduled meeting with the Owner for a progress update on the project if requested by the Owner. A walk-through of the site may be held as a part of this meeting, which shall be scheduled by mutual agreement during regular business hours.

    .2 The Contractor may be required to provide the Superintendent for one meeting per month with the Design Professional for the purpose of assisting the Owner in preparing City Council agenda items and assisting City staff in preparing presentations to the City Council for the benefit of the public. The actual preparation and submission of the City Council of any agenda or work session item shall be performed by the Owner.

    .3 In addition to the meetings required to complete the Project, it is anticipated the Owner may request tours from time to time of the project and the site. The Contractor shall indicate in writing when such activity will be permitted and when the site is off limits. These requirements shall be coordinated through the Owner.

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Section 13.11 Additional Provisions

a. In the event that any provision herein is held to be unlawful, against public policy, or a violation of the Charter or Ordinances of the Denton City, Texas, such provision shall be modified to make it valid, or if modification is not possible, such provision shall be deleted and the remainder of this Agreement shall remain in full force and effect.

b. Each party hereto agrees to, without limitation, perform all acts; provide all services, material, equipment, labor and supervision; and to make, execute, and deliver such written instruments, as shall from time to time be reasonably required to carry out the terms and provisions of the Contract Documents.

c. All exhibits referred to in the Contract Documents are, by reference, incorporated herein for all purposes.

d. The captions of the paragraphs are set forth only for convenience and reference, and are not intended in any way to define, limit, or describe the scope or intent of the Contract Documents.

e. Any specific requirement in this Contract that require responsibilities or obligations of the Contractor also apply to a Subcontractor is added for emphasis and is also hereby deemed to include a Subcontractor, Sub-subcontractor or supplier of any tier. The omission of a reference to a Subcontractor in connection with any of the Contractor's responsibilities or obligations shall not be construed to diminish, abrogate, or limit any responsibilities or obligations of a Subcontractor, Sub-subcontractor or supplier of any tier under the Contract Documents or the applicable subcontract.

f. The provisions of the Contract Documents shall not be changed, amended, waived, or otherwise modified in any respect except by a written document signed by Owner. No person is authorized on behalf of Owner to orally change, amend, waive, or otherwise modify the terms of the Contract Documents or any of the Contractor's duties or obligations under or arising out of the Contract Documents. Any change, waiver, approval, or consent granted to the Contractor shall be limited to the specific material restated in the written document signed by Owner and shall not relieve Contractor of any other of the duties and obligations under the Contract Documents.

g. The Contractor shall provide and file, as required by law, all notices required or permitted by the laws of the state in which the Project is located for protection of Owner from liens and claims of lien if permitted or required by applicable law. Contractor shall be responsible for filing in the appropriate court or other governmental office records all such notices as required or permitted by the laws of the state in which the Project is located.

h. The Contractor shall provide Owner with copies of all notices received by Contractor from Subcontractors, Sub-subcontractors, and/or suppliers to Contractor.

i. The Owner is a Texas home-rule municipality and as such is generally exempt from taxation under Texas law, which may include the purchase of items, materials, or supplies purchased on behalf of the Owner for this public works project. Contractor shall confirm that the Owner is exempt before paying taxes for items, materials, or supplies that may not be lawfully charged to the Owner.

j. Owner affirmatively represents that its governing body has duly appropriated such sums which are equal to or in excess of the contract amount, and that such contract amount may be lawfully paid by Owner to Contractor subject to the terms and conditions of the Contract Documents. In the event that Owner approves a Change Order, Construction Change Directive or other additional compensable Work to be performed by Contractor, (other than that contemplated by

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the Contract Documents under any remedy-granting provision), Owner will issue a written assurance at the time of such approval that such additional compensation to be paid has also been duly appropriated by the Owner's governing body.

k. In the event the Owner is required to further advertise the completion of the Work or the Project under any local, state or Federal law, the Contractor shall notify the Owner and Design Professional of such requirement(s) in writing not less than thirty (30) days in advance and attach a copy of the specific advertising and noticing required.

l. The Contractor shall, in addition to compliance with the requirements of Section 3.7.f and without limitation, not knowingly employ or contract with an illegal alien to perform any of the Work under this Agreement. The Contractor shall not knowingly contract with a Subcontractor that (i) knowingly employs or contracts with an illegal alien to perform work under this Agreement or (ii) fails to certify to the Contractor that the Subcontractor will not knowingly employ or contract with an illegal alien to perform work under this Agreement.

   i. The Contractor shall comply with any reasonable request of the Texas Workforce Commission made in the course of an investigation pursuant to state law.

   ii. In addition to any other legal or equitable remedy, and notwithstanding anything to the contrary in the Contract Document the Owner may be entitled to for a breach of the Agreement, if the Owner terminates this Agreement, in whole or in part, due to Contractor's breach of the obligations set forth above in this Section 13.11.1 Contractor shall be liable for actual and consequential damages to the Owner.

m. It is the express intention of the parties that this Agreement is not to be construed as a waiver of any immunities or defenses of the Owner under Texas law.

n. Notwithstanding any other provision in the Contract Documents to the contrary, public property is protected from forced sale and therefore may not be made the subject of a mechanic's lien. Nothing in the Contract Documents shall be construed to allow a mechanic's lien on public property owned by the Owner. The Owner does not waive its immunities or right to object to or contest such a lien.

Article 14. TERMINATION OR SUSPENSION OF THE CONTRACT

Section 14.1 Termination by the Contractor

a. The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

   .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped; or

   .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped.

b. The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100

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percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

c. If one of the reasons described in Section 14.1.a or 14.1.b exists, the Contractor may, upon seven (7) days' notice to the Owner and Design Professional, terminate the Contract and recover from the Owner payment for Work executed, including other costs allowed by the law.

d. If the Work is stopped for a period of sixty (60) consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' written notice to the Owner and the Design Professional, terminate the Contract and recover from the Owner as provided in Section 14.1.c.

Section 14.2 Termination by the Owner for Cause

a. The Owner may terminate the Contract if the Contractor:

.1 refuses or fails to supply enough properly skilled workers or proper materials;

.2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;

.3 disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority;

.4 otherwise is guilty of substantial breach of a provision of the Contract Documents; or

.5 contractor becomes insolvent or makes a general assignment for the benefit of its creditors.

b. When any of the reasons described in Section 14.2.a exist, and upon certification by the Design Professional that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

.1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;

.2 Accept assignment of subcontracts pursuant to Section 5.4; and

.3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

c. When the Owner terminates the Contract for one of the reasons stated in Section 14.2.a, the Contractor shall not be entitled to receive further payment.

d. If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Design Professional's, Design Professional's consultants', and Owner's other consultants' services and expenses made necessary thereby, and other damages incurred by

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the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

i. The costs of finishing the Work include, without limitation, all reasonable attorneys' fees, additional title costs, insurance, additional interest because of any delay in completing the Work, and all other direct and indirect costs incurred by the Owner by reason of the termination of the Contractor as stated herein.

Section 14.3 Suspension by the Owner for Convenience

a. The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

b. The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.a. Adjustment of the Contract Sum shall be as specified in Article 7. No adjustment shall be made to the extent:

.1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or

.2 that an equitable adjustment is made or denied under another provision of the Contract.

Section 14.4 Termination by the Owner for Convenience

a. The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

b. Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall:

.1 cease operations as directed by the Owner in the notice;

.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

c. Upon such termination for the Owner's convenience, the Contractor shall recover as its sole remedy payment for Work properly performed in connection with the terminated portion of the Work prior to the effective date of termination and for items properly and timely fabricated off the Project site, delivered and stored in accordance with the Contract Documents and Owner's further instructions. **The Contractor waives and forfeits all other claims for payment and damages, including, without limitation, anticipated profits, lost opportunity costs, and potential and actual unabsorbed overhead costs.** The Owner shall be credited for (1) payments previously made to the Contractor for the terminated portion of the Work; (2) claims that the Owner has against the Contractor under the Contract; and (3) the value of the materials, supplies, equipment, or other items that are to be disposed of by the Contractor that are part of the Contract.

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Article 15. CLAIMS AND DISPUTES

Section 15.1 Claims

a. Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.a does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

b. Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the dispute resolution method selected in the Agreement and within the period specified by applicable law.

c. Notice of Claims

Claims by either the Owner or Contractor must be initiated by written notice to the other party and to the Initial Decision Maker with a copy sent to the Design Professional, if the Design Professional is not serving as the Initial Decision Maker.; provided, however, that the claimant shall use its best efforts to furnish the Initial Decision Maker and the other party, as expeditiously as possible, with notice of any Claim including, without limitation, those in connection with concealed or unknown conditions, once such claim is recognized, and shall cooperate with the Design Professional and the party against whom the claim is made in any effort to mitigate the alleged or potential damages, delay, or other adverse consequences arising out of the condition that is the cause of such a Claim. Claims by either party must be initiated within twenty-one (21) days after occurrence of the event giving rise to such Claim or within twenty-one (21) days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

i. Claims Made After Final Payment

After Final Payment, Claims made by the Contractor that have not otherwise been waived pursuant to this Contract, must be initiated within one hundred and eighty (180) days from the date of Final Payment by written notice to the Owner as a condition precedent to the Contractor's right to sue on the Contract.

ii. Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.b, shall be initiated by notice to the other party. In such event, no recommendation by the Initial Decision Maker is required.

d. Continuing Contract Performance

i. Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

ii. The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance

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with this Article 15. The Design Professional will prepare Change Orders and issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

e. Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.c shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4. Damages available to the Contractor are limited to those set forth in the Texas Local Government Code, Subchapter I, Section 271.153 or its successor statute(s).

f. Claims for Additional Time

i. If the Contractor wishes to make a Claim for an increase in the Contract Time, the Contractor shall provide written notice as required by Sections 8.3.d. and 8.3.e.

ii. If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented in accordance with Section 8.3.e.

g. Waiver of Claims for Consequential Damages

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

.1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

.2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.g shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

Section 15.2 Initial Decision

Omitted.

Section 15.3 Mediation

a. Claims, disputes, or other matters in controversy arising out of or related to the Contract shall be subject to mediation as a condition precedent to precedent to filing suit in a state district court having competent jurisdiction per the Contract Documents. If a statute of limitations is at issue, then suit may be filed by either party to toll the statute, but the suit shall then be stayed pending completion of the agreed mediation. If the parties cannot agree on a mediator, then the court may appoint one upon application of either party.

b. The parties shall endeavor to resolve their Claims by mediation. A request for mediation, shall be made in writing, delivered to the other party to the Contract.

c. Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a

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demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings.

d. The parties shall share the mediator's fee equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Written agreement(s) reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

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SECTION 00 73 01
SUPPLEMENTARY CONDITIONS - CSP
TO
GENERAL CONDITIONS

Supplementary Conditions

These Supplementary Conditions modify and supplement Section 00 72 00 - General Conditions, and other provisions of the Contract Documents as indicated below. All provisions of the General Conditions that are modified or supplemented remain in full force and effect as so modified or supplemented. All provisions of the General Conditions which are not so modified or supplemented remain in full force and effect.

Defined Terms

The terms used in these Supplementary Conditions which are defined in the General Conditions have the meaning assigned to them in the General Conditions, unless specifically noted herein.

Modifications and Supplements

The following are instructions that modify or supplement specific paragraphs in the General Conditions and other Contract Documents.

SC-1.01 "Defined Terms"

The following Terms are added to the General Conditions as follows:

Competitive Sealed Proposals – A procurement method by which a governmental entity requests proposals, evaluates and ranks the Offerors, and negotiates a contract with a general contractor for the construction, rehabilitation, alteration, or repair of a facility.

Daily Value – The City-determined value in dollars as indicated in the Proposal Form as the value of one Day for the purposes of determining the Incentive (if applicable) for Substantial Completion relative to the Contract Time and achievement of Substantial Completion.

Weekend Working Hours—Those hours between 8:00 a.m. and 8:30 p.m. on Saturday, and between 1:00 p.m. and 8:30 p.m. on Sunday or on a federal or state holiday observed by the City, as approved in advance by the City for performing Work.

Working Day—Defined as a Business Day but excluding any days that weather or other conditions beyond the reasonable control of the Contractor prevents the performance of the principal unit of work underway for a continuous period of not less than 7 hours between 7:00 a.m. and 8:00 p.m.

SC-2.01

Easement limits shown on the Drawings are approximate and were provided to establish a basis for proposals. Upon receiving the final easements descriptions, Contractor shall compare them to the lines shown on the Contract Drawings.

SC-2.01A., "Availability of Lands"

The following is a list of known outstanding right-of-way, and/or easements to be acquired, if any as of May 30, 2025:

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Outstanding Right-Of-Way, and/or Easements to Be Acquired

PARCEL NUMBER	OWNER	TARGET DATE OF POSSESSION
None		

The Contractor understands and agrees that the dates listed above are estimates only, are not guaranteed, and do not bind the City.

If Contractor considers the final easements provided to differ materially from the representations on the Contract Drawings, Contractor shall within five (5) Business Days and before proceeding with the Work, notify City in writing associated with the differing easement line locations.

SC-2.01B., "Availability of Lands"
Utilities or obstructions to be removed, adjusted, and/or relocated

The following is the list of utilities and/or obstructions that have not been removed, adjusted, and/or relocated as of May 30, 2025:

EXPECTED OWNER	UTILITY AND LOCATION	TARGET DATE OF ADJUSTMENT
None		

The Contractor understands and agrees that the dates listed above are estimates only, are not guaranteed, and do not bind the City.

SC-3.01, "Subsurface and Physical Conditions"

The following are reports of explorations and tests of subsurface conditions at the site of the Work:

None

The following are drawings of physical conditions in or relating to existing surface and subsurface structures (except Underground Facilities) which are at or contiguous to the site of the Work:
None

SC-4.01, "Underground Facilities

The following are additional resources for identification of Underground Facilities which are at or contiguous to the site of the Work, and which are not necessarily shown in the Drawings:
None

SC-5.01, "Hazardous Environmental Conditions at Site"

The following are reports and drawings of existing hazardous environmental conditions known to the City:
None

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SC-6.01, "Certificates of Insurance"

The entities listed below are "additional insureds as their interest may appear" including their respective officers, directors, agents and employees.

(1) City
(2) Consultant: Biggs & Mathews Environmental, Inc.
(3) Other:
None

SC-7.01, "Concerning Subcontractors and Suppliers"

The following subcontractors shall be required to be utilized by the Contractor for specific portions of the Work as indicated below:

Required Subcontractors

SUBCONTRACTOR COMPANY NAME	DESCRIPTION OF WORK TO BE PERFORMED
The Autumn Breeze Group, Inc.	Recanvas building, install vents and fans

SC-8.01., "Permits and Utilities"

SC-8.01A., "Contractor obtained permits and licenses"
The following are known permits and/or licenses required by the Agreement to be acquired by the Contractor:

1. City building permit

SC-8.01B. "City obtained permits and licenses"
The following are known permits and/or licenses required by the Agreement to be acquired by the City:
None

SC-8.01C. "Outstanding permits and licenses"

The following is a list of known outstanding permits and/or licenses to be acquired, if any as of May 30, 2025:

Outstanding Permits and/or Licenses to Be Acquired

OWNER	PERMIT OR LICENSE AND LOCATION	TARGET DATE OF POSSESSION
None		

SC-10.01, "Coordination"

The individuals or entities listed below have contracts with the City for the performance of other work at the Site:

Vendor	Scope of Work	Coordination Authority
None		

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SC-11.01, "Communications to Contractor"

SC-12.01, "City's Project Manager"

The City's Project Manager for this Contract is Arturo Garcia, or his/her successor pursuant to **written notification from the City Engineer.**

SC-13.01, "Tests and Inspections"

None

SC-14.01, "Methods and Procedures"

None

SC – 15.01, "Documents"

Any documents submitted to the City in electronic format shall be considered equivalent to an original of such document.

SC – 16.01 "Labor; Working Hours"

1. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.

2. Contractor shall be fully responsible to City for all acts and omissions of Contractor's employees; of Suppliers and Subcontractors, and their employees; and of any other individuals or entities performing or furnishing any of the Work, just as Contractor is responsible for Contractor's own acts and omissions.

3. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours on Business Days. Contractor will not permit the performance of Work outside of regular working hours on Business Days without City's prior written consent (which will not be unreasonably withheld)). Contractor's written request (by letter or electronic communication) for City's written consent must be made as follows:

    a. for Work beyond regular working hours on Business Days, request must be made by noon at least two (2) Business Days prior;

    b. for Work during Weekend Working Hours, request must be made by noon of the preceding Wednesday; and

    c. for Work on state or federal holidays observed by the City, request must be made sufficiently in advance of the holiday, to satisfy requirements for City Council approval.

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END OF SECTION

Revision Log		
DATE	**NAME**	**SUMMARY OF CHANGE**

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SECTION 01 11 00
SUMMARY OF WORK

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Summary of Work to be performed in accordance with the Contract Documents

B. Deviations from this City of Denton Standard Specification

1. None.

C. Related Specification Sections include, but are not necessarily limited to:

1. Division 0 - Bidding Requirements, Contract Forms, and Conditions of the Contract
2. Division 1 - General Requirements

1.2 PRICE AND PAYMENT PROCEDURES

A. Measurement and Payment

1. Work associated with this Item is considered incidental to the various items bid. No separate payment will be allowed for this Item.

1.3 REFERENCES [NOT USED]

1.4 ADMINISTRATIVE REQUIREMENTS

A. Work Covered by Contract Documents

1. Work is to include furnishing all labor, materials, and equipment, and performing all Work necessary for this construction project as detailed in the Drawings and Specifications.

B. Incidental Work

1. Any and all Work specifically governed by documentary requirements for the project, such as conditions imposed by the Contract Documents in which no specific item for bid has been provided for in the Proposal, then the item shall be considered as an incidental item of Work, the cost of which shall be included in the price bid in the Proposal for various bid items.

C. Use of Premises

1. Coordinate uses of premises under direction of the City.
2. Assume full responsibility for protection and safekeeping of materials and equipment stored on the Site.
3. Use and occupy only portions of the public streets and alleys, or other public places or other rights-of-way as provided for in the ordinances of the City, as shown in the Contract Documents, or as may be specifically authorized in writing by the City.
   a. A reasonable amount of tools, materials, and equipment for construction purposes may be stored in such space, but no more than is necessary to avoid delay in the construction operations.

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b. Excavated and waste materials shall be stored in such a way as not to interfere with the use of spaces that may be designated to be left free and unobstructed and so as not to inconvenience occupants of adjacent property.

c. If the street is occupied by railroad tracks, the Work shall be carried on in such manner as not to interfere with the operation of the railroad.

1) All Work shall be in accordance with railroad requirements set forth in Division 0 as well as the railroad permit.

D. Work within Easements

1. Do not enter upon private property for any purpose without having previously obtained permission from the owner of such property.
2. Do not store equipment or material on private property unless and until the specified approval of the property owner has been secured in writing by the Contractor and a copy furnished to the City.
3. Unless specifically provided otherwise, clear all rights-of-way or easements of obstructions which must be removed to make possible proper prosecution of the Work as a part of the project construction operations.
4. Preserve and use every precaution to prevent damage to, all trees, shrubbery, plants, lawns, fences, culverts, curbing, and all other types of structures or improvements, to all water, sewer, and gas lines, to all conduits, overhead pole lines, or appurtenances thereof, including the construction of temporary fences and to all other public or private property adjacent to the Work.
5. Notify the proper representatives of the owners or occupants of the public or private lands of interest in lands which might be affected by the Work.
   a. Such notice shall be made at least 48 hours in advance of the beginning of the Work.
   b. Notices shall be applicable to both public and private utility companies and any corporation, company, individual, or other, either as owners or occupants, whose land or interest in land might be affected by the Work.
   c. Be responsible for all damage or injury to property of any character resulting from any act, omission, neglect, or misconduct in the manner or method or execution of the Work, or at any time due to defective work, material, or equipment.
6. Fence
   a. Restore all fences encountered and removed during construction of the Work to the original or a better than original condition.
   b. Erect temporary fencing in place of the fencing removed whenever the Work is not in progress and when the site is vacated overnight, and/or at all times to provide site security.
   c. The cost for all fence work within easements, including removal, temporary closures and replacement, shall be incidental to the various items bid in the project proposal, **unless a bid item is specifically provided in the proposal**.

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1.5 SUBMITTALS [NOT USED]

1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS [NOT USED]

1.7 CLOSEOUT SUBMITTALS [NOT USED]

1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]

1.9 QUALITY ASSURANCE [NOT USED]

1.10 DELIVERY, STORAGE, AND HANDLING [NOT USED]

1.11 FIELD [SITE] CONDITIONS [NOT USED]

1.12 WARRANTY [NOT USED]

PART 2 - PRODUCTS [NOT USED]

PART 3 - EXECUTION [NOT USED]

END OF SECTION

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SECTION 01 25 00
SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. The procedure for requesting the approval of substitution of a product that is not equivalent to a product which is specified by descriptive or performance criteria or defined by reference to 1 or more of the following:
   a. Name of manufacturer
   b. Name of vendor
   c. Trade name
   d. Catalog number
2. Substitutions are not "or-equals".

B. Deviations from this City of Denton Standard Specification

1. None.

C. Related Specification Sections include, but are not necessarily limited to:

1. Division 0 – Bidding Requirements, Contract Forms and Conditions of the Contract
2. Division 1 – General Requirements

1.2 PRICE AND PAYMENT PROCEDURES

A. Measurement and Payment

1. Work associated with this Item is considered incidental to the various items bid. No separate payment will be allowed for this Item.

1.3 REFERENCES [NOT USED]

1.4 ADMINISTRATIVE REQUIREMENTS

A. Request for Substitution - General

1. Within 30 days after award of Contract (unless noted otherwise), the City will consider formal requests from Contractor for substitution of products in place of those specified.
2. Certain types of equipment and kinds of material are described in Specifications by means of references to names of manufacturers and vendors, trade names, or catalog numbers.
   a. When this method of specifying is used, it is not intended to exclude from consideration other products bearing other manufacturer's or vendor's names, trade names, or catalog numbers, provided said products are "or-equals," as determined by City.
3. Other types of equipment and kinds of material may be acceptable substitutions under the following conditions:
   a. Or-equals are unavailable due to strike, discontinued production of products meeting specified requirements, or other factors beyond control of Contractor; or,

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b. Contractor proposes a cost and/or time reduction incentive to the City.

1.5 SUBMITTALS

A. See Request for Substitution Form (attached)

B. Procedure for Requesting Substitution

1. Substitution shall be considered only:
   a. After award of Contract
   b. Under the conditions stated herein
2. Submit one PDF copy via email to the Project Manager and their duly appointed representative, including:
   a. Documentation
      1) Complete data substantiating compliance of proposed substitution with Contract Documents
      2) Data relating to changes in construction schedule, when a reduction is proposed
      3) Data relating to changes in cost
   b. For products
      1) Product identification
         a) Manufacturer's name
         b) Telephone number and representative contact name
         c) Specification Section or Drawing reference of originally specified product, including discrete name or tag number assigned to original product in the Contract Documents
      2) Manufacturer's literature clearly marked to show compliance of proposed product with Contract Documents
      3) Itemized comparison of original and proposed product addressing product characteristics including, but not necessarily limited to:
         a) Size
         b) Composition or materials of construction
         c) Weight
         d) Electrical or mechanical requirements
      4) Product experience
         a) Location of past projects utilizing product
         b) Name and telephone number of persons associated with referenced projects knowledgeable concerning proposed product
         c) Available field data and reports associated with proposed product
      5) Samples
         a) Provide at request of City.
         b) Samples become the property of the City.
   c. For construction methods:
      1) Detailed description of proposed method
      2) Illustration drawings

C. Approval or Rejection

1. Written approval or rejection of substitution given by the City
2. City reserves the right to require proposed product to comply with color and pattern of specified product if necessary to secure design intent.
3. In the event the substitution is approved, the resulting cost and/or time reduction will be documented by Change Order in accordance with the General Conditions.

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4. No additional contract time will be given for substitution.
5. Substitution will be rejected if:
   a. Submittal is not through the Contractor with his stamp of approval
   b. Request is not made in accordance with this Specification Section
   c. In the City's opinion, acceptance will require substantial revision of the original design
   d. In the City's opinion, substitution will not perform adequately the function consistent with the design intent

1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS [NOT USED]

1.7 CLOSEOUT SUBMITTALS [NOT USED]

1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]

1.9 QUALITY ASSURANCE

A. In making request for substitution or in using an approved product, the Contractor represents that the Contractor:
   1. Has investigated proposed product, and has determined that it is adequate or superior in all respects to that specified, and that it will perform function for which it is intended
   2. Will provide same guarantee for substitute item as for product specified
   3. Will coordinate installation of accepted substitution into Work, to include building modifications if necessary, making such changes as may be required for Work to be complete in all respects
   4. Waives all claims for additional costs related to substitution which subsequently arise

1.10 DELIVERY, STORAGE, AND HANDLING [NOT USED]

1.11 FIELD [SITE] CONDITIONS [NOT USED]

1.12 WARRANTY [NOT USED]

PART 2 - PRODUCTS [NOT USED]

PART 3 - EXECUTION [NOT USED]

END OF SECTION

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EXHIBIT A
REQUEST FOR SUBSTITUTION FORM:

TO:_____

PROJECT:_____ DATE:_____

We hereby submit for your consideration the following product instead of the specified item for the above project:

SECTION PARAGRAPH SPECIFIED ITEM

_____

Proposed Substitution: _____

Reason for Substitution: _____

Include complete information on changes to Drawings and/or Specifications which proposed substitution will require for its proper installation.

Fill in Blanks Below:

A. Will the undersigned contractor pay for changes to the building design, including engineering and detailing costs caused by the requested substitution?

_____

B. What effect does substitution have on other trades?

_____

C. Differences between proposed substitution and specified item?

_____

D. Differences in product cost or product delivery time?

_____

E. Manufacturer's guarantees of the proposed and specified items are:

_____ Equal _____Better (explain on attachment)

The undersigned states that the function, appearance and quality are equivalent or superior to the specified item.

Submitted By:

Signature_____
as noted

Firm_____
Address_____

Date_____
Telephone _____

For Use by City

___Recommended ___Recommended

___Not recommended____Received late
By _____
Date _____
Remarks _____
_____
_____

For Use by City:

_____Approved _____Rejected
City_____ Date _____

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SECTION 01 31 19
PRECONSTRUCTION MEETING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Provisions for the preconstruction meeting to be held prior to the start of Work to clarify construction contract administration procedures

B. Deviations from this City of Denton Standard Specification
   1. None.

C. Related Specification Sections include, but are not necessarily limited to:
   1. Division 0 – Bidding Requirements, Contract Forms and Conditions of the Contract
   2. Division 1 – General Requirements

1.2 PRICE AND PAYMENT PROCEDURES

A. Measurement and Payment
   1. Work associated with this Item is considered incidental to the various items bid. No separate payment will be allowed for this Item.

1.3 REFERENCES [NOT USED]

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination
   1. Attend preconstruction meeting.
   2. Representatives of Contractor, subcontractors and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.
   3. Meeting administered by City may be tape recorded.
      a. If recorded, tapes will be used to prepare minutes and retained by City for future reference.
   4. Project Manager will establish their duly authorized representative(s) authorized to make decisions as identified in the Contract Documents.

B. Preconstruction Meeting
   1. A preconstruction meeting will be held within 14 days after the execution of the Agreement and before Work is started.
      a. The meeting will be scheduled and administered by the City.
   2. The Project Manager will preside at the meeting, prepare the notes of the meeting and distribute copies of same to all participants who so request by fully completing the attendance form to be circulated at the beginning of the meeting.
   3. Attendance shall include:
      a. Project Manager
      b. Project Manager's duly authorized representative (if any)
      c. Contractor's project manager

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d. Contractor's superintendent
e. Any subcontractor or supplier representatives whom the Contractor may desire to invite or the City may request
f. Other City representatives
g. Others as appropriate

4. Construction Schedule
   a. Prepare baseline construction schedule in accordance with Section 01 32 16 and provide at Preconstruction Meeting.
   b. City will notify Contractor of any schedule changes upon Notice of Preconstruction Meeting.

5. Preliminary Agenda may include:
   a. Introduction of Project Personnel
   b. General Description of Project
   c. Status of right-of-way, utility clearances, easements or other pertinent permits
   d. Contractor's work plan and schedule
   e. Contract Time
   f. Notice to Proceed
   g. Construction Staking
   h. Progress Payments
   i. Additional work and Change Order Procedures
   j. Construction Change Directive
   k. Disposal Site Letter for Waste Material
   l. Insurance Renewals
   m. Payroll Certification
   n. Material Certifications and Quality Control Testing
   o. Public Safety and Convenience
   p. Documentation of Pre-Construction Conditions
   q. Weekend Work Notification
   r. Legal Holidays
   s. Trench Safety Plans
   t. Confined Space Entry Standards
   u. Coordination with the City's representative for operations of existing water systems
   v. Storm Water Pollution Prevention Plan
   w. Coordination with other contractors
   x. Early Warning System
   y. Contractor Evaluation
   z. Special Conditions applicable to the project
   aa. Damages Claims
   bb. Submittal Procedures
   cc. Substitution Procedures
   dd. Correspondence Routing
   ee. Record Drawings
   ff. Temporary construction facilities
   gg. Final Acceptance
   hh. Final Payment
   ii. Communications Plan
   jj. Questions or Comments

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1.5 SUBMITTALS [NOT USED]

1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS [NOT USED]

1.7 CLOSEOUT SUBMITTALS [NOT USED]

1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]

1.9 QUALITY ASSURANCE [NOT USED]

1.10 DELIVERY, STORAGE, AND HANDLING [NOT USED]

1.11 FIELD [SITE] CONDITIONS [NOT USED]

1.12 WARRANTY [NOT USED]

PART 2 - PRODUCTS [NOT USED]

PART 3 - EXECUTION [NOT USED]

END OF SECTION

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SECTION 01 31 20
PROJECT MEETINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Provisions for project meetings throughout the construction period to enable orderly review of the progress of the Work and to provide for systematic discussion of potential problems

B. Deviations this City of Denton Standard Specification

1. None.

C. Related Specification Sections include, but are not necessarily limited to:

1. Division 0 – Bidding Requirements, Contract Forms and Conditions of the Contract
2. Division 1 – General Requirements

1.2 PRICE AND PAYMENT PROCEDURES

A. Measurement and Payment

1. Work associated with this Item is considered incidental to the various items bid. No separate payment will be allowed for this Item.

1.3 REFERENCES [NOT USED]

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination

1. Schedule, attend and administer as specified, periodic progress meetings, and specially called meetings throughout progress of the Work.
2. Representatives of Contractor, subcontractors and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.
3. Meetings administered by City may be recorded.
4. Meetings, in addition to those specified in this Section, may be held when requested by the City, Engineer or Contractor.

B. Progress Meetings

1. Formal project coordination meetings will be held <Insert anticipated frequency, i.e. weekly, monthly, etc.>. Meetings will be scheduled and administered by Project Manager.
   a. Additional meetings may be held at the request of the:
      1) City
      2) Engineer
      3) Contractor
2. Additional progress meetings to discuss specific topics will be conducted on an as-needed basis. Such additional meetings shall include, but not be limited to:
   a. Coordinating shutdowns

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b. Installation of piping and equipment
c. Coordination between other construction projects
d. Resolution of construction issues
e. Equipment approval

3. The Project Manager will preside at progress meetings, prepare the notes of the meeting and distribute copies of the same to all participants who so request by fully completing the attendance form to be circulated at the beginning of each meeting.
4. Attendance shall include:
a. Contractor's project manager
b. Contractor's superintendent
c. Any subcontractor or supplier representatives whom the Contractor may desire to invite or the City may request
d. Engineer's representatives
e. City's representatives
f. Others, as requested by the Project Manager
5. Preliminary Agenda may include:
a. Review of Work progress since previous meeting
b. Field observations, problems, conflicts
c. Items which impede construction schedule
d. Review of off-site fabrication, delivery schedules
e. Review of construction interfacing and sequencing requirements with other construction contracts.
f. Corrective measures and procedures to regain projected schedule
g. Revisions to construction schedule
h. Progress, schedule, during succeeding Work period
i. Coordination of schedules
j. Review submittal schedules
k. Maintenance of quality standards
l. Pending changes and substitutions
m. Review proposed changes for:
1) Effect on construction schedule and on completion date
2) Effect on other contracts of the Project

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n. Review Record Documents
o. Review monthly pay request
p. Review status of Requests for Information

6. Meeting Location
   a. The City will establish a meeting location.
      1) To the extent practicable, meetings will be held at the Site.

1.5 SUBMITTALS [NOT USED]

1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS [NOT USED]

1.7 CLOSEOUT SUBMITTALS [NOT USED]

1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]

1.9 QUALITY ASSURANCE [NOT USED]

1.10 DELIVERY, STORAGE, AND HANDLING [NOT USED]

1.11 FIELD [SITE] CONDITIONS [NOT USED]

1.12 WARRANTY [NOT USED]

PART 2 - PRODUCTS [NOT USED]

PART 3 - EXECUTION [NOT USED]

END OF SECTION

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SECTION 01 33 00
SUBMITTALS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. General methods and requirements of submissions applicable to the following Work-related submittals:
   a. Shop Drawings
   b. Product Data (including Project Material Submittal Checklist submittals)
   c. Samples
   d. Mock Ups

B. Deviations from this City of Denton Standard Specification

1. None.

C. Related Specification Sections include, but are not necessarily limited to:

1. Division 0 – Bidding Requirements, Contract Forms and Conditions of the Contract
2. Division 1 – General Requirements

1.2 PRICE AND PAYMENT PROCEDURES

A. Measurement and Payment

1. Work associated with this Item is considered incidental to the various items bid. No separate payment will be allowed for this Item.

1.3 REFERENCES [NOT USED]

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination

1. Notify the City in writing, at the time of submittal, of any deviations in the submittals from the requirements of the Contract Documents.
2. Coordination of Submittal Times
   a. Prepare, prioritize and transmit each submittal sufficiently in advance of performing the related Work or other applicable activities, or within the time specified in the individual Work Sections, of the Specifications.
   b. Contractor is responsible such that the installation will not be delayed by processing times including, but not limited to:
      a) Disapproval and resubmittal (if required)
      b) Coordination with other submittals
      c) Testing
      d) Purchasing
      e) Fabrication
      f) Delivery
      g) Similar sequenced activities
   c. No extension of time will be authorized because of the Contractor's failure to transmit submittals sufficiently in advance of the Work.

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d. Make submittals promptly in accordance with approved schedule, and in such sequence as to cause no delay in the Work or in the work of any other contractor.

B. Submittal Numbering

1. When submitting shop drawings or samples, utilize a submittal cross-reference identification numbering system in the following manner:
   a. Use the applicable Specification Section Number.
   b. For the next 2 digits number use numbers 01-99 to sequentially number each initial separate item or drawing submitted under each specific Section number.
   c. Last use a letter, A-Z, indicating the resubmission of the same drawing (i.e. A=2nd submission, B=3rd submission, C=4th submission, etc.). A typical submittal number would be as follows:

303-02-B

1) 303 is the Specification Section for Portland Cement Concrete Pavement
2) 02 is the second initial submittal under this Specification Section
3) B is the third submission (second resubmission) of that particular shop drawing

C. Contractor Certification

1. Review shop drawings, product data and samples, including those by subcontractors, prior to submission to determine and verify the following:
   a. Field measurements
   b. Field construction criteria
   c. Catalog numbers and similar data
   d. Conformance with the Contract Documents
2. Provide each shop drawing, sample and product data submitted by the Contractor with a Certification Statement affixed including:
   a. The Contractor's Company name
   b. Signature of submittal reviewer
   c. Certification Statement
      1) "By this submittal, I hereby represent that I have determined and verified field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable approved shop drawings."

D. Submittal Format

1. Fold shop drawings larger than 8 ½ inches x 11 inches to 8 ½ inches x 11 inches.
2. Bind shop drawings and product data sheets together.
3. Order
   a. Cover Sheet
      1) Description of Packet
      2) Contractor Certification
   b. List of items / Table of Contents
   c. Product Data /Shop Drawings/Samples /Calculations

E. Submittal Content

1. The date of submission and the dates of any previous submissions

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2. The Project title and number
3. Contractor identification
4. The names of:
    a. Contractor
    b. Supplier
    c. Manufacturer
5. Identification of the product, with the Specification Section number, page and paragraph(s)
6. Field dimensions, clearly identified as such
7. Relation to adjacent or critical features of the Work or materials
8. Applicable standards, such as ASTM or Federal Specification numbers
9. Identification by highlighting of deviations from Contract Documents
10. Identification by highlighting of revisions on resubmittals
11. An 8-inch x 3-inch blank space for Contractor and City stamps

F. Shop Drawings

1. As specified in individual Work Sections includes, but is not necessarily limited to:
    a. Custom-prepared data such as fabrication and erection/installation (working) drawings
    b. Scheduled information
    c. Setting diagrams
    d. Actual shopwork manufacturing instructions
    e. Custom templates
    f. Special wiring diagrams
    g. Coordination drawings
    h. Individual system or equipment inspection and test reports including:
        1) Performance curves and certifications
    i. As applicable to the Work
2. Details
    a. Relation of the various parts to the main members and lines of the structure
    b. Where correct fabrication of the Work depends upon field measurements
        1) Provide such measurements and note on the drawings prior to submitting for approval.

G. Product Data

1. For submittals of product data for products included on the City's Product Material Submittal Checklist, highlight each item selected for use on the Project.
2. For submittals of product data for products <u>not</u> included on the City's Product Material Submittal Checklist, submittal data may include, but is not necessarily limited to:
    a. Standard prepared data for manufactured products (sometimes referred to as catalog data)
        1) Such as the manufacturer's product specification and installation instructions
        2) Availability of colors and patterns
        3) Manufacturer's printed statements of compliances and applicability
        4) Roughing-in diagrams and templates
        5) Catalog cuts

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6) Product photographs
7) Standard wiring diagrams
8) Printed performance curves and operational-range diagrams
9) Production or quality control inspection and test reports and certifications
10) Mill reports
11) Product operating and maintenance instructions and recommended spare-parts listing and printed product warranties
12) As applicable to the Work

3. Submittals of product data for products not included on the City's Product Material Submittal Checklist may be considered a Substitution in accordance with Section 01 25 00.

4. All deviations from City's Product Material Submittal Checklist shall require approval by the Engineer of Record for the Project.

H. Samples

1. As specified in individual Sections, include, but are not necessarily limited to:
   a. Physical examples of the Work such as:
      1) Sections of manufactured or fabricated Work
      2) Small cuts or containers of materials
      3) Complete units of repetitively used products color/texture/pattern swatches and range sets
      4) Specimens for coordination of visual effect
      5) Graphic symbols and units of Work to be used by the City for independent inspection and testing, as applicable to the Work

I. Do not start Work requiring a shop drawing, sample or product data nor any material to be fabricated or installed prior to the approval or qualified approval of such item.

1. Fabrication performed, materials purchased or on-site construction accomplished which does not conform to approved shop drawings and data is at the Contractor's risk.

2. The City will not be liable for any expense or delay due to corrections or remedies required to accomplish conformity.

3. Complete project Work, materials, fabrication, and installations in conformance with approved shop drawings, applicable samples, and product data.

J. Submittal Distribution

1. Electronic Distribution
   a. Provide all submittals in electronic form via email to Project Manager and their duly appointed representative.
   b. Shop Drawings
      1) Email submittal to Project Manager and their duly appointed representative.
      2) Hard Copies
         a) Not required
   c. Product Data
      1) Email submittal to Project Manager and their duly appointed representative.
      2) Hard Copies
         a) Not required
   d. Samples
      1) Distributed to the Project Manager

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K. Submittal Review

1. The review of shop drawings, data and samples will be for general conformance with the design concept and Contract Documents. This is not to be construed as:
   a. Permitting any departure from the Contract requirements
   b. Relieving the Contractor of responsibility for any errors, including details, dimensions, and materials
   c. Approving departures from details furnished by the City, except as otherwise provided herein
2. The review and approval of shop drawings, samples or product data by the City does not relieve the Contractor from his/her responsibility with regard to the fulfillment of the terms of the Contract.
   a. All risks of error and omission are assumed by the Contractor, and the City will have no responsibility therefore.
3. The Contractor remains responsible for details and accuracy, for coordinating the Work with all other associated work and trades, for selecting fabrication processes, for techniques of assembly and for performing Work in a safe manner.
4. If the shop drawings, data or samples as submitted describe variations and show a departure from the Contract requirements which City finds to be in the interest of the City and to be so minor as not to involve a change in Contract Price or time for performance, the City may return the reviewed drawings without noting an exception.
5. Submittals will be returned to the Contractor under 1 of the following codes:
   a. Code 1
      1) "NO EXCEPTIONS TAKEN" is assigned when there are no notations or comments on the submittal.
         a) When returned under this code the Contractor may release the equipment and/or material for manufacture.
   b. Code 2
      1) "EXCEPTIONS NOTED". This code is assigned when a confirmation of the notations and comments IS NOT required by the Contractor.
         a) The Contractor may release the equipment or material for manufacture; however, all notations and comments must be incorporated into the final product.
   c. Code 3
      1) "EXCEPTIONS NOTED/RESUBMIT". This combination of codes is assigned when notations and comments are extensive enough to require a resubmittal of the package.
         a) This resubmittal is to address all comments, omissions and non-conforming items that were noted.
         b) Resubmittal is to be received by the City within 15 Calendar Days of the date of the City's transmittal requiring the resubmittal.
   d. Code 4
      1) "NOT APPROVED" is assigned when the submittal does not meet the intent of the Contract Documents.
         a) The Contractor must resubmit the entire package revised to bring the submittal into conformance.
         b) It may be necessary to resubmit using a different manufacturer/vendor to meet the Contract Documents.

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6. Resubmittals
   a. Handled in the same manner as first submittals
      1) Corrections other than requested by the City
      2) Marked with revision triangle or other similar method
         a) At Contractor's risk if not marked
   b. Submittals for each item will be reviewed no more than twice at the City's expense.
      1) All subsequent reviews will be performed at times convenient to the City and at the Contractor's expense, based on the City's or City Representative's then prevailing rates.
      2) Provide Contractor reimbursement to the City within 30 Calendar Days for all such fees invoiced by the City.
   c. The need for more than 1 resubmission or any other delay in obtaining City's review of submittals, will not entitle the Contractor to an extension of Contract Time.
7. Partial Submittals
   a. City reserves the right to not review submittals deemed partial, at the City's discretion.
   b. Submittals deemed by the City to be not complete will be returned to the Contractor, and will be considered "Not Approved" until resubmitted.
   c. The City may at its option provide a list or mark the submittal directing the Contractor to the areas that are incomplete.
8. If the Contractor considers any correction indicated on the shop drawings to constitute a change to the Contract Documents, then written notice must be provided thereof to the City at least 7 Calendar Days prior to release for manufacture.
9. When the shop drawings have been completed to the satisfaction of the City, the Contractor may carry out the construction in accordance therewith and no further changes therein except upon written instructions from the City.
10. Each submittal, appropriately coded, will be returned within 30 Calendar Days following receipt of submittal by the City.

L. Mock ups
   1. Mock Up units as specified in individual Sections, include, but are not necessarily limited to, complete units of the standard of acceptance for that type of Work to be used on the Project. Remove at the completion of the Work or when directed.

M. Qualifications
   1. If specifically required in other Sections of these Specifications, submit a P.E. Certification for each item required.

N. Request for Information (RFI)
   1. Contractor Request for additional information
      a. Clarification or interpretation of the contract documents
      b. When the Contractor believes there is a conflict between Contract Documents
      c. When the Contractor believes there is a conflict between the Drawings and Specifications
         1) Identify the conflict and request clarification
      d. When the Contractor encounters an unknown condition in the field
   2. Use the Request for Information (RFI) form provided by the City (attached).

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3. Numbering of RFI
   a. Prefix with "RFI" followed by series number, "-xxx", beginning with "01" and increasing sequentially with each additional transmittal.
4. Sufficient information shall be attached to permit a written response without further information.
5. The City will log each request and will review the request.
   a. If review of the project information request indicates that a change to the Contract Documents is required, the City will issue a Field Order or Change Order, as appropriate.

1.5 SUBMITTALS [NOT USED]

1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS [NOT USED]

1.7 CLOSEOUT SUBMITTALS [NOT USED]

1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]

1.9 QUALITY ASSURANCE [NOT USED]

1.10 DELIVERY, STORAGE, AND HANDLING [NOT USED]

1.11 FIELD [SITE] CONDITIONS [NOT USED]

1.12 WARRANTY [NOT USED]

PART 2 - PRODUCTS [NOT USED]

PART 3 - EXECUTION [NOT USED]

END OF SECTION

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REQUEST FOR INFORMATION

Project:	**RFI #**:
Engineering Project No.:	**Date Sent**:
Sender:	**Receiver**:
Copies To:	

Subject:
Request:
Sender's Proposed Answer/Solution:

THE PROPOSED ANSWER/SOLUTION ☐ IS, ☐ IS NOT, INCLUDED IN THE CONTRACT.

Receiver's Response:

Response By:	**Company**:	**Date**:

DISTRIBUTION:

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SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Provide temporary facilities and controls needed for the Work including, but not necessarily limited to:
   a. Temporary utilities
   b. Sanitary facilities
   c. Storage Sheds and Buildings
   d. Dust control
   e. Temporary fencing of the construction site

B. Deviations from this City of Denton Standard Specification

1. None.

C. Related Specification Sections include, but are not necessarily limited to:

1. Division 0 – Bidding Requirements, Contract Forms and Conditions of the Contract
2. Division 1 – General Requirements

1.2 PRICE AND PAYMENT PROCEDURES

A. Measurement and Payment

1. Work associated with this Item is considered incidental to the various Items bid. No separate payment will be allowed for this Item.

1.3 REFERENCES [NOT USED]

1.4 ADMINISTRATIVE REQUIREMENTS

A. Temporary Utilities

1. Obtaining Temporary Service
   a. Make arrangements with utility service companies for temporary services.
   b. Abide by rules and regulations of utility service companies or authorities having jurisdiction.
   c. Be responsible for utility service costs until Work is approved for Final Acceptance.
      1) Included are fuel, power, light, heat and other utility services necessary for execution, completion, testing and initial operation of Work.
2. Construction Water
   a. Contractor to provide water required for and in connection with Work to be performed and for specified tests of piping, equipment, devices or other use as required for the completion of the Work.
   b. Provide and maintain adequate supply of potable water for domestic consumption by Contractor, if required.
   c. Coordination
      1) Contact City 1 week before water for construction is desired

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d. Metering and Payment for Construction Water
1) For water system improvements:
a) Obtain construction water meter from City to track water usage. Water will be provided at no cost to Contractor.
2) For all other projects:
a) Obtain construction water meter from City for payment as billed by City's established rates.

3. Electricity and Lighting
a. Provide and pay for electric powered service as required for Work, including testing of Work.
1) Provide power for lighting, operation of equipment, or other use.
b. Electric power service includes temporary power service or generator to maintain operations during scheduled shutdown.

4. Telephone
a. Provide emergency telephone service at Site for use by Contractor personnel and others performing work or furnishing services at Site.

5. Temporary Heat and Ventilation
a. Provide temporary heat as necessary for protection or completion of Work.
b. Provide temporary heat and ventilation to assure safe working conditions.

B. Sanitary Facilities
1. Provide and maintain sanitary facilities for persons on Site.
a. Comply with regulations of State and local departments of health.
2. Enforce use of sanitary facilities by construction personnel at job site.
a. Enclose and anchor sanitary facilities.
b. No discharge will be allowed from these facilities.
c. Collect and store sewage and waste so as not to cause nuisance or health problem.
d. Haul sewage and waste off-site at no less than weekly intervals and properly dispose in accordance with applicable regulation.
3. Locate facilities near Work Site and keep clean and maintained throughout Project.
4. Remove facilities at completion of Project

C. Storage Sheds and Buildings
1. Provide adequately ventilated, watertight, weatherproof storage facilities with floor above ground level for materials and equipment susceptible to weather damage.
2. Storage of materials not susceptible to weather damage may be on blocks off ground.
3. Store materials in a neat and orderly manner.
a. Place materials and equipment to permit easy access for identification, inspection and inventory.
4. Equip building with lockable doors and lighting, and provide electrical service for equipment space heaters and heating or ventilation as necessary to provide storage environments acceptable to specified manufacturers.
5. Fill and grade site for temporary structures to provide drainage away from temporary and existing buildings.
6. Remove building from site prior to Final Acceptance.

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D. Temporary Fencing

1. Provide and maintain for the duration or construction when required in contract documents

E. Dust Control

1. Contractor is responsible for maintaining dust control through the duration of the project.
   a. Contractor remains on-call at all times
   b. Must respond in a timely manner

F. Temporary Protection of Construction

1. Contractor or subcontractors are responsible for protecting Work from damage due to weather.

1.5 SUBMITTALS [NOT USED]

1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS [NOT USED]

1.7 CLOSEOUT SUBMITTALS [NOT USED]

1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]

1.9 QUALITY ASSURANCE [NOT USED]

1.10 DELIVERY, STORAGE, AND HANDLING [NOT USED]

1.11 FIELD [SITE] CONDITIONS [NOT USED]

1.12 WARRANTY [NOT USED]

PART 2 - PRODUCTS [NOT USED]

PART 3 - EXECUTION [NOT USED]

3.1 INSTALLERS [NOT USED]

3.2 EXAMINATION [NOT USED]

3.3 PREPARATION [NOT USED]

3.4 INSTALLATION

A. Temporary Facilities

1. Maintain all temporary facilities for duration of construction activities as needed.

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3.5 [REPAIR] / [RESTORATION]

3.6 RE-INSTALLATION

3.7 FIELD [OR] SITE QUALITY CONTROL [NOT USED]

3.8 SYSTEM STARTUP [NOT USED]

3.9 ADJUSTING [NOT USED]

3.10 CLEANING [NOT USED]

3.11 CLOSEOUT ACTIVITIES

A. Temporary Facilities

1. Remove all temporary facilities and restore area after completion of the Work, to a condition equal to or better than prior to start of Work.

3.12 PROTECTION [NOT USED]

3.13 MAINTENANCE [NOT USED]

3.14 ATTACHMENTS [NOT USED]

END OF SECTION

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SECTION 01 70 00
MOBILIZATION AND REMOBILIZATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Mobilization and Demobilization
   a. Mobilization
      1) Transportation of Contractor's personnel, equipment, and operating supplies to the Site
      2) Establishment of necessary general facilities for the Contractor's operation at the Site
      3) Premiums paid for performance and payment bonds
      4) Transportation of Contractor's personnel, equipment, and operating supplies to another location within the designated Site
      5) Relocation of necessary general facilities for the Contractor's operation from 1 location to another location on the Site.
   b. Demobilization
      1) Transportation of Contractor's personnel, equipment, and operating supplies away from the Site including disassembly
      2) Site Clean-up
      3) Removal of all buildings and/or other facilities assembled at the Site for this Contract
   c. Mobilization and Demobilization do not include activities for specific items of work that are for which payment is provided elsewhere in the contract.
2. Remobilization
   a. Remobilization for Suspension of Work specifically required in the Contract Documents or as required by City includes:
      1) Demobilization
         a) Transportation of Contractor's personnel, equipment, and operating supplies from the Site including disassembly or temporarily securing equipment, supplies, and other facilities as designated by the Contract Documents necessary to suspend the Work.
         b) Site Clean-up as designated in the Contract Documents
      2) Remobilization
         a) Transportation of Contractor's personnel, equipment, and operating supplies to the Site necessary to resume the Work.
         b) Establishment of necessary general facilities for the Contractor's operation at the Site necessary to resume the Work.
      3) No Payments will be made for:
         a) Mobilization and Demobilization from one location to another on the Site in the normal progress of performing the Work.
         b) Stand-by or idle time
         c) Lost profits

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B. Deviations from this City of Denton Standard Specification

1. None.

C. Related Specification Sections include, but are not necessarily limited to:

1. Division 0 – Bidding Requirements, Contract Forms and Conditions of the Contract
2. Division 1 – General Requirements

1.2 PRICE AND PAYMENT PROCEDURES

A. Measurement and Payment

1. Mobilization and Demobilization
   a. Measurement
      1) This Item will be measured by the lump sum as the work progresses.
   b. Payment
      1) For this Item, the adjusted Contract amount will be calculated as the total Contract amount less the lump sum for mobilization. Mobilization shall be made in partial payments as follows:
         a) When 1% of the adjusted Contract amount for construction Items is earned, 25% of the mobilization lump sum bid will be paid.
         b) When 25% of the adjusted Contract amount for construction Items is earned, 50% of the mobilization lump sum bid will be paid. Previous payments under the Item will be deducted from this amount.
         c) When 50% of the adjusted Contract amount for construction Items is earned, 75% of the mobilization lump sum bid will be paid. Previous payments under the Item will be deducted from this amount.
         d) When 75% of the adjusted Contract amount for construction Items is earned, 100% of the mobilization lump sum bid will be paid. Previous payments under the Item will be deducted from this amount.
         e) A bid containing a total for "Mobilization" in excess of 10% of total contract shall be considered unbalanced and a cause for consideration of rejection.
   c. The price bid shall include:
      1) Mobilization of equipment to Site
      2) Performance Bond
      3) Payment Bond
      4) Maintenance Bond
      5) Remobilization as identified in the Contract Documents
      6) Demobilization
   d. No payments will be made for standby, idle time, or lost profits associated this Item.
2. Remobilization for suspension of Work not identified in the Contract Documents, as required by City
   a. Measurement and Payment
      1) This shall be submitted as a Contract Claim in accordance with Article 11 of Section 00 72 00.
      2) No payments will be made for standby, idle time, or lost profits associated with this Item.

1.3 REFERENCES [NOT USED]

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1.4 ADMINISTRATIVE REQUIREMENTS [NOT USED]

1.5 SUBMITTALS [NOT USED]

1.6 INFORMATIONAL SUBMITTALS [NOT USED]

1.7 CLOSEOUT SUBMITTALS [NOT USED]

1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]

1.9 QUALITY ASSURANCE [NOT USED]

1.10 DELIVERY, STORAGE, AND HANDLING [NOT USED]

1.11 FIELD [SITE] CONDITIONS [NOT USED]

1.12 WARRANTY [NOT USED]

PART 2 - PRODUCTS [NOT USED]

PART 3 - EXECUTION [NOT USED]

END OF SECTION

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SECTION 01 71 23
CONSTRUCTION STAKING AND SURVEY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Requirements for construction staking to be provided by the Contractor.
2. Requirements for coordination with City to allow performance of as-built survey at the Site.

B. Deviations from this City of Denton Standard Specification

1. None

C. Related Specification Sections include, but are not necessarily limited to:

1. Division 0 – Bidding Requirements, Contract Forms and Conditions of the Contract
2. Division 1 – General Requirements

1.2 PRICE AND PAYMENT PROCEDURES

A. Measurement and Payment

1. Construction Staking
   a. Measurement and Payment
      1) Work associated with this Item is considered incidental to the various Items bid. No separate payment will be allowed for this Item.
2. As-Built Survey
   a. Measurement and Payment
      1) Work associated with this Item is considered incidental to the various Items bid. No separate payment will be allowed for this Item.

1.3 REFERENCES [NOT USED]

1.4 ADMINISTRATIVE REQUIREMENTS [NOT USED]

1.5 SUBMITTALS

A. Submittals, if required, shall be in accordance with Section 01 33 00.

B. All submittals shall be approved by the City prior to delivery.

1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS

A. Certificates

1. Provide certificate certifying that elevations and locations of improvements are in conformance or non-conformance with requirements of the Contract Documents.
   a. Certificate must be sealed by a registered professional land surveyor in the State of Texas.

B. Field Quality Control Submittals

1. Documentation verifying accuracy of field engineering work.

C. As-built Survey Submittal:

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1. AutoCAD (.dwg)
2. ESRI Shapefile (.shp)
3. CSV file (.csv), formatted with X and Y coordinates in separate columns
4. Include vertical and horizontal data tied to original project control and benchmarks, and feature descriptions

1.7 CLOSEOUT SUBMITTALS [NOT USED]

1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]

1.9 QUALITY ASSURANCE

A. Construction Staking

1. Construction staking will be performed by the Contractor.
2. Coordination
   a. It is the Contractor's responsibility to coordinate staking such that construction activities are not delayed or negatively impacted.
3. General
   a. Contractor is responsible for preserving and maintaining staking.
   b. If in the opinion of the City, a sufficient number of stakes or markings have been lost, destroyed or disturbed, by Contractor's neglect, such that the contracted Work cannot take place, then the Contractor will be required to re-stake the deficient areas.

B. As-built Survey

1. As-built Survey will be performed by the Contractor.
2. Coordination
   a. Contractor to verify that control data established in the design survey and required for construction remains intact.
   b. It is the Contractor's responsibility to coordinate As-built Survey such that construction activities are not delayed or negatively impacted.
   c. Contractor shall restore or replace all necessary control data damaged during construction operations.
   d. For sewer mains and water lines 12-inch and smaller in diameter, if permitted by City in writing, Contractor may physically measure depth and mark the location during the progress of construction and perform As-built Survey after the facility has been buried. The Contractor is responsible for the quality control required to ensure accuracy if this approach is permitted.
3. General
   a. As-built survey will be performed in order to maintain complete and accurate logs of control and survey work as it progresses for Project Records.
   b. The Contractor perform as-built survey to obtain construction features including, but not limited to, the following:
      1) All Utility Lines
         a) Rim and flowline elevations and coordinates for each manhole or junction structure
      2) Water Lines
         a) Top of pipe elevations and coordinates for water lines at the following locations:
            (1) Every 250 linear feet

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(2) Horizontal and vertical points of inflection, curvature, etc. (All Fittings)
(3) Cathodic protection test stations
(4) Sampling stations
(5) Meter boxes/vaults (All sizes)
(6) Fire lines
(7) Fire hydrants and valves
(8) Gate valves and Butterfly Valves
(9) Plugs, stubouts, dead-end lines
(10) Air Release valves (Manhole rim and vent pipe)
(11) Blow off valves (Manhole rim and valve lid)
(12) Pressure plane valves
(13) Cleaning wyes
(14) Casing pipe (each end)

b) Storm Sewer
(1) Top of pipe elevations and coordinates at the following locations:
(a) Every 250 linear feet
(b) Horizontal and vertical points of inflection, curvature, etc.

c) Sanitary Sewer
(1) Top of pipe elevations and coordinates for sanitary sewer lines at the following locations:
(a) Every 250 linear feet
(b) Horizontal and vertical points of inflection, curvature, etc.
(c) Cleanouts

c. As-built survey will be performed in order to maintain complete and accurate logs of control and survey work associated with meeting or exceeding the line and grade required by these Specifications.
1) The Contractor remains fully responsible for the accuracy of the work and the correction of it, as required.
2) Monitor line and grade continuously during construction.
3) Record deviation with respect to design line and grade once at each pipe joint and submit daily records to City.
4) If the installation does not meet the specified tolerances, immediately notify the City and correct the installation in accordance with the Contract Documents.

d. Submit to the City copies of field notes, if requested, used to establish all lines and grades and allow the City to check guidance system setup prior to beginning each tunneling drive.

1.10 DELIVERY, STORAGE, AND HANDLING [NOT USED]

1.11 FIELD [SITE] CONDITIONS [NOT USED]

1.12 WARRANTY [NOT USED]

PART 2 - PRODUCTS [NOT USED]

PART 3 - EXECUTION

3.1 INSTALLERS [NOT USED]

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3.2 EXAMINATION [NOT USED]

3.3 PREPARATION [NOT USED]

3.4 APPLICATION

3.5 REPAIR / RESTORATION [NOT USED]

3.6 RE-INSTALLATION [NOT USED]

3.7 FIELD [OR] SITE QUALITY CONTROL

A. It is the Contractor's responsibility to maintain all stakes and control data in accordance with this Specification.

B. Do not change or relocate stakes or control data without approval from the City.

3.8 SYSTEM STARTUP [NOT USED]

3.9 ADJUSTING [NOT USED]

3.10 CLEANING [NOT USED]

3.11 CLOSEOUT ACTIVITIES [NOT USED]

3.12 PROTECTION [NOT USED]

3.13 MAINTENANCE [NOT USED]

3.14 ATTACHMENTS [NOT USED]

END OF SECTION

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SECTION 01 74 23
CLEANING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Intermediate and final cleaning for Work not including special cleaning of closed systems specified elsewhere

B. Deviations from this City of Denton Standard Specification

1. None.

C. Related Specification Sections include, but are not necessarily limited to:

1. Division 0 – Bidding Requirements, Contract Forms and Conditions of the Contract
2. Division 1 – General Requirements

1.2 PRICE AND PAYMENT PROCEDURES

A. Measurement and Payment

1. Work associated with this Item is considered incidental to the various Items bid. No separate payment will be allowed for this Item.

1.3 REFERENCES [NOT USED]

1.4 ADMINISTRATIVE REQUIREMENTS

A. Scheduling

1. Schedule cleaning operations so that dust and other contaminants disturbed by cleaning process will not fall on newly painted surfaces.
2. Schedule final cleaning upon completion of Work and immediately prior to final inspection.

1.5 SUBMITTALS [NOT USED]

1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS [NOT USED]

1.7 CLOSEOUT SUBMITTALS [NOT USED]

1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]

1.9 QUALITY ASSURANCE [NOT USED]

1.10 STORAGE, AND HANDLING

A. Storage and Handling Requirements

1. Store cleaning products and cleaning wastes in containers specifically designed for those materials.

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1.11 FIELD [SITE] CONDITIONS [NOT USED]

1.12 WARRANTY [NOT USED]

PART 2 - PRODUCTS

2.1 OWNER-FURNISHED [OR] OWNER-SUPPLIEDPRODUCTS [NOT USED]

2.2 MATERIALS

A. Cleaning Agents
1. Compatible with surface being cleaned
2. New and uncontaminated
3. For manufactured surfaces
   a. Material recommended by manufacturer

2.3 ACCESSORIES [NOT USED]

2.4 SOURCE QUALITY CONTROL [NOT USED]

PART 3 - EXECUTION

3.1 INSTALLERS [NOT USED]

3.2 EXAMINATION [NOT USED]

3.3 PREPARATION [NOT USED]

3.4 APPLICATION [NOT USED]

3.5 REPAIR / RESTORATION [NOT USED]

3.6 RE-INSTALLATION [NOT USED]

3.7 FIELD [OR] SITE QUALITY CONTROL [NOT USED]

3.8 SYSTEM STARTUP [NOT USED]

3.9 ADJUSTING [NOT USED]

3.10 CLEANING

A. General
1. Prevent accumulation of wastes that create hazardous conditions.
2. Conduct cleaning and disposal operations to comply with laws and safety orders of governing authorities.
3. Do not dispose of volatile wastes such as mineral spirits, oil or paint thinner in storm or sanitary drains or sewers.
4. Dispose of degradable debris at an approved solid waste disposal site.
5. Dispose of nondegradable debris at an approved solid waste disposal site or in an alternate manner approved by City and regulatory agencies.

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6. Transport and deposit vegetative material removed as a result of work operations off-site at a legal site in accordance with all applicable federal, state, and local laws and regulations.
   a. Removed vegetation will not be allowed to remain in piles or mounds on the easement or surrounding property.
7. Handle materials in a controlled manner with as few handlings as possible.
8. Thoroughly clean, sweep, wash and polish all Work and equipment associated with this project.
9. Remove all signs of temporary construction and activities incidental to construction of required permanent Work.
10. If project is not cleaned to the satisfaction of the City, the City reserves the right to have the cleaning completed at the expense of the Contractor.
11. Do not burn on-site.

B. Intermediate Cleaning during Construction

1. Keep Work areas clean so as not to hinder health, safety or convenience of personnel in existing facility operations.
2. At maximum weekly intervals, dispose of waste materials, debris and rubbish.
3. Confine construction debris daily in strategically located container(s):
   a. Cover to prevent blowing by wind
   b. Store debris away from construction or operational activities
   c. Haul from site at a minimum of once per week
4. Vacuum clean interior areas when ready to receive finish painting.
   a. Continue vacuum cleaning on an as-needed basis, until Final Acceptance.
5. Prior to storm events, thoroughly clean site of all loose or unsecured items, which may become airborne or transported by flowing water during the storm.

C. Interior Final Cleaning

1. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels and other foreign materials from sight-exposed surfaces.
2. Wipe all lighting fixture reflectors, lenses, lamps and trims clean.
3. Wash and shine glazing and mirrors.
4. Polish glossy surfaces to a clear shine.
5. Ventilating systems
   a. Clean permanent filters and replace disposable filters if units were operated during construction.
   b. Clean ducts, blowers and coils if units were operated without filters during construction.
6. Replace all burned out lamps.
7. Broom clean process area floors.
8. Mop office and control room floors.

D. Exterior (Site or Right of Way) Final Cleaning

1. Remove trash and debris containers from site.
   a. Re-seed areas disturbed by location of trash and debris containers.
2. Sweep roadway to remove all rocks, pieces of asphalt, concrete or any other object that may hinder or disrupt the flow of traffic along the roadway.

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3. Clean any interior areas including, but not limited to, vaults, manholes, structures, junction boxes and inlets.
4. If no longer required for maintenance of erosion facilities, and upon approval by City, remove erosion control from site.
5. Clean signs, lights, signals, etc.

3.11 CLOSEOUT ACTIVITIES [NOT USED]

3.12 PROTECTION [NOT USED]

3.13 MAINTENANCE [NOT USED]

3.14 ATTACHMENTS [NOT USED]

END OF SECTION

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SECTION 01 77 19
CLOSEOUT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. The procedure for closing out a contract

B. Deviations from this City of Denton Standard Specification

1. None.

C. Related Specification Sections include, but are not necessarily limited to:

1. Division 0 – Bidding Requirements, Contract Forms and Conditions of the Contract
2. Division 1 – General Requirements
3. Section 33 01 30 – Post Construction Closed Circuit Television (CCTV) Inspection

1.2 PRICE AND PAYMENT PROCEDURES

A. Measurement and Payment

1. Work associated with this Item is considered incidental to the various Items bid. No separate payment will be allowed for this Item.

1.3 REFERENCES [NOT USED]

1.4 ADMINISTRATIVE REQUIREMENTS

A. Guarantees, Bonds and Affidavits

1. No application for final payment will be accepted until all guarantees, bonds, certificates, licenses and affidavits required for Work or equipment as specified are satisfactorily filed with the City.

B. Release of Liens or Claims

1. No application for final payment will be accepted until satisfactory evidence of release of liens has been submitted to the City.

1.5 SUBMITTALS

A. Submit all required documentation to Project Manager.

1.6 INFORMATIONAL SUBMITTALS [NOT USED]

1.7 CLOSEOUT SUBMITTALS [NOT USED]

PART 2 - PRODUCTS [NOT USED]

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PART 3 - EXECUTION

3.1 INSTALLERS [NOT USED]

3.2 EXAMINATION [NOT USED]

3.3 PREPARATION [NOT USED]

3.4 CLOSEOUT PROCEDURE

A. Prior to requesting Final Inspection, submit:

1. Project Record Documents in accordance with Section 01 78 39
2. Operation and Maintenance Data, if required, in accordance with Section 01 78 23

B. Prior to requesting Final Inspection, perform final cleaning in accordance with Section 01 74 23.

C. Final Inspection

1. After final cleaning, provide notice to the Project Manager and their duly appointed representative that the Work is completed.
   a. City reserves the right to deny request for Final Inspection if City determines that the entire Work is not sufficiently complete to warrant a Final Inspection
   b. The City will make an initial Final Inspection with the Contractor present.
   c. Upon completion of this inspection, the City will notify the Contractor, in writing within 10 business days, of any particulars in which this inspection reveals that the Work is defective or incomplete.
2. Upon receiving written notice from the City, immediately undertake the Work required to remedy deficiencies and complete the Work to the satisfaction of the City.
3. Upon completion of Work associated with the items listed in the City's written notice, inform the City, that the required Work has been completed. Upon receipt of this notice, the City, in the presence of the Contractor, will make a subsequent Final Inspection of the project.
4. Provide all special accessories required to place each item of equipment in full operation. These special accessory items include, but are not limited to:
   a. Specified spare parts
   b. Adequate oil and grease as required for the first lubrication of the equipment
   c. Initial fill up of all chemical tanks and fuel tanks
   d. Light bulbs
   e. Fuses
   f. Vault keys
   g. Handwheels
   h. Other expendable items as required for initial start-up and operation of all equipment

D. Supporting Documentation

1. Coordinate with the City Project Representative to complete the following additional forms:
   a. Final Payment Request
   b. Statement of Contract Time
   c. Affidavit of Payment and Release of Liens

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d. Consent of Surety to Final Payment

E. Letter of Final Acceptance

1. When City has deemed the Work has been completed, and upon receiving all Supporting Documentation, in accordance with General Conditions, City will issue Letter of Final Acceptance and release the final payment request for payment.

F. Warranty Inspection for Wastewater Mains

1. A second television inspection conforming to the standards laid out in Section 33 01 30 shall be started by the Contractor no sooner than 630 calendar days and finished no later than 690 calendar days after the date of issuance of the Letter of Final Acceptance for the project by the City of Denton.
2. The second inspection shall include a complete televised inspection of each manhole interior constructed or installed on the project (including cored manholes).
   a. Should the second inspection indicate repairs that need to be made, these will be performed by the Contractor at no cost to the City.
3. Failure of the Contractor to perform the second inspection or to make repairs indicated by the second inspection shall be sufficient grounds for the City to take action through the terms of the Maintenance Bond for the project to perform the second inspection and make any repairs indicated.

3.5 REPAIR / RESTORATION [NOT USED]

3.6 RE-INSTALLATION [NOT USED]

3.7 FIELD [OR] SITE QUALITY CONTROL [NOT USED]

3.8 SYSTEM STARTUP [NOT USED]

3.9 ADJUSTING [NOT USED]

3.10 CLEANING [NOT USED]

3.11 CLOSEOUT ACTIVITIES [NOT USED]

3.12 PROTECTION [NOT USED]

3.13 MAINTENANCE [NOT USED]

3.14 ATTACHMENTS [NOT USED]

END OF SECTION

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SECTION 01 78 23
OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Product data and related information appropriate for City's maintenance and operation of products furnished under Contract
2. Such products may include, but are not limited to:
   a. Traffic Controllers
   b. Irrigation Controllers (to be operated by the City)
   c. Butterfly Valves

B. Deviations from this City of Denton Standard Specification

1. None.

C. Related Specification Sections include, but are not necessarily limited to:

1. Division 0 – Bidding Requirements, Contract Forms and Conditions of the Contract
2. Division 1 – General Requirements

1.2 PRICE AND PAYMENT PROCEDURES

A. Measurement and Payment

1. Work associated with this Item is considered incidental to the various Items bid. No separate payment will be allowed for this Item.

1.3 REFERENCES [NOT USED]

1.4 ADMINISTRATIVE REQUIREMENTS

A. Schedule

1. Submit manuals in final form to the City within 30 calendar days of product shipment to the project site.

1.5 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00. All submittals shall be approved by the City prior to delivery.

1.6 INFORMATIONAL SUBMITTALS

A. Submittal Form

1. Prepare data in form of an instructional manual for use by City personnel.
2. Format
   a. Size: 8 ½ inches x 11 inches
   b. Paper
      1) 40 pound minimum, white, for typed pages
      2) Holes reinforced with plastic, cloth or metal
   c. Text: Manufacturer's printed data, or neatly typewritten

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d. Drawings
1) Provide reinforced punched binder tab, bind in with text
2) Reduce larger drawings and fold to size of text pages.
e. Provide fly-leaf for each separate product, or each piece of operating equipment.
1) Provide typed description of product, and major component parts of equipment.
2) Provide indexed tabs.
f. Cover
1) Identify each volume with typed or printed title "OPERATING AND MAINTENANCE INSTRUCTIONS".
2) List:
a) Title of Project
b) Identity of separate structure as applicable
c) Identity of general subject matter covered in the manual

3. Binders
a. Commercial quality 3-ring binders with durable and cleanable plastic covers
b. When multiple binders are used, correlate the data into related consistent groupings.

4. Provide an electronic form of the O&M Manual.

B. Manual Content

1. Neatly typewritten table of contents for each volume, arranged in systematic order
a. Contractor, name of responsible principal, address and telephone number
b. A list of each product required to be included, indexed to content of the volume
c. List, with each product:
1) The name, address and telephone number of the subcontractor or installer
2) A list of each product required to be included, indexed to content of the volume
3) Identify area of responsibility of each
4) Local source of supply for parts and replacement
d. Identify each product by product name and other identifying symbols as set forth in Contract Documents.

2. Product Data
a. Include only those sheets which are pertinent to the specific product.
b. Annotate each sheet to:
1) Clearly identify specific product or part installed
2) Clearly identify data applicable to installation
3) Delete references to inapplicable information

3. Drawings
a. Supplement product data with drawings as necessary to clearly illustrate:
1) Relations of component parts of equipment and systems
2) Control and flow diagrams
b. Coordinate drawings with information in Project Record Documents to assure correct illustration of completed installation.
c. Do not use Project Record Drawings as maintenance drawings.

4. Written text, as required to supplement product data for the particular installation:
a. Organize in consistent format under separate headings for different procedures.
b. Provide logical sequence of instructions of each procedure.

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5. Copy of each warranty, bond and service contract issued
   a. Provide information sheet for City personnel giving:
      1) Proper procedures in event of failure
      2) Instances which might affect validity of warranties or bonds

C. Manual for Materials and Finishes

1. Submit 5 hard copies and 1 digital copy of complete manual in final form.
2. Content, for architectural products, applied materials and finishes:
   a. Manufacturer's data, giving full information on products
      1) Catalog number, size, composition
      2) Color and texture designations
      3) Information required for reordering special manufactured products
   b. Instructions for care and maintenance
      1) Manufacturer's recommendation for types of cleaning agents and methods
      2) Cautions against cleaning agents and methods which are detrimental to product
      3) Recommended schedule for cleaning and maintenance
3. Content, for moisture protection and weather exposure products:
   a. Manufacturer's data, giving full information on products
      1) Applicable standards
      2) Chemical composition
      3) Details of installation
   b. Instructions for inspection, maintenance and repair

D. Manual for Equipment and Systems

1. Submit 5 hard copies and 1 digital copy of complete manual in final form.
2. Content, for each unit of equipment and system, as appropriate:
   a. Description of unit and component parts
      1) Function, normal operating characteristics and limiting conditions
      2) Performance curves, engineering data and tests
      3) Complete nomenclature and commercial number of replaceable parts
   b. Operating procedures
      1) Start-up, break-in, routine and normal operating instructions
      2) Regulation, control, stopping, shut-down and emergency instructions
      3) Summer and winter operating instructions
      4) Special operating instructions
   c. Maintenance procedures
      1) Routine operations
      2) Guide to "trouble shooting"
      3) Disassembly, repair and reassembly
      4) Alignment, adjusting and checking
   d. Servicing and lubrication schedule
      1) List of lubricants required
   e. Manufacturer's printed operating and maintenance instructions
   f. Description of sequence of operation by control manufacturer
      1) Predicted life of parts subject to wear
      2) Items recommended to be stocked as spare parts
   g. As installed control diagrams by controls manufacturer
   h. Each contractor's coordination drawings
      1) As installed color coded piping diagrams

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i. Charts of valve tag numbers, with location and function of each valve
j. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage
k. Other data as required under pertinent Sections of Specifications

3. Content, for each electric and electronic system, as appropriate:
   a. Description of system and component parts
      1) Function, normal operating characteristics, and limiting conditions
      2) Performance curves, engineering data and tests
      3) Complete nomenclature and commercial number of replaceable parts
   b. Circuit directories of panelboards
      1) Electrical service
      2) Controls
      3) Communications
   c. As installed color coded wiring diagrams
   d. Operating procedures
      1) Routine and normal operating instructions
      2) Sequences required
      3) Special operating instructions
   e. Maintenance procedures
      1) Routine operations
      2) Guide to "trouble shooting"
      3) Disassembly, repair and reassembly
      4) Adjustment and checking
   f. Manufacturer's printed operating and maintenance instructions
   g. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage
   h. Other data as required under pertinent Sections of Specifications
4. Prepare and include additional data when the need for such data becomes apparent during instruction of City's personnel.

1.7 CLOSEOUT SUBMITTALS [NOT USED]

1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]

1.9 QUALITY ASSURANCE

A. Provide operation and maintenance data by personnel with the following criteria:
   1. Trained and experienced in maintenance and operation of described products
   2. Skilled as technical writer to the extent required to communicate essential data
   3. Skilled as draftsman competent to prepare required drawings

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1 **1.10 DELIVERY, STORAGE, AND HANDLING [NOT USED]**

2 **1.11 FIELD [SITE] CONDITIONS [NOT USED]**

3 **1.12 WARRANTY [NOT USED]**

4 **PART 2 - PRODUCTS [NOT USED]**

5 **PART 3 - EXECUTION [NOT USED]**

6 **END OF SECTION**

7

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SECTION 01 78 39
PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Work associated with the documenting the project and recording changes to project documents, including:
   a. Record Drawings

B. Deviations from this City of Denton Standard Specification

1. None.

C. Related Specification Sections include, but are not necessarily limited to:

1. Division 0 – Bidding Requirements, Contract Forms and Conditions of the Contract
2. Division 1 – General Requirements

1.2 PRICE AND PAYMENT PROCEDURES

A. Measurement and Payment

1. Work associated with this Item is considered incidental to the various Items bid. No separate payment will be allowed for this Item.

1.3 REFERENCES [NOT USED]

1.4 ADMINISTRATIVE REQUIREMENTS [NOT USED]

1.5 SUBMITTALS

A. Prior to submitting a request for Final Inspection, deliver Project Record Documents to Project Manager.

1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS [NOT USED]

1.7 CLOSEOUT SUBMITTALS [NOT USED]

1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]

1.9 QUALITY ASSURANCE

A. Accuracy of Records

1. Thoroughly coordinate changes within the Record Documents, making adequate and proper entries on each page of Specifications and each sheet of Drawings and other Documents where such entry is required to show the change properly.
2. Accuracy of records shall be such that future search for items shown in the Contract Documents may rely reasonably on information obtained from the approved Project Record Documents.
3. To facilitate accuracy of records, make entries within 24 hours after receipt of information that the change has occurred.

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4. Provide factual information regarding all aspects of the Work, both concealed and visible, to enable future modification of the Work to proceed without lengthy and expensive site measurement, investigation and examination.

1.10 STORAGE AND HANDLING

A. Storage and Handling Requirements

1. Maintain the job set of Record Documents, which shall include the Drawings and the Project Manual, completely protected from deterioration and from loss and damage until completion of the Work and transfer of all recorded data to the final Project Record Documents.
2. In the event of loss of recorded data, use means necessary to again secure the data to the City's approval.
   a. In such case, provide replacements to the standards originally required by the Contract Documents.

1.11 FIELD [SITE] CONDITIONS [NOT USED]

1.12 WARRANTY [NOT USED]

PART 2 - PRODUCTS

2.1 OWNER-FURNISHED [OR] OWNER-SUPPLIED PRODUCTS [NOT USED]

2.2 RECORD DOCUMENTS

A. Job set

1. Promptly following receipt of the Notice to Proceed, secure from the City, at no charge to the Contractor, 1 complete set of all Documents comprising the Contract.

B. Final Record Documents

1. At a time nearing the completion of the Work and prior to Final Inspection, provide the City 1 complete set of all Final Record Drawings in the Contract.

2.3 ACCESSORIES [NOT USED]

2.4 SOURCE QUALITY CONTROL [NOT USED]

PART 3 - EXECUTION

3.1 INSTALLERS [NOT USED]

3.2 EXAMINATION [NOT USED]

3.3 PREPARATION [NOT USED]

3.4 MAINTENANCE DOCUMENTS

A. Maintenance of Job Set

1. Immediately upon receipt of the job set, identify each of the Documents with the title, "RECORD DOCUMENTS - JOB SET". The Job set shall include the Drawings and the Project Manual.

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2. Preservation
   a. Considering the Contract completion time, the probable number of occasions upon which the job set must be taken out for new entries and for examination, and the conditions under which these activities will be performed, devise a suitable method for protecting the job set.
   b. Do not use the job set for any purpose except entry of new data and for review by the City, until start of transfer of data to final Project Record Documents.
   c. Maintain the job set at the site of work.
3. Coordination with Construction Survey
   a. At a minimum, in accordance with the intervals set forth in Section 01 71 23, clearly mark any deviations from Contract Documents associated with installation of the infrastructure.
4. Making entries on Drawings and Specifications
   a. Record any deviations from Contract Documents on Drawings and in the Specifications if applicable.
   b. Use an erasable colored pencil (not ink or indelible pencil), clearly describe the change by graphic line and note as required.
   c. Date all entries.
   d. Call attention to the entry by a "cloud" drawn around the area or areas affected.
   e. In the event of overlapping changes, use different colors for the overlapping changes.
5. Conversion of schematic layouts
   a. In some cases on the Drawings, arrangements of conduits, circuits, piping, ducts, and similar items, are shown schematically and are not intended to portray precise physical layout.
      1) Final physical arrangement is determined by the Contractor, subject to the City's approval.
      2) However, design of future modifications of the facility may require accurate information as to the final physical layout of items which are shown only schematically on the Drawings.
   b. Show on the job set of Record Drawings, by dimension accurate to within 1 inch, the centerline of each run of items.
      1) Final physical arrangement is determined by the Contractor, subject to the City's approval.
      2) Show, by symbol or note, the vertical location of the Item ("under slab", "in ceiling plenum", "exposed", and the like).
      3) Make all identification sufficiently descriptive that it may be related reliably to the Specifications.
   c. The City may waive the requirements for conversion of schematic layouts where, in the City's judgment, conversion serves no useful purpose. However, do not rely upon waivers being issued except as specifically issued in writing by the City.

B. Final Project Record Documents
1. Transfer of data to Drawings and Specifications
   a. Carefully transfer change data shown on the job set of Record Drawings and Project Manual if applicable, to the corresponding final documents, coordinating the changes as required.

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b. Clearly indicate at each affected detail and other Drawing a full description of changes made during construction, and the actual location of items.
c. Call attention to each entry by drawing a "cloud" around the area or areas affected.
d. Make changes neatly, consistently and with the proper media to assure longevity and clear reproduction.
e. Provide GPS coordinates for all underground utility appurtenances, bends, fittings, valves, manholes, junction boxes or other structures. This requirement shall encompass all water, sanitary sewer, or drainage improvements.
f. Record Drawing documents shall be submitted in an electronic format (.pdf).

2. Transfer of data to other Documents
a. If the Documents, other than Drawings, have been kept clean during progress of the Work, and if entries thereon have been orderly to the approval of the City, the job set of those Documents, other than Drawings, will be accepted as final Record Documents.
b. If any such Document is not so approved by the City, secure a new copy of that Document from the City at the City's usual charge for reproduction and handling, and carefully transfer the change data to the new copy to the approval of the City.

3.5 REPAIR / RESTORATION [NOT USED]

3.6 RE-INSTALLATION [NOT USED]

3.7 FIELD [OR] SITE QUALITY CONTROL [NOT USED]

3.8 SYSTEM STARTUP [NOT USED]

3.9 ~~ADJUSTING [NOT USED]~~

3.10 CLEANING [NOT USED]

3.11 CLOSEOUT ACTIVITIES [NOT USED]

3.12 PROTECTION [NOT USED]

3.13 MAINTENANCE [NOT USED]

3.14 ATTACHMENTS [NOT USED]

END OF SECTION

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6/14/2024		Added GPS and electronic format requirements to Record Drawings under 3.4.B.

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SECTION 03 00 00
CONCRETE AND CONCRETE REINFORCING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Material requirements for concrete and concrete reinforcing.

B. Deviations from this City of Denton Standard Specification:
1. None.

C. Related Specification Sections include but are not limited to:
1. Division 0 - Bidding Requirements, Contract Forms, and Conditions of the Contract.
2. Division 1 - General Requirements.
3. Section 03 30 00 – Cast-in-Place Concrete
4. Section 03 80 00 – Modifications to Existing Concrete Structures
5. Section 31 37 00 – Riprap
6. Section 32 05 16 – Aggregates for Exterior Improvements
7. Section 32 13 13 – Concrete Paving
8. Section 32 13 16 – Decorative Concrete Paving
9. Section 32 16 00 – Curbs, Gutters, Sidewalks, and Driveways
10. Section 32 32 00 – Retaining Walls
11. Section 33 05 61 – Cast-in-Place Concrete Manholes
12. Section 33 42 11 – Stormwater Pipe and Boxes
13. Section 33 42 23 – Stormwater Headwalls, Wingwalls, and End Treatments
14. Section 33 42 30 – Stormwater Junction Boxes
15. Section 33 42 33 – Stormwater Curb Inlets and Area Drains
16. Section 41 14 00 – Batching Equipment

1.2 PRICE AND PAYMENT PROCEDURES

A. Measurement and Payment
1. Measurement
   a. Concrete and concrete reinforcing materials, equipment, tools, testing, and incidentals are subsidiary to the installation of various items.
2. Payment
   a. The work performed and materials furnished in accordance with this item are subsidiary to the unit prices bid for various items which require the use of concrete and concrete reinforcing, and will not be measured or paid for separately.

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1.3 REFERENCES

A. Reference Standards

1. Reference standards cited in this Section refer to the current reference standard published at the time of the latest revision date logged at the end of this Section unless a date is specifically cited.
2. American Concrete Institute (ACI):
   a. 211, Proportioning of Concrete Mixes
   b. 301, Specifications for Structural Concrete
   c. 318, Building Code Requirements for Structural Concrete
3. ASTM International (ASTM):
   a. A36, Standard Specification for Carbon Structural Steel
   b. A615, Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
   c. A675, Standard Specification for Steel Bars, Carbon, Hot-Wrought, Special Quality, Mechanical Properties
   d. A955, Standard Specification for Deformed and Plan Stainless Steel Bars for Concrete Reinforcement
   e. A996, Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement
   f. A1064, Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
   g. C33, Standard Specification for Concrete Aggregates
   h. C94, Standard Specification for Ready-Mixed Concrete
   i. C150, Standard Specification for Portland Cement
   j. C260, Standard Specification for Air-Entraining Admixtures for Concrete
   k. C494, Standard Specification for Chemical Admixtures for Concrete
   l. C595, Standard Specification for Blended Hydraulic Cements
   m. C1116, Standard Specification for Fiber-Reinforced Concrete
   n. C1399, Standard Test Method for Obtaining Average Residual-Strength of Fiber-Reinforced Concrete
4. Texas Department of Transportation (TxDOT) Departmental Material Specifications (DMS)
   a. DMS-4515, Multiple Piece Tie Bars for Concrete Pavements
   b. DMS-4550, Fibers for Concrete
   c. DMS-4600, Hydraulic Cement
   d. DMS-4610, Fly Ash
   e. DMS-4640, Chemical Admixtures for Concrete
   f. DMS-4650, Hydraulic Cement Concrete Curing Materials and Evaporation Retardants
   g. DMS-6100, Epoxies and Adhesives
5. TxDOT Test Procedures:
   a. Tex-401-A, Sieve Analysis of Fine and Coarse Aggregate
   b. Tex-409-A, Free Moisture and Water Absorption in Aggregate for Concrete
   c. Tex-470-A, Optimized Aggregate Gradation for Hydraulic Cement Concrete Mix Designs
   d. Tex-425-A, Determining Moisture Content in Fine Aggregate by the "Speedy" Moisture Method

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1.4 ADMINISTRATIVE REQUIREMENTS [NOT USED]

1.5 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00.

B. All submittals shall be approved by the City prior to delivery.

1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS

A. Shop Drawing

1. Concrete Mix Design – Submit a design of the concrete mix at least 4 weeks prior to the start of construction activities requiring concrete unless approved otherwise by the City. Provide the mix design in accordance with the class of concrete or concrete mix design specified in the Drawings including:
   a. Concrete Material Source Information
      1) Concrete supplier name
      2) Project name and address
      3) Contractor name
      4) Mixture Identification Number
   b. Design Requirements and Design Summary Including:
      1) The combined aggregate gradation, source, and material testing results in accordance with Section 32 05 16.
      2) Maximum slump
      3) Concrete intended use (sidewalk, roadway, etc) and class designation
      4) Design water to cement (w/c) ratio
      5) Design Target Strength
      6) 7-Day and 28-Day compressive strengths in accordance with ACI 301 and 318
      7) Batch weights, specific gravity, and type/class information for:
         a) Cement
         b) Supplementary cementing materials (if used)
         c) Coarse Aggregate
         d) Fine Aggregate
         e) Water
      8) Chemical admixtures – Type and amount used
      9) Product Data for all chemical admixtures, cement, and fly ash used.
   c. Statement from the concrete supplier verifying concrete has been tested and handled in accordance with ASTM C94.
2. Product Data
   a. Provide electronic product data from each manufacturer that is supplying curing compounds, evaporation retardant, joint fillers, or chemical additives to be used on the project.
   b. Product data sheets for all products other than epoxy to include:
      1) Manufacturer name
      2) Date
      3) Material description
      4) Point of delivery
      5) Data and test results as required in this Section

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6) Material Safety Data Sheets (if applicable, required for Epoxy and Curing Compounds)
7) Manufacturer Recommended Storing Data (if applicable)
8) Application Recommendations (if applicable)
9) Manufacturer's Recommended Storage and Handling instructions

c. Epoxy Product Data Sheet Additional Requirements:
1) Resin or hardener components
2) Brand name
3) Name of manufacturer
4) Lot or batch number
5) Temperature range for storage
6) Date of manufacture
7) Expiration date
8) Quantity contained

d. Fiber Reinforcing Submittal Requirements
1) Product data sheet
2) Letter of certification stating compliance with the requirements of this Section and other applicable standards.
3) Report that provides test results for Fiber Testing in accordance with DMS-4550, Fibers for Concrete
4) Delivery, storage, and handling instructions
5) Dosage requirements to provide concrete reinforcing in accordance with the requirements of this Section and any other applicable related Sections.
6) Installation and mixing instructions
7) Provide the City with test results in accordance with this Section and DMS-4550, Fibers for Concrete.

B. Informational Submittals
1. Source Locations
a. Provide the location of all material sources

1.7 CLOSEOUT SUBMITTALS [NOT USED]

1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]

1.9 QUALITY ASSURANCE [NOT USED]

1.10 DELIVERY, STORAGE, AND HANDLING

A. Storage and Handling Requirements
1. Secure and maintain a location to store the material in accordance with Section 01 66 00.

B. Storage and Stockpiling
1. Cement and Supplementary Cementitious Material (SCM)
a. Store all cement and SCM in weatherproof enclosures to protect them from dampness or absorption of moisture.
2. Steel Reinforcement
a. Store reinforcement above ground surface on skids, platforms, or other support.
b. Protect reinforcement from mechanical damage and surface deterioration caused by exposure to conditions that could cause rust.

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1.11 FIELD CONDITIONS [NOT USED]

1.12 WARRANTY [NOT USED]

PART 2 - PRODUCTS

2.1 CITY-SUPPLIED PRODUCTS [NOT USED]

2.2 MATERIALS

A. Concrete Production Materials

1. Cementitious Material
   a. Defined as the cement and supplementary cementing materials used in concrete.
   b. Cement
      1) Furnish cement Type I, II, or I/II in accordance with ASTM C150 Portland Cement or Type IL in accordance with ASTM C595.
      2) Provide cement from sources that are in accordance with DMS-4600 and listed on TxDOT's Material Producer List (MPL) entitled "Hydraulic Cement".
   c. Supplementary Cementing Materials (SCM)
      1) Fly Ash
         a) Refer to DMS – 4610 for types of Fly Ash
         b) Acceptable Fly Ash includes:
            (1) Class C and Class F
            (2) Ultra-Fine (UFFA)
            (3) Modified Class F (MFFA)
         c) Provide fly ash in accordance with DMS-4610 and from sources listed on TxDOT's MPL entitled "Fly Ash".
         d) Refer to Table 2 for Concrete Classes and Mix Design Options.
      2) Other SCMs
         a) No other SCM will be approved for use.
2. Water
   a. Provide mixing water and curing water free from oils, acids, organic matter, or other deleterious substances.
   b. Provide water from municipal supplies approved by the Texas Department of Health.
   c. Obtain approval from the City if using water not approved by the Texas Department of Health prior to construction.
      1) If approved to use water from a non-pre-approved source, water testing may be required. The City will request tests and provide minimum criteria.
3. Aggregate
   a. General
      1) Recycled crushed concrete pavement may be used as coarse or fine aggregate in Class A, B, E, and P concrete.
      2) A maximum of 20 percent of the fine aggregate may consist of recycled crushed concrete pavement.
   b. Fine aggregate
      1) In accordance with Section 32 05 16

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c. Coarse Aggregates

1) Provide coarse aggregate consisting of clean, tough, durable fragments in accordance with Section 32 05 16.

2) Provide coarse aggregates that meet the gradation shown in Table 1 when tested in accordance with Tex-401-A.

3) Select aggregate gradation based on the allowable grade for the appropriate concrete class shown in shown in Table 1.

Table 1
Coarse Aggregate Gradation Chart

Aggregate Grade No.[1]	Maximum Nominal Size	Percent Passing on Each Sieve								
		2–1/2"	2"	1–1/2"	1"	3/4"	1/2"	3/8"	#4	#8
1	2"	100	80–100	50–85		20–40			0–5	
2(467)	1-1/2"		100	95–100		35–70		10–30	0–5	
3	1-1/2"		100	95–100		60–90	25–60		0–5	
4 (57)	1"			100	95–100		25–60		0–10	0–5
5 (67)	3/4"				100	90–100		20–55	0–10	0–5
6 (7)	1/2"					100	90–100	40–70	0–15	0–5
7	3/8"						100	70–95	0–25	
8	3/8"						100	95–100	20–65	0–10

1. Corresponding ASTM C33 gradation shown in parentheses

4. Chemical Admixtures

a. General

1) Only water reducing and air-entraining admixtures are allowed.

2) Provide admixtures in accordance with DMS-4640, Chemical Admixtures for concrete.

3) Do not use Type C, E, F, or G admixtures in Class S bridge deck concrete.

4) Do not use chemical admixtures containing calcium chloride in any concrete.

b. Water Reducing Admixture

1) Provide water-reducing admixtures in accordance with ASTM C494. Types A, D, F, and G will be allowed.

a) ASTM C494, Types "A" and "F":

(1) Improves quality of concrete at lower cement content

(2) Increase slump without increasing water-cement ratio

b) ASTM C494, Types "D" and "G":

(1) Maintains workability during hot weather placement

c. Air-Entraining Admixture

1) Provide air-entraining admixtures in accordance with ASTM C260.

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2) Maintain a total air content between 3 and 7 percent.
3) Do not exceed the manufacturer's recommended dosage.

B. Concrete Placement Materials

1. Reinforcing Steel
   a. Provide type, size, grade, and quantity of steel reinforcement as specified in the Drawings.
   b. Provide Grade 60 or above steel bar reinforcing unless otherwise indicated in the Drawings.
   c. Provide reinforcement free from dirt, loose rust, painting, oil, or other foreign material.
   d. Provide corrosion protection if specified in the Drawings.
   e. Provide deformed reinforcing steel in accordance with one of the following:
      1) New Billet Steel in accordance with ASTM A615, Grades 60, 75, or 80
      2) Axle Steel in accordance with ASTM A996, Type A, Grade 60
         a) Provide as straight bars only and do not bend them.
      3) Rail Steel in accordance with ASTM A996 Type R, Grade 60.
         a) Rail steel only allowed in concrete pavement. Provide as straight bars only and do not bend them.
   f. Provide bars in accordance with the size and weight requirements for reinforcing in ASTM A615.
   g. Twisted bars are not considered deformed and will not be accepted by the City.
   h. Steel Wire Reinforcement will not be accepted by the City.
   i. Spiral Reinforcement
      1) Provide smooth or deformed wire conforming to ASTM A1064.
      2) Provide bars in accordance with ASTM A615, ASTM A996 Type A, or ASTM A675 Grade 80 meeting dimensional requirements of ASTM A615.
   j. Bending
      1) Bend all bars cold in a shape true to the shapes specified in the Drawings.
      2) Bend all bars used for stirrups and ties around a pin having a diameter at least two times the minimum thickness of the bar.
      3) Perform all other bends in accordance with the latest code of Standard Practice of Reinforcing Steel Institute.
      4) Bend stainless reinforcing steel in accordance with ASTM A955.
2. Fiber Reinforcing.
   a. General
      1) Fiber reinforcement is only allowed if specified on the Drawings by the Engineer of record with written approval from the City. Do not use for structures or roadway paving.
   b. Material
      1) Provide fibers in accordance with ASTM C1116, including alkali-proof, non-absorptive synthetic fibers, resistant to deterioration due to long-term exposure to moisture or substances present in admixtures, and do not contribute to nor interfere with the air entrainment of the concrete.
      2) Provide macrosynthetic fibers for reinforcing. Do not use natural, steel, glass, or any other type without prior approval by the City.

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3) Provide fibers that meet a minimum average residual strength of 115 psi when tested in accordance with ASTM C1399 with the following modifications:
a) Initial deflection for the initial crack of 0.02000 inches.
b) Sample tolerance of average residual strength not below 10 percent of the specified required value.

c. Length and Size
1) Provide fibers maximum 1.5 inches in length.

d. Testing
1) The use of fiber reinforcing does not change the strength or fresh concrete requirements per this specification.

e. Rejection
1) Any concrete installed with fiber reinforcing that is non-compliant with the requirements of this Section or other applicable related Sections will be removed and replaced at no cost to the City.

3. Tie Bars
a. Refer to pertinent Sections and City standard details for specific uses and installation requirements for Multiple Piece Tie Bars and Single Piece Tie Bars.
b. Install bars in accordance with the size, type, and location specified in the Drawings.
c. Provide straight deformed steel tie bars in accordance with ASTM A615.
d. Install tie bars per the size and spacing specified in the Drawings.
e. Do not bend or use bent tie bars. Tie bars should remain straight.
f. Multiple Piece Tie Bars
1) Provide multiple piece tie bars in accordance with DMS-4515, Multiple Piece Tie Bars for Concrete Pavements.

4. Dowel Bars
a. General
1) Install bars in accordance with the size, type, and location shown on the Drawings.
2) Refer to pertinent Sections and City standard details for uses and installation requirements.

b. Dowel Bars
1) Provide smooth, straight dowel bars free of burrs with a yield strength of at least 60 kilo-pound per square inch (ksi) as specified in the Drawings.
2) Provide steel in accordance with ASTM A615 or meet the physical requirements of ASTM A36 for smooth bars that are larger than 3/8 inch in diameter.
3) Coat dowels with a thin film of grease, wax, silicone, or other approved de-bonding material.
4) Designate smooth bars by diameter in inches.

c. Dowel Caps
1) Provide dowel caps on the lubricated end of each dowel bar used in an expansion joint.
2) Provide dowel caps filled with a soft compressible material with enough range of movement to allow complete closure of expansion joint.

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3) Provide dowel caps to the length specified in the Drawings. The cap should have sufficient length to allow at least a 1.25-inch gap between the end of the bar and the edge of the cap.
4) Provide caps for dowel bars with an internal diameter sufficient to permit the cap to freely slip over the bar, but do not have an internal diameter that exceeds the bar diameter by more 1/8 inch.

5. Reinforcement Supporting Devices
   a. Use reinforcement supporting devices for construction of sidewalks, driveways, roadways, crosswalks, and any other concrete paving operation.
   b. Provide positioning and supporting devices (baskets and chairs) capable of securing and holding the reinforcing steel in proper position before and during paving.
   c. Do not allow construction personnel to walk on the reinforcement bars. Replace any broken chairs prior to concrete placement.
   d. Provide supporting devices (baskets and chairs) made of plastic or non-rusting metal.
      1) Supporting devices to show no visible indications of deterioration after immersion in a 5-percent solution of sodium hydroxide for 120-hours.
      2) Provide the City with test results or product data sheets proving devices are in accordance with the requirements of this Section if requested.

6. Epoxy
   a. Provide Type 3, Class C epoxy in accordance with DMS-6100.
   b. City to approve all epoxy and adhesive products prior to use. Submit a Product Data Sheet in accordance with this Section.
   c. Do not use damaged or previously opened containers.
   d. Do not use any material showing evidence of crystallization, lumps, skinning, extreme thickening, or settling of pigments that cannot be readily dispersed with normal agitation.
   e. Follow sound environmental practices when disposing of epoxy and adhesive wastes.
   f. Dispose of all empty containers separately. Completely empty and mix the epoxy before disposal.

7. Evaporation Retardant
   a. Provide evaporation retardant in accordance with DMS-4650.

8. Curing
   a. The use of mats, plastic, or film to be approved by the City prior to use.
   b. Provide membrane curing compounds in accordance with this specification and DMS-4650.
      1) Provide curing material in accordance with the requirements of DMS-4650 unless otherwise specified in the Drawings or by the City.
      2) Provide a curing compound that does not react deleteriously with concrete or its compounds.
      3) Curing compound to produce a firm, continuous uniform moisture-impermeable film free from pinholes and adhere to surface of damp concrete.
      4) The City may reject any concrete not cured properly due to improperly applied curing compound or faulty materials.
      5) The City may reject the curing compound based on visual or odor defects.

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6) Curing compound to be delivered to the job site in the manufacturer's original containers only, with original label containing the following:
   a) Manufacturer's name
   b) Trade name of the material
   c) Batch number or symbol with which test samples may be correlated

C. Concrete Mix Design

1. General
   a. Furnish mix designs using ACI 211 or Tex-470-A.
   b. Maintain mix design and maximum water to cement ratio once mix design is approved by City.
   c. Do not place concrete until the mix design has been approved by the City. The City may require any concrete placed prior to approval to be removed and replaced at no cost to the City.
   d. Perform mix design proportioning by absolute volume method unless otherwise approved.
   e. Perform cement replacement using equivalent weight method unless otherwise approved.
   f. Do not exceed specified water to cement ratios listed in Table 2 for concrete classes when designing the mixture.
   g. Provide a mix design after the trial batch tests are complete in accordance with the requirements in this Section.

2. Cementitious Material
   a. Do not exceed 700 pounds of cementitious material per cubic yard of concrete unless otherwise specified or approved by the City.
   b. Use cement of the same type and from the same source for monolithic placements.

3. Concrete Classes
   a. General
      1) Provide concrete mix designs in accordance with the requirements shown in Table 2 for the class of concrete specified in the Drawings.
      2) Refer to the Drawings and the General Usage column on Table 2 for concrete class information.
      3) For concrete classes not specified in Table 2 refer to the Drawings or special project specifications for concrete mix design requirements.
   b. Class P Concrete
      1) Use air entraining admixture.
      2) Class P1 Concrete
         a) Use Class P1 concrete for machine paved concrete roadways and alleyways unless otherwise specified in the Drawings or directed by City.
      3) Class P2 Concrete
         a) Provide Class P2 concrete for hand poured concrete roadways, driveways, alleyways, and all other hand poured, vehicular trafficked concrete pavement unless otherwise specified in the Drawings.
   c. High Early Strength Concrete (HES)
      1) Use air entraining admixture.
      2) Provide HES concrete in accordance with the requirements of Table 2.
      3) Use HES concrete only when specified in the Drawings or when directed by City.

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4) HES may be approved for use when a roadway or driveway needs to be opened to traffic quickly.
5) Perform tests at 24 hours to verify compressive strength of HES concrete is minimum 3,200 psi.
6) Maximum coarse aggregate size is 1–1/2 inches.

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Table 2
Concrete Classes

Class of Concrete	Design Strength[1], Min f'c (psi)	Maximum Water to Cementitious Material Ratio	Coarse Aggregate Grades[2,3]	Cement Types	Mix Design Options	General Usage[4]
A	3,000	0.60	1 – 4, 8	I, II, I/II, IL	1 and 2	Sidewalks, sidewalk curbs, riprap, channel liners, flumes
B	2,000	0.60	2 – 7	I, II, I/II, IL		Traffic signal controller foundations, small roadside signs, anchors, blocking, utility pipe encasement
C[5]	3,600	0.45	1 – 6	I, II, I/II, IL	1 – 3	Culverts (except top slab of direct traffic culverts)
E	3,000	0.50	2 – 5	I, II, I/II, IL	1 – 3	Seal concrete
H[5]	Note 6	0.45	3 – 6	I, II, I/II, IL	1 – 3	Precast concrete
S[5]	4,000	0.45	2 – 5	I, II, I/II, IL	1 – 3	Top slabs of direct traffic culverts, approach slabs, headwalls, wingwalls, cast-in-place inlets, junction boxes and manholes
P1[8]	4,000	0.50	2 – 3	I, II, I/II, IL	1 – 3	Machine poured concrete pavement, monolithic curbs, non-monolithic curb and curb & gutter
P2[8]	4,500	0.45	2 – 3	I, II, I/II, IL	1 – 3	Hand poured concrete pavement, driveways, and decorative concrete pavement
HES[8]	4,500	0.45	2 – 3	I, II, I/II, IL	Note 7	Concrete pavement and concrete pavement repair

1. Design strength must be attained within 56 days.
2. Do not use Grade 1 coarse aggregate except in foundations with 4 inch minimum clear spacing between reinforcing steel bars unless otherwise specified on the Drawings or approved by the City. Do not use Grade 1 aggregate in drilled shafts.
3. Use Grade 8 aggregate in extruded curbs unless otherwise approved by the City or specified on the Drawings.
4. For information only.

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5. Structural concrete classes.
6. As shown on the Drawings or in the City Standard Details.
7. Mix design options do not apply. 700 pounds of cementitious material per cubic yard limit does not apply.
8. For machine poured concrete, use a minimum cementitious material content of 517 pounds per cubic yard. For hand poured concrete, use a minimum cementitious material content of 564 pounds per cubic yard.

4. Slump
   a. Provide concrete with a slump in accordance with Table 3 unless otherwise specified in the Drawings.
   b. Request approval to exceed the slump limits listed in Table 3 with the mix design submittal as part of the Action Submittal.
   c. Do not exceed maximum slump during production of the mix design or during concrete placement.
   d. Any concrete placed with a slump exceeding the limits shown in Table 3 will be rejected and removed and replaced at no cost to the City.

Table 3
Concrete Pavement Slump Requirements

Concrete Use[1]	Slump Range[2], Inch
Walls (over 9 inches thick), caps, columns, piers, approach slabs	3 – 5
Bridge slabs, top slabs of direct traffic culverts	3 – 5
Inlets, manholes, walls (less than 9 inches thick), bridge railing, culverts, concrete traffic barrier	4 – 6
Precast concrete	4 – 9
Underwater concrete placements	6 – 8
Drilled shafts, slurry displaced and underwater drilled shafts	Note 3
Machine Poured Paving (Class P1 Concrete)	1.5 – 3
Hand Poured Paving (Class P2 and HES Concrete)	3 – 5
Curb, gutter, curb and gutter, sidewalk, driveways, riprap, small roadside sign foundations, concrete pavement repair, concrete repair, concrete base material for trench repair.	1.5 – 4

1. For information only.
2. For fiber reinforced concrete, perform slump before addition of fibers.
3. As shown on the Drawings.

5. Mix Design Options
   a. **Option 1:** Replace cement with at least the minimum dosage listed in theFly Ash MPL for the fly ash used in the mixture. Do not replace more than 50% of the cement with fly ash.
   b. **Option 2:** Replace 35 to 50 percent of the cement with slag cement.
   c. **Option 3:** Replace 35 to 50 percent of the cement with a combination of fly ash, slag cement, MFA, metakaolin, or at least 3% silica fume; however, no more than 35% may be fly ash, and no more than 10% may be silica fume..

6. Trial Batch Production and Testing
   a. Trial Batch

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1) Produce a trial batch of the mix design in accordance with the requirements of the concrete class specified in the Drawings, using the same materials proposed for the project.
2) Perform testing and provide the results verifying the concrete mix design is in accordance with the requirements of this Section. Testing to include:
   a) Fresh concrete tests for air content and slump
   b) Strength testing at 7 days and 28 days
3) Do not modify the mix design after the City has approved it.
4) Submit a new mix design if a change is made to concrete supplier.

Table 4
Concrete Discharge Times

Fresh Concrete Temperature, Degrees Fahrenheit	Max Time After Batching for Concrete Not Containing Type B or D Admixtures, Minimum	Max Time After Batching for Concrete Containing Type B or D Admixtures[2], Minimum
90 and Above	45	75
Between 75 and 90	60	90
Below 75	90	120

1. Admixture Types are defined in DMS-4640
2. Concrete must contain at least the minimum manufacturer's recommended dosage of Type B or D admixture.
3. Batching can occur at a commercial concrete site or at a batch plant.

2.3 ACCESSORIES [NOT USED]

2.4 SOURCE QUALITY CONTROL

A. Concrete Mix Design and Verification

1. Any concrete installed using a non-conforming mix design is subject to removal and replacement at no cost to the City.

B. Concrete Production Acceptance

1. During production and placement of concrete, perform testing to verify the concrete is in accordance with the requirements in this Section for admixtures, mix design, slump, and compressive strength.

C. Concrete Placement Acceptance

1. General
   a. If concrete is suspected of having foreign material, City may reject at any time and the concrete may be removed and replaced at no cost to the City.
   b. Acceptance will be based on attaining the strength and the fresh concrete tests.
2. Placement Sampling
   a. Perform all fresh and hardened concrete testing at the frequency shown on Table 5.
   b. If any test comes back as non-conforming, stop production and placement of concrete until the reason has been determined and resolved.
   c. Any concrete that was placed is subject to further testing and removal and replacement at no cost to the City.

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Table 5
Testing Frequencies

Concrete Placements	Frequency
Bridge Deck Placements	Test the first 3 loads, then every 60 cubic yards or a fraction thereof specified by the City.
All Other Structural Class Concrete Placements	One test every 60 cubic yards or a fraction thereof per class per day as specified by the City
Non-Structural Class Concrete Placements	One test every 180 cubic yards or a fraction thereof as specified by the City

3. Testing of Fresh Concrete
   a. Sample and test fresh concrete for properties listed in Table 6.
   b. Take the sample at the time of discharge from the delivery truck.
   c. Concrete that is exhibiting segregation, excessive bleeding, or has a slump below the minimum allowed per concrete type (per Table 3) after addition of all water withheld will be rejected. Contractor will remove and replace at no cost to the City.

Table 6
Fresh Concrete Tests

Tests	Test Methods
Slump	Tex-415-A
Temperature	Tex-422-A
Air Content [1]	Tex-414-A, Tex-416-A, or ASTM C457

1. Only required when air-entraining admixtures are used.

4. Concrete Strength Test
   a. General
      1) Perform strength testing for all projects containing more than 60 cubic yards of concrete.
      2) Provide trained technicians during concrete paving to cast test cylinders in accordance with ASTM C31.
      3) Refer to Table 2 for required strength for each concrete class.
   b. Sampling
      1) Collect 6 test cylinders from a representative portion of concrete being placed for each test, with no less than two sets of cylinders taken from any one day's paving activities.
      2) After the cylinders have been cast by trained technicians, transport samples to the lab and test in accordance with ASTM C31 and ASTM C39. Provide test results to the City.
      3) Test the 6 cylinders per the following:
         a) 2 of the cylinders tested at 7 days,
         b) 2 cylinders tested at 28 days, and
         c) 2 cylinder held and tested at 56 days, if necessary.

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c. Acceptance
1) If the 28-day test results for the cylinders taken indicate deficient strength, the Contractor may, at their own expense, core the pavement in question and have the cores tested by another approved laboratory, in accordance with ASTM C42 and ACI 318 protocol.
2) Average of the 28-day test results of all cores within a designated area must meet 100 percent of the minimum specified strength.
3) If any individual cylinder or core results in less than 90 percent of design strength, additional cores will be taken to identify the limits of the non-compliant concrete at no cost to the City.
4) All concrete considered non-compliant will be removed and replaced at no cost to the City.

5. Cracked Concrete Acceptance Policy
a. If cracks greater than 0.025-inches exist in concrete pavement upon completion of the project and prior to the termination of the maintenance period, the City may require corrective action that could include removal and replacement at no cost to the City depending on the cause of the cracking.
b. Corrective Actions:
1) The City will determine whether the following options are viable. The City will evaluate each crack greater than 0.025-inches during the final inspection and prior to the end of the maintenance period.
2) Routing and Sealing:
a) Perform the routing and sealing work as directed by the Project Inspector, at no cost to the City, regardless of the cause of the cracking.
3) If routing and sealing is not a viable solution due to the cause of the cracking, or the size, remove and replace the concrete.
4) If the cause of the cracking is determined to be due to deficient subgrade, remove and replace the subgrade with flexible base or another approved subgrade within the limits of the deficient concrete.

6. Aggregate Moisture Testing
a. Perform testing and provide results in accordance with 32 05 16.
b. City may request this test to be performed at any time.

D. Non-Conforming Work
1. Concrete Mix Design and Production Materials
a. The City may reject the mix design if not in accordance with the requirements of this Section.
1) Any concrete installed using a non-conforming mix design will be subject to removal and replacement at no cost to the City.
b. If the trial batch fails to meet the requirements specified in this Section, the Contractor will produce test results for trial batches until the trial batch meets the requirements specified herein at no cost to the City.
c. The City may perform verification testing on all materials to verify the conformance of the mixture.

PART 3 - EXECUTION

3.1 INSTALLERS [NOT USED]

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3.2 EXAMINATION [NOT USED]

3.3 PREPARATION [NOT USED]

3.4 INSTALLATION

A. Batching Equipment

1. Batching equipment shall be in accordance with the requirements of Section 41 14 00.

B. Refer to the following Sections for all installation requirements:

1. Section 03 30 00 Cast-in-Place Concrete
2. Section 03 80 00 Modifications to Existing Concrete Structures
3. Section 31 37 00 for Riprap
4. Section 32 13 13 for Concrete Paving
5. Section 32 13 16 for Decorative Concrete Paving
6. Section 32 16 00 for Curbs, Gutters, Sidewalks, and Driveways
7. Section 32 32 00 for Retaining Walls
8. Section 33 05 61 for Cast-in-Place Concrete Manholes
9. Section 33 42 11 for Stormwater Pipe and Boxes
10. Section 33 42 23 for Stormwater Headwalls, Wingwalls, and End Treatments
11. Section 33 42 30 for Stormwater Junction Boxes
12. Section 33 42 33 for Stormwater Curb Inlets and Area Drains

3.5 REPAIR [NOT USED]

3.6 RE-INSTALLATION [NOT USED]

3.7 SITE QUALITY CONTROL [NOT USED]

3.8 SYSTEM STARTUP [NOT USED]

3.9 ADJUSTING [NOT USED]

3.10 CLEANING [NOT USED]

3.11 CLOSEOUT ACTIVITIES [NOT USED]

3.12 PROTECTION [NOT USED]

3.13 MAINTENANCE [NOT USED]

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3.14 ATTACHMENTS [NOT USED]

END OF SECTION

Revision Log		
DATE	NAME	SUMMARY OF CHANGE
6/25/2024		Added ASTM C595 reference
6/25/2024		Added Type IL cement to allowable cement in 2.2.A.1.b and subsequent locations
6/25/2024		Modified air entrainment ranges under 2.2.A.4.C.2
6/25/2024		Modified fiber reinforcement requirements; 2.2.B.2
6/25/2024		Modified Table 2 "Concrete Classes" to allow for Type IL cement, altered General Usage types, and removed Classes D and F from the table
6/25/2024		Modified Table 3 "Concrete Pavement Slump Requirements" to give greater slump ranges
6/25/2024		Modified mix design options for replacement of cement with various substitute products; 2.2.C.5
6/25/2024		Altered test cylinder requirements; 2.4.C.4

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SECTION 11 90 00
Other Equipment

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Mobile self-contained safety shower
2. Barrier arms and card readers

1.2 PRICE AND PAYMENT PROCEDURES

A. Measurement and Payment
1. Measurement
   a. Materials, equipment, tools, testing, and incidentals are subsidiary to the installation of structures or item being installed.
2. Payment
   a. The work performed and materials furnished in accordance with this item are subsidiary to the prices bid for shower/eyewash and barrier arms.

1.3 REFERENCES [NOT USED]

1.4 ADMINISTRATIVE REQUIREMENTS [NOT USED]

1.5 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00.

B. All submittals shall be approved by the City prior to delivery.

1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS

A. Shop Drawings
1. Mobile self-contained safety shower
2. Product Data
   a. Provide a product data sheet from each manufacturer.

B. Informational Submittals:
1. Source Locations
   a. Location of all material sources
2. Equipment Information
   a. Submittal for all major equipment including:
      1) Equipment name and description
      2) Size
      3) Intended use

1.7 CLOSEOUT SUBMITTALS [NOT USED]

1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]

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1.9 QUALITY ASSURANCE [NOT USED]

1.10 DELIVERY, STORAGE, AND HANDLING [NOT USED]

1.11 FIELD CONDITIONS [NOT USED]

1.12 WARRANTY [NOT USED]

PART 2 - PRODUCTS

2.1 CITY-SUPPLIED PRODUCTS [NOT USED]

2.2 MATERIALS

A. Mobile self-contained safety shower and eye wash as shown on drawings.

B. Barrier arms and card readers as shown on drawings.

2.3 ACCESSORIES [NOT USED]

2.4 SOURCE QUALITY CONTROL [NOT USED]

PART 3 - EXECUTION

3.1 INSTALLERS [NOT USED]

3.2 EXAMINATION [NOT USED]

3.3 INSTALLATION [NOT USED]

3.4 REPAIR

1. Any defect or damage to any of part of the mobile self-contained safety shower or it's related hardware shall be repaired to the manufacturer's specifications prior to installation.

3.5 RE-INSTALLATION [NOT USED]

3.6 SITE QUALITY CONTROL [NOT USED]

3.7 SYSTEM STARTUP [NOT USED]

3.8 ADJUSTING [NOT USED]

3.9 CLEANING [NOT USED]

3.10 CLOSEOUT ACTIVITIES [NOT USED]

3.11 PROTECTION [NOT USED]

3.12 MAINTENANCE [NOT USED]

3.13 ATTACHMENTS [NOT USED]

END OF SECTION

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SECTION 13 00 00
Special Construction

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Canvas structures including, but not limited to the following:
      a. Canvas material.
      b. Support and tensioning structures.
      c. Necessary connections and caps.

1.2 PRICE AND PAYMENT PROCEDURES

A. Measurement and Payment
   1. Measurement
      a. Materials, equipment, tools, testing, and incidentals are subsidiary to the installation of structures or item being installed.
   2. Payment
      a. The work performed and materials furnished in accordance with this item are subsidiary to the prices bid for building canvas.

1.3 REFERENCES [NOT USED]

1.4 ADMINISTRATIVE REQUIREMENTS [NOT USED]

1.5 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00.

B. All submittals shall be approved by the City prior to delivery.

1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS

A. Shop Drawings
   1. Canvas
   2. Product Data
      a. Provide a product data sheet from each manufacturer.

B. Informational Submittals:
   1. Source Locations
      a. Location of all material sources
   2. Equipment Information
      a. Submittal for all major equipment including:
         1) Equipment name and description
         2) Size
         3) Intended use

1.7 CLOSEOUT SUBMITTALS [NOT USED]

1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]

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1.9 QUALITY ASSURANCE [NOT USED]

1.10 DELIVERY, STORAGE, AND HANDLING [NOT USED]

1.11 FIELD CONDITIONS [NOT USED]

1.12 WARRANTY

A. The warranty from the installer shall be a 1-year workmanship warranty

B. The warranty from the canvas manufacturer shall be a 25-year material warranty.

PART 2 - PRODUCTS

2.1 CITY-SUPPLIED PRODUCTS [NOT USED]

2.2 MATERIALS

A. Manufacturer
   1. Manufacturer of the canvas shall be as follows unless otherwise approved.
      a. Norseman

B. Canvas
   1. Material shall be heavy duty, 13.8 oz white, Elite Non-FR HDPE
   2. Canvas shall cover a building of 60' x 120' using 6 roof panels and 2 end panels.
   3. 20' long PVC long extrusion caps shall be included as needed.
   4. 6' long no-sew wind straps shall be included as necessary.

2.3 ACCESSORIES

A. End tensioning packages
   1. PVC, rachets, cam buckles, etc. shall be included as per manufacturer's instructions.

2.4 SOURCE QUALITY CONTROL [NOT USED]

PART 3 - EXECUTION

3.1 INSTALLERS

A. Installers of the Canvas shall be as follows unless otherwise approved.
   1. The Autumn Breeze Group, Inc.

3.2 EXAMINATION [NOT USED]

3.3 PREPARATION

3.4 INSTALLATION

A. Canvas placement
   1. Canvas shall be placed as per the manufacturer's recommendation.

3.5 REPAIR

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1. Any defect or damage to the canvas or its related hardware shall be repaired to the manufacturer's specifications prior to installation.

3.6 RE-INSTALLATION [NOT USED]

3.7 SITE QUALITY CONTROL [NOT USED]

3.8 SYSTEM STARTUP [NOT USED]

3.9 ADJUSTING [NOT USED]

3.10 CLEANING [NOT USED]

3.11 CLOSEOUT ACTIVITIES [NOT USED]

3.12 PROTECTION [NOT USED]

3.13 MAINTENANCE [NOT USED]

3.14 ATTACHMENTS [NOT USED]

END OF SECTION

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SECTION 23 90 00
Ventilation Systems

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Ventilation structures including, but not limited to the following:
      a. Ventilation type.
         1) Exhaust fans.
         2) Louvered shutter vents.
         3) Passive roof vents
      b. Support structures.

1.2 PRICE AND PAYMENT PROCEDURES

A. Measurement and Payment
   1. Measurement
      a. Materials, equipment, tools, testing, and incidentals are subsidiary to the installation of structures or item being installed.
   2. Payment
      a. The work performed and materials furnished in accordance with this item are subsidiary to the prices bid for ventilation items.

1.3 REFERENCES [NOT USED}

1.4 ADMINISTRATIVE REQUIREMENTS [NOT USED]

1.5 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00.

B. All submittals shall be approved by the City prior to delivery.

1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS

A. Shop Drawings
   1. Exhaust fans, louvered shutter vents, and passive roof vents.
   2. Product Data
      a. Provide a product data sheet from each manufacturer.

B. Informational Submittals:
   1. Source Locations
      a. Location of all material sources
   2. Equipment Information
      a. Submittal for all major equipment including:
         1) Equipment name and description
         2) Size
         3) Intended use

1.7 CLOSEOUT SUBMITTALS [NOT USED]

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1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]

1.9 QUALITY ASSURANCE [NOT USED]

1.10 DELIVERY, STORAGE, AND HANDLING [NOT USED]

1.11 FIELD CONDITIONS [NOT USED]

1.12 WARRANTY [NOT USED]

PART 2 - PRODUCTS

2.1 CITY-SUPPLIED PRODUCTS [NOT USED]

2.2 MATERIALS

A. Exhaust Fans
   1. The Fans shall be single phase, variable speed, with 24" blades.
   2. Fans shall be made of aluminum and have aluminum framing.
   3. Fan motor shall have a totally enclosed ¼ HP air over motor, and rotate at a maximum of 1075 RPM, with a Maximum exhaust of 4163 CFM.

B. End Vents
   a. Single acting gravity end vents shall be 39" x 39" x 6 ¼" aluminum louvered shutter vents with static dampers and a maximum air velocity of 2500 FPM

C. Passive Roof Vents
   a. Vents shall be constructed of rugged polyethylene material, and made to block rain, snow, and inhibit bird nesting
   b. Vents shall be mounted on dual ridge purlins for support, and shall be 50 ½" long x 20 ¾" x 20" tall
   c. Vent capacity shall be 3000 CFM

2.3 ACCESSORIES [NOT USED]

2.4 SOURCE QUALITY CONTROL [NOT USED]

PART 3 - EXECUTION

3.1 INSTALLERS

Installers of the ventilation systems will be as follows unless otherwise approved:

1. The Autumn Breeze Group, Inc.

3.2 EXAMINATION [NOT USED]

3.3 INSTALLATION

A. Fans, Vents, and Passive Vents placement.
   1. Shall be placed as per the manufacturer's recommendation.

3.4 REPAIR

A. Defects or damages

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1. Any defect or damage to any of the Fans, Vents, and Passive Vents or their related hardware shall be repaired to the manufacturer's specifications prior to installation.

3.5 RE-INSTALLATION [NOT USED]

3.6 SITE QUALITY CONTROL [NOT USED]

3.7 SYSTEM STARTUP [NOT USED]

3.8 ADJUSTING [NOT USED]

3.9 CLEANING [NOT USED]

3.10 CLOSEOUT ACTIVITIES [NOT USED]

3.11 PROTECTION [NOT USED]

3.12 MAINTENANCE [NOT USED]

3.13 ATTACHMENTS [NOT USED]

END OF SECTION

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SECTION 26 05 00
COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. All labor, materials, and equipment required to install, test, and provide an operational electrical system as specified in the Drawings

B. Deviations from this City of Denton Standard Specification:

1. None.

C. Related Specification Sections include but are not limited to:

1. Division 0 - Bidding Requirements, Contract Forms, and Conditions of the Contract.
2. Division 1 - General Requirements.
3. Division 26 – Electrical.

1.2 PRICE AND PAYMENT PROCEDURES

A. Measurement and Payment

1. Furnish and Install Electrical Service
   a. Measurement
      1) Measured per each electrical service installed
   b. Payment
      1) The work performed and the materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid per each for "Furnish/Install Electrical Service" for:
         a) Various types.
         b) Various sizes.
   c. The price bid shall include:
      1) Furnishing and installing all the components of the electrical service as specified by the Drawings
      2) All necessary permits and fees and other costs
      3) Coordinating with the utility company for all work and materials provided by the utility company
      4) Poles
      5) Service supports
      6) Foundations
      7) Anchor bolts
      8) Riprap
      9) Enclosures
      10) Switches
      11) Breakers
      12) Service conduit
      13) Fittings

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14) Service conductors
15) Brackets
16) Bolts
17) Hangers
18) Hardware
19) Equipment, labor, tools, and incidentals
20) Excavation
21) Disposal of excess material
22) Haul off
23) Cleanup

2. Relocate Electrical Service
   a. Measurement
      1) Measured per each electrical service relocated.
   b. Payment
      1) The work performed and the materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid per each for "Relocate Electrical Service" for:
         a) Various types.
         b) Various sizes.
   c. The price bid shall include:
      1) Disconnecting and isolating the existing electrical service as specified in the Drawings
      2) Relocating the service supports
      3) New service support foundation
      4) Furnishing and compacting of backfill
      5) Paying all fees, permits, and other costs
      6) Coordination with the utility company for all work and materials provided by the utility company
      7) Removal and disconnection of equipment and materials
      8) Poles
      9) Service supports
      10) Foundations
      11) Anchor bolts
      12) Riprap
      13) Enclosures
      14) Switches
      15) Breakers
      16) Service conduit
      17) Fittings
      18) Service conductors
      19) Brackets
      20) Bolts
      21) Hangers
      22) Hardware
      23) Equipment, labor, tools, and incidentals
      24) Excavation
      25) Disposal of excess material
      26) Haul off
      27) Cleanup

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3. Remove Electrical Service
   a. Measurement
      1) Measured per each of the electrical service removed
   b. Payment
      1) The work performed and the materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid of each for "Remove Electrical Service" for:
         a) Various types.
         b) Various sizes.
   c. The price bid shall include:
      1) Coordination with the utility company to disconnect and isolate the electrical service
      2) Removing the service supports
      3) Furnishing and compaction of backfill
      4) Materials, equipment, labor, tools, and incidentals
      5)

1.3 REFERENCES

A. Reference Standards

1. Reference standards cited in this Section refer to the current reference standard published at the time of the latest revision date logged at the end of this Section unless a date is specifically cited.

1. Texas Department of Transportation (TxDOT), Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges:
   a. Item 441, "Steel Structures"
   b. Item 445, "Galvanizing"
   c. Item 449, "Anchor Bolts"
   d. Item 618, "Conduit"
   e. Item 620, "Electrical Conductors"
   f. Item 627, "Treated Timber Poles"
   g. Item 628, "Electrical Services"
   h. Item 656, "Foundations for Traffic Control Devices"
2. Texas Department of Transportation (TxDOT) Departmental Material Specifications (DMS):
   a. DMS-11080, "Electrical Services"
3. TxDOT Material Producer List (MPL)
4. National Electrical Manufacturers Association (NEMA)
5. National Electrical Code (NEC)
6. Underwriters Laboratories, Inc. (UL)
7. Canadian Electrical Code (CSA)

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination

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1. Where references are made to the Related Work paragraph in each Specification Section, referring to other Sections and other Divisions of the Specifications, the Contractor shall provide such information or Work as may be required in those references, and include such information or Work as may be specified.
2. Division 26 requirements apply to electrical work provided under any division of the Specifications.

B. Service and Metering

1. Obtain service from the electric service provider at 120/240 Volts, Single Phase, Three Wire, 60 Hz from transformer equipment furnished and installed by the power company.
2. Power company responsibilities:
   a. Furnishing and installing the primary overhead conductors and pole line
   b. Furnishing and installing the transformer or riser pole, primary cutouts, lightning arresters and grounding
   c. Furnishing and installing primary conduits and cables
   d. Furnishing and installing the transformer pad and grounding (if pad-mounted transformer)
   e. Furnishing and installing transformer
   f. Terminating underground primary cables
   g. Furnishing metering current transformers (CT's), meter and meter wiring
   h. Terminating secondary cables to the service transformer
   i. Furnishing meter base and enclosure
3. Contractor responsibilities:
   a. Furnishing and installing secondary conduits and cables
   b. Furnishing and installing power company approved metering current transformer enclosure (if required by power company)
   c. Installing meter base
   d. Furnishing and installing an empty conduit with pull line from the metering current transformer enclosure to the meter enclosure. Conduit size and type approved by the power company
   e. Coordinating electrical service installation with power company
4. City responsibilities:
   a. Negotiating with power company for the costs of new or revised services
   b. Making payment directly to power company for such costs

C. Codes, Inspections and Fees

1. Obtain all necessary permits and pay all fees required for permits and inspections.

1.5 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00.

B. All submittals shall be approved by the City prior to delivery.

1.6 ACTION SUBMITTALS [NOT USED]

1.7 CLOSEOUT SUBMITTALS [NOT USED]

1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]

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1.9 QUALITY ASSURANCE [NOT USED]

1.10 DELIVERY, STORAGE, AND HANDLING

A. Storage and Handling Requirements

1. Secure and maintain a location to store the material in accordance with Section 01 66 00.

1.11 FIELD CONDITIONS [NOT USED]

1.12 WARRANTY [NOT USED]

PART 2 - PRODUCTS

2.1 CITY-FURNISHED PRODUCTS [NOT USED]

2.2 MANUFACTURER / MATERIALS

A. Manufacturers

1. Provide material in accordance with TxDOT's Traffic Material Producer List: http://ftp.dot.state.tx.us/pub/txdot-info/cmd/mpl/qtrfsigeqp.pdf
   a. Manufacturers on this list shall be in accordance with this Section and related Sections.
2. Electrol Systems Meter Pedestal, Stainless Steel:
   a. TY D (120/240)070(NS)SS(E)PS(U), or
   b. Approved equal.
3. Substitution requests for manufacturers or models not indicated above shall be processed in accordance with Section 01 25 00.

B. Materials

1. Provide materials that comply with the details shown on the plans, the requirements of this Item, and the pertinent requirements of the following TxDOT specifications:
   a. Item 441
   b. Item 445
   c. Item 449
   d. Item 618
   e. Item 620
   f. Item 627
   g. Item 656
2. Provide new materials, except where specified in the Drawings to be reused.
3. For the installation of electrical services, use new materials that meet the requirements of the NEC, UL, CSA, and NEMA, and are in accordance with DMS-11080, "Electrical Services."
4. Provide prequalified electrical services prequalified from TxDOT's MPL. Notify the City in writing of selected materials from the MPL intended for use on each project.
5. Pedestal Service shall be custom made in accordance with the Contract Documents
   a. Supplied with 100 amp main breaker
   b. 1-50a/1p for traffic signal

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c. 1-20a/2p for lighting
d. 1-15a/1p for control circuit interior photo cell with windows
e. Hand-off-Auto Selector Switch
f. 200 amp meter socket

6. Pedestal service type shall be used unless otherwise approved by the City.
7. Pedestal service enclosure shall be aluminum and light green in color.

2.3 ACCESSORIES [NOT USED]

2.4 SOURCE QUALITY CONTROL [NOT USED]

PART 3 - EXECUTION

3.1 INSTALLERS [NOT USED]

3.2 EXAMINATION

A. Interpretation of Drawings
1. Coordinate the conduit installation with other trades and the actual supplied equipment.
2. Where circuits are shown as home runs: Provide fittings and boxes for complete raceway installation.
3. Verify exact locations and mounting heights of lighting fixtures, switches and receptacles prior to installation.

3.3 PREPARATION [NOT USED]

3.4 INSTALLATION

A. Installation
1. General
a. Perform work as specified in the Drawings an in accordance with the requirements of this Section.
b. Use established industry and utility safety practices when installing, relocating, or removing electrical services located near overhead or underground utilities.
1) Consult with the appropriate utility company before beginning work.
2. Installation
a. Furnish and install electrical service equipment.
b. Ensure components of the electrical service meet the requirements of the Contract Documents.
c. Follow NEC and local utility company requirements when installing the electrical equipment.
1) Coordinate the utility companies' work for providing service.
3. Relocation
a. Coordinate relocation with the appropriate utility company before beginning work.
b. Remove and reinstall existing electrical service in accordance with this Section.
1) Replace or add circuit breakers as specified in the Drawings.

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4. Removal
   a. Coordinate removal with the appropriate utility company before beginning work.
      1) Before the removal of the electrical service, disconnect and isolate any existing electrical service equipment in accordance with the utility company's requirements.
   b. Remove existing electrical service support a minimum of 2 feet below finished grade unless otherwise specified in the Drawings.
   c. Repair the remaining hole by backfilling with material equal in composition and density to the surrounding area.
   d. Replace any surfacing such as asphalt pavement or concrete riprap with like material to equivalent condition.
   e. Disconnect conductors and remove them from the conduit.
      1) Cut off all protruding conduit 6 inches below finished grade.
      2) Abandoned conduit need not be removed unless specified in the Drawings.
   f. Reconnect conductors and conduit to be reused when specified in the Drawings.
      1) Any necessary splices should be made in ground boxes, unless otherwise specified in the Drawings, and approved by City.
   g. Accept ownership of unsalvageable materials, and dispose of them in accordance with Federal, State, and local regulations.

B. Phase Balancing
   1. Connect circuits on motor control centers and panelboards to result in evenly balanced loads across all phases.

3.5 REPAIR [NOT USED]

3.6 RE-INSTALLATION [NOT USED]

3.7 FIELD QUALITY CONTROL [NOT USED]

3.8 SYSTEM STARTUP

A. Tests and Settings
   1. Test systems and equipment furnished under Division 26.
   2. Repair or replace all defective work as directed by City.
   3. Adjust the systems as specified and/or required in accordance with manufacturer and utility requirements.
   4. Prior to energizing electrical equipment, perform the following tests:
      a. Submit a sample test form or procedure.
      b. Submit test reports required by the utility comapny and data within 30 days after the test.
      c. Include names of all test personnel.
      d. Initial each test.
   5. Check wire and cable terminations for tightness.
   6. Verify all terminations at transformers, equipment, capacitor connections, panels, and enclosures by producing a 1-2-3 rotation on a phase sequence motor when connected to A, B, and C phases.

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7. Inspect, set, and test mechanical operation for circuit breakers, disconnect switches, motor starters, and control equipment.
8. Check interlocking, control, and instrument wiring for each system and/or part of a system to prove the system will function as specified in the Drawings.
9. Schedule and coordinate testing with the City a minimum of 2 weeks in advance.
10. Provide qualified test personnel, instruments, and test equipment.

3.9 ADJUSTING [NOT USED]

3.10 CLEANING [NOT USED]

3.11 CLOSEOUT ACTIVITIES [NOT USED]

3.12 PROTECTION [NOT USED]

3.13 MAINTENANCE [NOT USED]

3.14 ATTACHMENTS [NOT USED]

END OF SECTION

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SECTION 26 05 26
GROUNDING CONDUCTORS, GROUND RODS, AND POWER LEAD-IN CABLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Grounding Conductors.
2. Ground Rod.

B. Deviations from this City of Denton Standard Specification:
1. None.

C. Related Specification Sections include but are not limited to:
1. Division 0 - Bidding Requirements, Contract Forms, and Conditions of the Contract.
2. Division 1 - General Requirements.

1.2 PRICE AND PAYMENT PROCEDURES

A. Measurement and Payment
1. Grounding Conductors
   a. Measurement
      1) Measured per linear foot of grounding conductor installed.
   b. Payment
      1) The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" shall be paid for at the unit price bid per linear foot of "Bare Elec Conductor" installed for:
         a) Various types.
         b) Various sizes.
   c. The price bid shall include:
      1) Furnishing and installing Grounding Conductor as specified by the Drawings
2. Ground Rod
   a. Measurement
      1) This item is considered subsidiary to the various Traffic Signal Structures being installed.
   b. Payment
      1) The work performed and the materials furnished in accordance with this Item are subsidiary to various Traffic Signal Structures being installed and shall be subsidiary to the unit price bid per various Traffic Signal Structures being installed, no other compensation will be allowed.
3. Power Lead-in Cable
   a. Measurement
      1) Measured per linear foot of power lead-in cable installed.

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b. Payment
1) The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" shall be paid for at the unit price bid per linear foot of "Insulated Elec Conductor" installed for:
a) Various types.
b) Various sizes.
c. The price bid shall include:
1) Furnishing and installing Power Lead-in Cable as specified by the Drawings

1.3 REFERENCES

A. Abbreviations and Acronyms
1. AWG: American wire gauge
2. PVC: polyvinyl chloride
3. RHW: Rubber insulation, heat resistance of 75°C, water resistance
4. THHN: Thermoplastic, high heat resistance, nylon coated
5. A/C: alternating current

B. Reference Standards
1. Reference standards cited in this Section refer to the current reference standard published at the time of the latest revision date logged at the end of this Section unless a date is specifically cited.
2. Texas Department of Transportation (TxDOT), Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges:
a. Item 620, Electrical Conductors.
3. Texas Department of Transportation (TxDOT) Departmental Materials Specification:
a. DMS-11040, Electrical Conductors.
4. Federal Specification A-A-59544
5. American Society for Testing and Materials (ASTM):
a. ASTM B33, Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes.
b. ASTM B8, Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft.
6. International Municipal Signal Association (IMSA).
7. National Electric Code (NEC).

1.4 ADMINISTRATIVE REQUIREMENTS [NOT USED]

1.5 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00.

B. All submittals shall be approved by the City prior to delivery.

1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS

A. Product Data Sheets are required for:
1. Grounding conductor.

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2. Grounding rod.

1.7 CLOSEOUT SUBMITTALS [NOT USED]

1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]

1.9 QUALITY ASSURANCE [NOT USED]

1.10 DELIVERY, STORAGE, AND HANDLING

A. Storage and Handling Requirements
1. Secure and maintain a location to store the material in accordance with Section 01 66 00.

1.11 FIELD CONDITIONS [NOT USED]

1.12 WARRANTY [NOT USED]

PART 2 - PRODUCTS

2.1 CITY-FURNISHED PRODUCTS [NOT USED]

2.2 MATERIALS

A. Materials
1. Grounding Conductor
a. Grounding Conductor shall be in accordance with TxDOT DMS-11040.
b. The grounding conductor shall be a #6 AWG solid copper wire.
c. The conductor shall be bonded to all ground rods.
2. Ground Rod
a. Ground rod electrodes shall be copper-bonded steel being at least 5/8 inch in diameter.
b. All ground rods shall be a minimum of 8 feet, with a minimum of 6 feet buried.
3. Power lead-in cable
a. Power lead-in cable shall be stranded RHW copper wire and suitable for A/C electric service.
b. The cable shall be capable of operating at 600 volts maximum and suitable for use at conductor temperatures not exceeding 167 degrees Fahrenheit (75 degrees Celsius).
c. Material and construction shall be in accordance with the applicable requirements of IMSA and NEC standards.
d. Conductors shall be stranded, anneal coated copper.
e. Coated wire
1) Use copper wire in accordance with ASTM B33 before insulating or stranding.
f. Stranding shall be class B, in accordance with the latest edition of ASTM B8.
g. Insulation shall be THHN and comply with Federal Specification A-A-59544 and all applicable ASTM standards.

2.3 ACCESSORIES [NOT USED]

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2.4 SOURCE QUALITY CONTROL [NOT USED]

PART 3 - EXECUTION

3.1 INSTALLERS [NOT USED]

3.2 EXAMINATION [NOT USED]

3.3 PREPARATION [NOT USED]

3.4 INSTALLATION

A. Special Techniques

1. Ground Conductors
   a. Perform Work as specified in the Drawings.
2. Ground Rod
   a. Properly install and connect a ground rod for each controller cabinet, power drop, and signal pole pier to reduce any extraneous voltage to a safe level.
   b. The ground rod shall be located to minimize the length of the grounding-conductor run.
   c. For pole-mounted cabinets, a grounding rod and grounding conductor shall be installed at the nearest foundation or ground box.
   d. All grounding circuits shall be substantial, permanent, and electrically continuous with an ohms-to-ground resistance not to exceed 10 ohms when tested by volt-ohm-meter.
   e. Illumination poles shall use concrete-grounded electrodes.
   f. Grounding Connectors and Electrodes
      1) When the location precludes driving a single ground rod to a depth of 8 feet (2.4 m), or when a multiple ground rod matrix is used to obtain the required resistance to ground, ground rods shall be spaced at least 6 feet apart and bonded by a minimum No. 6 AWG copper wire.
      2) Connection of grounding circuits to grounding electrodes shall be by devices which will ensure a positive, fail-safe grip between the conductor and the electrode.
         a) No splice joint will be permitted in the grounding conductor.
      3) Each grounding rod shall be driven into the ground to a depth sufficient to provide the required resistance (10 ohms) between electrodes and ground.
3. Power Lead-in Cable
   a. Perform work as specified in the Drawings.

3.5 REPAIR [NOT USED]

3.6 RE-INSTALLATION [NOT USED]

3.7 FIELD QUALITY CONTROL [NOT USED]

3.8 SYSTEM STARTUP [NOT USED]

3.9 ADJUSTING [NOT USED]

3.10 CLEANING [NOT USED]

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3.11 CLOSEOUT ACTIVITIES [NOT USED]

3.12 PROTECTION [NOT USED]

3.13 MAINTENANCE [NOT USED]

3.14 ATTACHMENTS [NOT USED]

END OF SECTION

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SECTION 26 05 35
GROUND BOXES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Ground Boxes
2. Remove Ground Boxes

B. Deviations from this City of Denton Standard Specification:
1. None.

C. Related Specification Sections include but are not limited to:
1. Division 0 - Bidding Requirements, Contract Forms, and Conditions of the Contract.
2. Division 1 - General Requirements.
3. Section 26 05 33 – Raceway and Boxes.

1.2 PRICE AND PAYMENT PROCEDURES

A. Measurement and Payment
1. Furnish and Install Ground Boxes
a. Measurement
1) Measured per each ground box installed for:
a) Various sizes.
b) Various types.
b. Payment
1) The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid per each "Ground Box" installed for:
a) Various sizes.
b) Various types.
c. The price bid shall include:
a) Furnishing and installing Ground Boxes as specified in the Drawings
b) Excavation and backfill
c) Enclosures
d) Covers
e) Bolts
f) Gravel
g) Concrete apron, if required
2. Remove Ground Boxes
a. Measurement
1) Measured per each ground box removed for:
a) Various sizes.
b) Various types.

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b. Payment
1) The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid per each "Ground Box" removed for:
a) Various sizes.
b) Various types.
c. The price bid shall include:
1) Removing Ground Boxes as specified in the Drawings
2) Excavation and backfill

1.3 REFERENCES

A. Reference Standards
1. Reference standards cited in this Section refer to the current reference standard published at the time of the latest revision date logged at the end of this Section unless a date is specifically cited.
2. Texas Department of Transportation (TxDOT), Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges:
a. Item 624, Ground Boxes.
b. Item 421, Hydraulic Cement Concrete.
c. Item 432, Riprap.
d. Item 440, Reinforcement for Concrete.
e. Item 618, Conduit.
f. Item 620, Electrical Conductors.
3. Texas Department of Transportation (TxDOT) Departmental Material Specifications (DMS):
a. DMS-11070, Ground Boxes.

1.4 ADMINISTRATIVE REQUIREMENTS [NOT USED]

1.5 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00.

B. All submittals shall be approved by the City prior to delivery.

1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS

A. Product Data Sheets are required for:
1. Ground boxes

1.7 CLOSEOUT SUBMITTALS [NOT USED]

1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]

1.9 QUALITY ASSURANCE [NOT USED]

1.10 DELIVERY, STORAGE, AND HANDLING

A. Storage and Handling Requirements
1. Secure and maintain a location to store the material in accordance with Section 01 66 00.

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1.11 FIELD CONDITIONS [NOT USED]

1.12 WARRANTY [NOT USED]

PART 2 - PRODUCTS

2.1 CITY-FURNISHED PRODUCTS [NOT USED]

2.2 MATERIALS

A. Materials

1. Traffic Signal Ground boxes shall be as follows:
   a. Martin Enterprises or equal, size 24x36x24 (TxDOT Type D)
      1) Provide fabricated precast polymer concrete ground boxes in accordance with DMS-11070.
      2) Ground boxes shall have bolted down covers.
      3) Cast iron covers are not allowed.
      4) Covers will clearly contain the words "TRAFFIC SIGNAL".
2. Fiber Ground Boxes shall be as follows:
   a. Martin Enterprises or equal, size 24x36x36 (TxDOT ITS)
      1) Provide fabricated precast polymer concrete ground boxes in accordance with DMS-11070.
      2) Ground boxes shall have bolted down covers.
      3) Cast iron covers are not allowed.
      4) Covers will clearly contain the words "DANGER HIGH VOLTAGE TRAFFIC SIGNAL".

2.3 ACCESSORIES [NOT USED]

2.4 SOURCE QUALITY CONTROL [NOT USED]

PART 3 - EXECUTION

3.1 INSTALLERS [NOT USED]

3.2 EXAMINATION [NOT USED]

3.3 PREPARATION [NO USED]

3.4 INSTALLATION

A. Special Techniques

1. Use established industry and utility safety practices when installing or removing ground boxes located near underground utilities. Consult with the appropriate utility company before beginning work.
2. Fabricate and install ground boxes as specified in the Drawings. Install ground box to approved line and grade.
3. Utilize precast concrete ground boxes in accordance with this and related Sections.

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4. Construct concrete aprons as specified in the Drawings and in accordance with TxDOT Item 421.
5. A minimum gravel fill of 9 inches shall be placed under each ground box and a concrete skirt installed around each ground box as specified in the Drawings.
6. Lube the bolts, clean out the cover rim, and clean the ground box inside and out prior to final inspection.
7. Removal
   a. Remove existing ground boxes and concrete aprons to at least 6 in. below the conduit level.
   b. Uncover conduit to a sufficient distance so 90 degree bends can be removed, and conduit reconnected.
   c. Clean the conduit in accordance with Section 26 05 33.
   d. Replace conduit within 5 ft. of the ground box.
   e. Remove old conductors and install new conductors as specified in the Drawings.
   f. Backfill area with material equal in composition and density to the surrounding area. Replace surfacing material with similar material to an equivalent condition.

3.5 REPAIR [NOT USED]

3.6 RE-INSTALLATION [NOT USED]

3.7 FIELD QUALITY CONTROL [NOT USED]

3.8 SYSTEM STARTUP [NOT USED]

3.9 ADJUSTING [NOT USED]

3.10 CLEANING [NOT USED]

3.11 CLOSEOUT ACTIVITIES [NOT USED]

3.12 PROTECTION [NOT USED]

3.13 MAINTENANCE [NOT USED]

3.14 ATTACHMENTS [NOT USED]

END OF SECTION

Revision Log		
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SECTION 31 23 16
UNCLASSIFIED EXCAVATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Excavation for general site grading, street grading, and channel excavation.

B. Deviations from this City of Denton Standard Specification:

1. None.

C. Related Specification Sections include but are not limited to:

1. Division 0 - Bidding Requirements, Contract Forms, and Conditions of the Contract.
2. Division 1 - General Requirements.
3. Section 02 41 13 – Selective Site Demolition.
4. Section 02 41 15 – Paving Removal.
5. Section 31 00 00 – Site Clearing.
6. Section 31 24 00 – Embankments.
7. Section 31 25 14 – Erosion and Sedimentation Controls.

1.2 PRICE AND PAYMENT PROCEDURES

A. Measurement and Payment

1. Unclassified Excavation
   a. Measurement
      1) Measured per cubic yard in its final position using the average end area method of Excavation performed. Limits of measurement shown in the Drawings.
   b. Payment
      1) The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid per cubic yard for "Unclassified Excavation."
   c. The price bid shall include:
      1) Shrinkage and/or swelling factors. Contractor is responsible for determining factors and will not be compensated separately.
      2) Excavation of all materials within excavation limits
      3) Finishing parkways and medians
      4) Excavation
      5) Safety
      6) Dewatering
      7) Temporary drainage
      8) Drying
      9) Dust control
      10) Reworking or replacing over excavated material in rock cuts

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11) Placement
12) Compaction
13) Loading, hauling, and unloading
14) Disposal of unsuitable and excess materials not used elsewhere on the job site
15) Finishing slopes, ditches, and channels
16) Maintenance blading or scarifying the ground surface
17) Equipment
18) Tools, equipment, and labor and incidentals needed to execute work

1.3 REFERENCES

A. Abbreviations and Acronyms
1. ROW: Right-of-Way
2. SWPPP: Storm Water Pollution Prevention Plan

B. Classification:
1. All authorized excavation is considered unclassified and involves removal of all materials necessary to complete excavation of the site. Any reference to rock, limestone, or other material on the Drawings and/or this specification is solely for the City and the Contractor's information and is not to be taken as an indication or guarantee of classification of excavation. Payment will not be separated based on classification of excavation unless expressly noted in the Drawings.

C. Reference Standards
1. Reference standards cited in this Section refer to the current reference standard published at the time of the latest revision date logged at the end of this Section unless a date is specifically cited.
a. Occupational Safety and Health Administration (OSHA):
1) Technical Manual Section 5.
2) Laws and Regulations Standard 1926, Safety and Health Regulations for Construction.
b. City of Denton Development Code

1.4 ADMINISTRATIVE REQUIREMENTS

A. Permits
1. For commercial and residential construction, a Clear and Grade Permit is required.
a. No excavation or embankment activities will be allowed without an executed construction contract and an assigned City inspector.
b. If the City determines or suspects excavation and/or embankment activities have occurred prior to an executed contract and a City inspector assigned, all construction activities could be suspended for at least 30 days pending the results of the Pre-Earthwork meeting.
c. Any damages caused by early clearing and grading activities will be repaired at no cost to the City.

B. Sequencing
1. Sidewalk Construction
a. Where existing sidewalks are to be closed during Paving Removal activities:
1) Utilize pedestrian/sidewalk detour route specified in the Drawings

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a) If no detour route is provided, submit a pedestrian/sidewalk detour route to City for review.

b. The pedestrian/sidewalk detour route will be subsidiary to pertinent Traffic Control items included with the project.

c. Install all sidewalk detours and closures in accordance with the TMUTCD, State, and local guidelines.

d. Provide any traffic control devices in accordance with Section 34 71 13.

C. Pre-Earthwork Meeting

1. Hold a Pre-Earthwork meeting at the same time as the Pre-Site Clearing Meeting. Invite the City and appropriate representatives.

2. Clearly mark all the following items prior to the meeting:

a. All requirements for pre-site clearing meeting in accordance with 31 00 00.

b. Excavation limits

c. Cut/fill stakes

3. Submit means and methods for any rock cutting for review prior to the Pre-Earthwork Meeting.

4. Have the SWPPP in place and inspected by Watershed Protection in accordance with Section 01 57 13 prior to excavation activities.

5. Determine any site-specific constraints or concerns prior to meeting for review.

1.5 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00.

B. All submittals shall be approved by the City prior to delivery.

1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS

A. Informational Submittal

1. Equipment Information

a. Submittal for all major equipment to include:

1) Equipment name

2) Size

3) Intended use

2. Explosives, Blasting, and Rock Ripping

a. Submit storage locations and guidelines for using explosives.

b. For rock ripping and blasting, submit means and methods prior to Pre-Earthwork meeting for review.

c. Provide a list of personnel and employer who will be handling and using explosives. Provide reference information including previous projects and certifications proving explosive qualifications.

1.7 CLOSEOUT SUBMITTALS [NOT USED]

1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]

1.9 QUALITY ASSURANCE

A. Excavation Safety

1. Perform all excavations in a safe manner.

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2. Comply with the requirements of OSHA 29 CFR part 1926 and state requirements when performing excavation, sheeting, and bracing.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Storage and Handling Requirements

1. Secure and maintain a location to store the material prior to any excavation activities beginning in accordance with Section 01 66 00.
2. Store excavated material to be used in other areas within the right-of-way (ROW) or easement limits unless specifically disallowed in the Contract Documents.
   a. If the Contract Documents do not allow the storage of excavated materials within ROW or easements, secure and maintain an adequate storage location off-site.
3. Store material and equipment in approved areas that are at least 30 feet from edge of road limits. Install erosion control fencing around staging areas.
4. For urban areas with limited staging areas, designate offsite location for storing and staging of materials and equipment. If this is not feasible, obtain approval from the City to stage and store materials within project site.
5. All offsite staging areas to be in accordance with SWPPP and Watershed Protection requirements. Offsite staging areas are considered part of the project site and will need to be included with the SWPPP and Watershed Protection review.
6. If excavated material is stored off-site:
   a. Provide an authorized letter from property owner approving the storage of excavated materials.
   b. Contractor is responsible for negotiating and coordinating with the property owner.
   c. The City is not responsible for establishing an off-site location.
   d. The City is not liable for any damage resulting in off-site storage of excavated materials.
7. Remove any excavated material not used in other areas within 48 hours of excavation activities.
8. Do not block drainage ways, inlets, or driveways with excavation activities or materials.
9. Provide erosion control in accordance with Section 31 25 14.
10. Store materials only in areas barricaded as provided in the traffic control plans or as approved by the City if excavation is performed during active traffic.
11. Do not store material within the drip line of any tree or in landscaped areas.
12. Install tree protection in accordance with Section 31 10 00.

1.11 FIELD CONDITIONS

A. Existing Conditions

1. Any data provided regarding subsurface conditions of excavated material is not intended as a representation or warranty of accuracy or continuity of proposed excavated material.
2. The City is not responsible for interpretations or conclusions made by the Contractor regarding the existing material to be excavated.

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1.12 WARRANTY [NOT USED]

PART 2 - PRODUCTS [NOT USED]

2.1 CITY-FURNISHED [NOT USED]

2.2 MATERIALS [NOT USED]

2.3 ACCESSORIES [NOT USED]

2.4 SOURCE QUALITY CONTROL [NOT USED]

PART 3 - EXECUTION

3.1 INSTALLERS [NOT USED]

3.2 EXAMINATION [NOT USED]

3.3 PREPARATION

A. Surface Preparation

1. If needed, provide temporary drainage to maintain positive drainage throughout excavation activities. Any temporary drainage construction will be considered subsidiary to excavation.
2. Dewatering and temporary storm drain activities will be considered part of the SWPPP and Watershed Protection review and are required to be in accordance with all requirements listed therein.

B. Demolition / Removal

1. Remove any existing pavement in accordance with Section 02 41 15 and 02 41 13.

3.4 EXCAVATION

A. General

1. Accept ownership of unsuitable or excess material and dispose of material off-site in accordance with Federal, State, and local regulations. City is not responsible for any disposed material or disposal activities.
2. Perform excavations while material to be excavated is dry aside from water applied for dust control.
3. Contractor is responsible for the condition of the subgrade until the pavement is in place.
4. Over-excavate and replace any portion of subgrade that becomes damaged or unstable due to weather or construction activities prior to stabilizing the subgrade, installing base material, or placing the pavement. This will be at no cost to the City.
5. Separate, remove, and dispose of unacceptable fill material as defined in Section 31 24 00 in accordance with Federal, State, and local regulations.
6. Maintain positive drainage in the excavated area to avoid damage to any existing structures, proposed structures, and the roadway.

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7. Shape slopes to avoid loosening material below or outside the proposed grade.
8. Remove and dispose of slides as directed.

B. Earth Cut

1. Excavate to finish grade or subgrade within acceptable subgrade tolerances.
2. Use approved embankment material compacted in accordance with 31 24 00 to replace over-excavated material at no cost to City. Anticipated reasons for over excavation can include, but are not limited to:
   a. Excavation below an acceptable subgrade tolerance
   b. Soils damaged due to weather or construction activities
3. Shape and compact subgrade in accordance with Section 31 24 00.
4. Subgrade Tolerances
   a. Excavate to within 0.1 foot in all directions.
   b. In areas of over excavation, provide fill material approved by the City at no cost to City.

C. Rock Cut

1. Do not use dynamite or rock ripping within 500 feet of residences or commercial development.
2. Blasting
   a. Obtain City approval prior to any blasting.
   b. Send notification at least 15 days in advance to all property owners within 1,000 feet of the blasting site.
   c. Follow all OSHA regulations for explosives and blasting agents, including but not limited to requirements in the OSHA Technical Manual Section 5, and OSHA Laws and Regulations Standard 1926, Safety and Health Regulations for Constructions.
   d. Use only authorized workers with training, knowledge, or experience in the field of transporting, storing, handling, and use of explosives.
      1) Authorized workers also need to have working knowledge of State and local laws and regulations pertaining to explosives.
   e. If there are concerns that seismic vibrations may cause damage to adjacent structures, provide:
      1) A structural engineer to determine safe limits to prevent any damage.
      2) All equipment, monitors, tools, and engineering design necessary at no cost to the City.
   f. Use blasting mats or other approved containment equipment to ensure that no rocks or debris will be thrown into the air.
   g. Comply with all City of Denton noise ordinances when blasting.
3. Excavate to finish grade or subgrade within acceptable subgrade tolerances.
4. For small pockets or thin layers, remove rock to at least 12-inches below subgrade.
5. Use approved embankment material compacted in accordance with 31 24 00 to replace over excavated material at no cost to City.

D. Water for Construction

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1. Provide water as needed for site preparation, compaction, dust control, and other incidental activities in accordance with local requirements in accordance with Section 01 35 13.

E. Dewatering

1. Dewatering is subsidiary to excavation and includes the installation and operation of all pumping, bailing, well-pointing, sumps, and draining necessary to keep the excavation free from groundwater, seepage water, water from storm drains, wastewater collection systems, ditches, creeks, ponds, and other sources.
2. Keep channels, trenches, pits, and other low point excavations drained as much as practical during construction at no cost to the City.
3. Construction will not be permitted in standing water.
4. Conform all discharge from dewatering activities to Federal, State, and local requirements in a manner approved by the City.
5. Control outlet velocities from dewatering discharges to prevent erosion.

F. Excavated Material

1. Maintain safe and convenient access to private and public properties adjacent to excavation activities unless specified in the Drawings. Obtain approval from the City for maintenance of access methods.
2. Acceptable fill material may be used for embankment in accordance with 31 24 00.
3. Stockpile acceptable excavated materials on-site in accordance with Sections 31 10 00 and 31 24 00. Proper erosion control and BMPs to be utilized in accordance with the Drawings, local guidelines, and approved by the City.

G. Methods of Excavation

1. Submit means and methods for review by the City prior for any method of excavation that is not using traditional excavation methods.
2. Comply with all Federal, State, and local regulations when developing and submitting for approval any alternative method.
3. If an alternative method is requested and approved after contract execution, perform excavation at no additional cost to the City beyond the stated excavation unit price in the bid form.

3.5 REPAIR

A. Repair the following at no cost to the City if any damage is caused due to excavation activities:

1. Adjacent concrete or asphalt pavement to remain
2. Adjacent sidewalk to remain
3. Adjacent curb or curb and gutter to remain
4. Adjacent subgrade or base material to remain
5. Utility piping, structures, and appurtenances
6. Irrigation systems including but not limited to sprinkler heads, conduit, and pipe.
7. Landscape beds or planters
8. Decorative hardscape or landscape features

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9. Retaining walls

3.6 RE-INSTALLATION [NOT USED]

3.7 SITE QUALITY CONTROL [NOT USED]

3.8 SYSTEM STARTUP [NOT USED]

3.9 ADJUSTING [NOT USED]

3.10 CLEANING [NOT USED]

3.11 CLOSEOUT ACTIVITIES [NOT USED]

3.12 PROTECTION [NOT USED]

3.13 MAINTENANCE [NOT USED]

3.14 ATTACHMENTS [NOT USED]

END OF SECTION

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SECTION 31 24 00
EMBANKMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Furnishing, placing, and compacting approved soils for construction.

B. Deviations from this City of Denton Standard Specification:

1. None.

C. Related Specification Sections include but are not limited to:

1. Division 0 - Bidding Requirements, Contract Forms, and Conditions of the Contract.
2. Division 1 - General Requirements.
3. Section 31 25 14 – Erosion and Sedimentation Controls.

1.2 PRICE AND PAYMENT PROCEDURES

A. Measurement and Payment

1. Embankment
   a. Measurement
      1) Measured per cubic yard in its final position using the average end area method of Embankment performed. Limits of measurement shown in the Drawings.
   b. Payment
      1) The work performed in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid per cubic yard for "Embankment."
   c. The price bid shall include:
      1) Transporting or hauling material
      2) Placing, compacting, and finishing Embankment
      3) Construction Water
      4) Dust Control
      5) Proof Rolling
      6) Disposal of excess materials
      7) Reworking or replacement of undercut material
2. Select Fill Embankment
   a. Measurement
      1) Measured cubic yard in its final position using the average end area method of Select Fill Embankment performed. Limits of measurement shown in the Drawings.

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b. Payment
1) The work performed in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid per cubic yard for "Select Fill Embankment".
c. The price bid shall include:
1) Transporting or hauling material
2) Placing, compacting, and finishing Embankment
3) Construction Water
4) Dust Control
5) Clean-up
6) Proof Rolling
7) Disposal of excess materials
8) Reworking or replacement of undercut material

1.3 REFERENCES

A. Reference Standards
1. Reference standards cited in this Section refer to the current reference standard published at the time of the latest revision date logged at the end of this Section unless a date is specifically cited.
2. ASTM Standards:
a. D2487, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
b. D4318, Test Procedure for Determining Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
c. D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort.
3. TEX-115-E, FIELD METHOD FOR DETERMINING IN-PLACE DENSITY OF SOILS AND BASE MATERIALS

1.4 ADMINISTRATIVE REQUIREMENTS

A. Permits
1. For commercial and residential construction, a Clear and Grade Permit is required.
a. No excavation or embankment activities will be allowed without an executed construction contract and an assigned City inspector.
b. Any excavation or embankment activities performed prior to an executed construction contract and an assigned City inspector is subject to additional testing, compaction, and site requirements at no cost to the City.

B. Sequencing
1. Install all erosion control measures in accordance with Section 31 25 14 prior to commencing any earthwork activities.
2. Complete all site clearing in accordance with Section 31 10 00 prior to commencing any earthwork activities.

C. Pre-Earthwork Meeting
1. A Pre-Earthwork Meeting is not required for Capital Improvement projects.
2. Hold a Pre-Earthwork meeting at the same time as the Pre-Site Clearing Meeting. Invite the City and appropriate representatives.

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3. Clearly mark all the following items prior to the meeting:
   a. All requirements for pre-site clearing meeting in accordance with 31 10 00.
   b. Excavation limits
   c. Cut/fill stakes
4. Have the SWPPP in place and inspected by Watershed Protection in accordance with Section 01 57 13 prior to Excavation activities.
5. Determine any site-specific constraints or concerns prior to meeting for review.

1.5 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00.

B. All submittals shall be approved by the City prior to commencement of any lime treating activities.

1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS

A. Information Submittal
1. Equipment Information
   a. Submittal for all major equipment to include:
      1) Equipment name
      2) Size
      3) Intended use

1.7 CLOSEOUT SUBMITTALS

A. Test and Evaluation Reports
1. All test reports generated during testing.

1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]

1.9 QUALITY ASSURANCE [NOT USED]

1.10 DELIVERY, STORAGE, AND HANDLING

A. Storage and Handling Requirements
1. Secure and maintain a location to store the material in accordance with Section 01 66 00.
2. Within Existing Rights-of-Way (ROW)
   a. Store soil within existing ROW, easements, or temporary construction easements, unless specifically disallowed in the Contract Documents.
   b. Do not block drainage ways, inlets, or driveways.
   c. When the Work is performed in active traffic areas, store materials only in areas barricaded as provided in the traffic control plans.
   d. In non-paved areas, do not store material on the root zone of any trees or in landscaped areas.
3. Designated Storage Areas
   a. If the Contract Documents do not allow the storage within the ROW, easement or temporary construction easement, secure and maintain an adequate storage location.
   b. Provide an affidavit verifying rights have been secured to store the materials on private property.

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c. Do not block drainage ways.

1.11 FIELD CONDITIONS

A. Ambient Conditions

1. Surface temperature must be at least 40°F and the ambient temperature must be 45°F and rising.
2. Do not install embankment during or shortly after rain events which prevent proper work placement of the material and compaction.
   a. Prior to resuming compaction operations:
      1) Let soil dry to optimal density.
      2) Remove muddy material off the surface to expose firm and compacted materials.

1.12 WARRANTY [NOT USED]

PART 2 - PRODUCTS

2.1 CITY-FURNISHED PRODUCTS [NOT USED]

2.2 MATERIALS

A. General

1. Furnish material capable of forming a stable embankment.
2. Furnish material free from trees, stumps, roots, vegetation, or other deleterious materials.

B. Acceptable Fill Material

1. In-situ or imported soils classified as CL, CH, SC, or GC in accordance with ASTM D2487.
2. Free from deleterious materials, boulders over 6 inches in size, shale and organics.
3. Can be placed free from voids.
4. Has 20 percent passing the number 200 sieve.
5. Meets the requirements of Table 1.

Table 1 – Acceptable Fill Material Requirements

Property	Test Method	Specification Limit
Liquid Limit (LL)	Tex-104-E	≤ 50
Plasticity Index (PI)	Tex-106-E	≤ 35
Sulfate Limit	Tex-145-E	≤ 3000 ppm
Bar Linear Shrinkage	Tex-107-E	≥ 2

C. Blended Fill Material

1. In-situ soils classified as SP, SM, GP, or GM in accordance with ASTM D2487.
2. Blended with in-situ or imported Acceptable Fill material in accordance with the requirements of this Section.

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3. Free from deleterious materials, boulders over 6 inches in size, shale and organics.
4. Has 20 percent passing the number 200 sieve.
5. Final blended product meets the requirements of Table 1.

D. Unacceptable Fill Material

1. In-situ soils classified as ML, MH, PT, OL, or OH in accordance with ASTM D2487

E. Select Fill Material

1. Classified as SC or CL in accordance with ASTM D2487
2. Free from deleterious materials, boulders over 6 inches in size, shale and organics.
3. Can be placed free from voids.
4. Has 20 percent passing the number 200 sieve.
5. Meets the requirements of Table 2.

Table 2 – Select Fill Material Requirements

Property	Test Method	Specification Limit
Liquid Limit (LL)	Tex-104-E	≤ 35
Plasticity Index (PI)	Tex-106-E	$8 < PI \leq 20$
Sulfate Limit	Tex-145-E	≤ 2000 ppm
Bar Linear Shrinkage	Tex-107-E	≥ 2

2.3 ACCESSORIES [NOT USED]

2.4 SOURCE QUALITY CONTROL

A. Borrow material shall be tested prior to delivery to the Site.

1. Provide Proctor Test results, Gradation, and Atterberg Limits for Borrow material from each source.
   a. All testing listed above shall be performed in accordance with ASTM D698, D6913, and D4318 respectively.

PART 3 - EXECUTION

3.1 INSTALLERS [NOT USED]

3.2 EXAMINATION [NOT USED]

3.3 PREPARATION

A. Protection of In-Place Conditions

1. Pavement
   a. Conduct activities in such a way that does not damage existing pavement designated to remain.

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b. Repair or replace any pavement damaged due to the negligence of the contractor outside the limits designated for pavement removal at no additional cost.

2. Trees
   a. Flag and protect all trees designated to remain in accordance with Section 31 10 00.
   b. Conduct embankments in a manner such that there is no damage to the tree canopy.
   c. Prune or trim tree limbs as specified in the Drawings or as directed by City.
      1) Pruning or trimming may only be accomplished with equipment specifically designed for tree pruning or trimming.
3. Above ground Structures
   a. Protect all above ground structures adjacent to the construction.

B. Surface Preparation

1. Backfill stump holes or other small incidental excavations due to site clearing with material of same properties as in-situ material.
2. Scarify base soil surface on which the embankment will be constructed to a minimum depth of 6 inches.
3. Bench slopes before placing new material.

3.4 EMBANKMENT

A. General

1. Provide material type as specified in the Drawings.
2. Begin filling in the lowest section or the toe of the work area.
3. When fill is placed directly or upon older fill, remove debris and any loose material and proof roll existing surface.
4. After spreading the loose lifts to required thickness and adjusting its moisture content as necessary, simultaneously recompact scarified material with the placed embankment material.
5. Compact material in loose lifts no greater than 8 inches.
6. Roll with enough passes to achieve the minimum required compaction.
7. Provide water sprinkled as necessary to achieve required moisture levels for specified compaction.
8. Do not add additional lifts until the entire previous lift is properly compacted.

B. Surface Water Control

1. Grade surface horizontally but provide with sufficient longitudinal and transverse slope to allow for runoff of surface water from every point.
2. Conduct fills so no obstruction to drainage from any other sections of fill is created.
3. Install temporary dewatering sumps in low areas during filling where excess amounts of runoff collect.
4. Compact uniformly throughout. Keep surfaces of fill reasonably smooth and free from humps and hollows that would prevent proper uniform compaction.

C. Earth Embankments

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1. Construct embankments in successive layers, evenly distributing materials in lengths suited for sprinkling and rolling.
2. Move the material dumped in piles or windrows by blading or by similar methods and incorporate it into uniform layers.
3. Construct embankments in layers approximately parallel to the finished grade of the street.
4. Featheredge or mix abutting layers of dissimilar material for at least 100 feet to ensure no abrupt changes in the material.
5. Break down clods or lumps of material and mix embankment until a uniform material is attained.
6. Establish grade and shape to the typical sections specified in the Drawings.
7. Maintain finished sections of embankment to the grade and compaction requirements until the project is accepted.

D. Rock Embankments

1. Rock Embankments for roadways are only allowed when specified in the Drawings.
2. Construct rock embankments in successive layers for the full width of the roadway cross-section with a depth of 18 inches or less.
3. The layer depth for large rock sizes shall not exceed a depth of 18 inches in any case.
4. Fill voids created by the large stone matrix with smaller stones during the placement and filling operations.
5. Ensure the depth of the embankment layer is greater than the maximum dimension of any rock.
6. Do not place rock greater than 18 inches in its maximum dimension.
7. Do not place rock embankments in any location where future utilities are anticipated.
8. Construct the final layer with graded material so the density and uniformity is in accordance with compaction requirements.

E. Density Control

1. Determine maximum dry density and moisture content using ASTM D698 and submit moisture-density curves to City for review.
2. Compact each lift to meet the following requirements:
   a. For soils with a PI less than 35, compact to 98% of maximum dry density, plus or minus 2%.
   b. For soils with a PI greater than 35, compact to at least 98% of maximum dry density.

F. Maintenance of Moisture and Reworking

1. Maintain the density and moisture content once all requirements are met.
2. For soils with a PI greater than 15, maintain the moisture content no lower than 4 percentage points below optimum.
3. Rework the material to obtain specified compaction when the material loses the required stability, density, moisture, or finish.

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4. Alter the compaction methods and procedures on subsequent work to obtain specified density as directed by City.

3.5 REPAIR

A. Repair the following at no cost to the City if any damage is caused due to Embankment activities:

1. Adjacent concrete or asphalt pavement to remain
2. Adjacent sidewalk to remain
3. Adjacent curb or curb and gutter to remain
4. Adjacent subgrade or base material to remain
5. Utility pipes
6. Irrigation systems including but not limited to sprinkler heads, conduit, and pipe.
7. Landscape beds or planters
8. Decorative hardscape or landscape features
9. Retaining walls

3.6 RE-INSTALLATION [NOT USED]

3.7 FIELD QUALITY CONTROL

A. Field Tests and Inspections

1. Proctors
   a. Perform Proctor Tests in accordance with ASTM D698.
   b. Notify the City if the characteristic of the soil changes.
   c. Perform new Proctors for varying soils:
      1) When indicated in the geotechnical investigation in the Appendix
      2) If notified by the Engineer
      3) At the convenience of the City
   d. For Embankments where different soil types are present and are blended, the Proctors shall be based on the mixture of those soils.
2. Proof Rolling
   a. City must be on-site during proof rolling operations.
   b. Make at least two passes with the proof roller, offsetting each trip by at most one tire width.
   c. Correct areas of rutting or pumping and unstable or non-uniform areas in accordance with this Section.
3. Density Testing of Embankments
   a. Density Testing shall be in accordance with ASTM D6938.
   b. City must be on site during density testing.
   c. For Embankments under future pavement:
      1) Perform density testing twice per working day when compaction operations are being conducted.
      2) Measure density every 100' along corridor.
      3) City to determine density testing locations.
   d. For Embankments not under future pavement or structures:
      1) The City will perform density testing once per working day when compaction operations are being conducted.

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2) Measure density every 250' along embankment.
3) City to determine density testing locations.

e. Test reports shall include:
1) Location of test by station number
2) Time and date of test
3) Depth of testing
4) Field moisture
5) Dry density
6) Proctor identifier
7) Percent Proctor Density

B. Non-Conforming Work

1. All non-conforming work shall be removed and replaced at no additional cost to the City.

3.8 SYSTEM STARTUP [NOT USED]

3.9 ADJUSTING [NOT USED]

3.10 CLEANING [NOT USED]

3.11 CLOSEOUT ACTIVITIES [NOT USED]

3.12 PROTECTION [NOT USED]

3.13 MAINTENANCE [NOT USED]

3.14 ATTACHMENTS [NOT USED]

END OF SECTION

Revision Log		
DATE	NAME	SUMMARY OF CHANGE
6/14/2024		Added TXDOT reference standard TEX-115-E
6/14/2024		Excluded shale material from all backfill options

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SECTION 31 25 14
EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Installation and maintenance of temporary control measures necessary to prevent and control soil erosion, sedimentation, and water pollution.
2. Preparation and implementation of Contractor produced Erosion Control Plan.

B. Deviations from this City of Denton Standard Specification:

1. None.

C. Related Specification Sections include but are not limited to:

1. Division 0 - Bidding Requirements, Contract Forms, and Conditions of the Contract.
2. Division 1 - General Requirements.
3. Section 32 05 26 – Aggregates for Exterior Improvements.

1.2 PRICE AND PAYMENT PROCEDURES

A. Measurement and Payment

1. Silt Fence
   a. Measurement
      1) Measured per linear foot of Silt Fence installed.
   b. Payment
      1) The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid per linear foot for "Silt Fence" installed.
   c. The price bid shall include:
      1) Furnishing and installing Silt Fence as specified by the Drawings
      2) Posts
      3) Filter fabric
      4) Net reinforcement
      5) Fasteners
      6) Stone overflows
      7) Safety caps
      8) Cleaning
      9) Disposal of silt
      10) Repair of damaged Silt Fence
2. Check Dam
   a. Measurement
      1) Measured per linear foot of Check Dam installed.
   b. Payment

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1) The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid per linear foot for "Check Dam" installed.

c. The price bid shall include:
1) Furnishing and installing Check Dam as specified by the Drawings
2) Aggregate, wire reinforcement, and filter fabric
3) Excavation
4) Loading, unloading, hauling, and storing
5) Cleaning
6) Disposal of silt
7) Repair of damaged Check Dam

3. Organic Filter Tube
a. Measurement
1) Measured per linear foot of Organic Filter Tube installed.
b. Payment
1) The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid per linear foot for "Organic Filter Tube" installed.
c. The price bid shall include:
1) Furnishing and installing Organic Filter Tube as specified by the Drawings
2) Containment mesh
3) Core material
4) Posts
5) Rock bags
6) Cleaning
7) Disposal of silt
8) Repair of damaged Organic Filter Tube

4. Inlet Protection
a. Measurement
1) Measured per each of Inlet Protection installed.
b. Payment
1) The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid per each for "Inlet Protection" installed.
c. The price bid shall include:
1) Furnishing and installing Inlet Protection as specified by the Drawings
2) All items pertaining to hog wire for erosion control as needed
3) Loading, unloading, hauling, and storing
4) Cleaning
5) Disposal of silt
6) Repair of damaged Inlet Protection items

5. Erosion Control Blanket
a. Measurement
1) Measured per square yard of Erosion Control Blanket installed.
b. Payment
1) The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid per square yard for "Erosion Control Blanket" installed.

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c. The price bid shall include:
1) Furnishing and installing Erosion Control Blanket as specified by the Drawings
2) Blanket and staples
3) Loading, unloading, hauling, and storing
4) Cleaning
5) Disposal of silt
6) Repair of damaged Erosion Control Blanket

6. Stabilized Construction Exit
a. Measurement
1) This item is considered subsidiary to the various items bid.
b. Payment
1) The work performed and the materials furnished in accordance with this item are subsidiary to the various items bid and no other compensation will be allowed.

7. Mulching
a. Measurement
1) Measured square yard of Mulching installed.
b. Payment
1) The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid per square yard for "Mulching" installed.
c. The price bid shall include:
1) Furnishing and installing Mulching as specified by the Drawings
2) Loading, unloading, hauling, and storing

8. Pipe Inlet Sediment Trap
a. Measurement
1) Measured per each Pipe Inlet Sediment Trap installed.
b. Payment
1) The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid per each for "Pipe Inlet Sediment Trap" installed.
c. The price bid shall include:
1) Furnishing and installing Pipe Inlet Sediment Trap as specified by the Drawings
2) Filter stone
3) Loading, unloading, hauling, and storing
4) Cleaning
5) Disposal of silt
6) Repair of damaged Pipe Inlet Sediment Traps

9. Stone Outlet Sediment Trap
a. Measurement
1) Measured per each Stone Outlet Sediment Trap installed.
b. Payment
1) The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid per each for "Stone Outlet Sediment Trap" installed.
c. The price bid shall include:

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1) Furnishing and installing Stone Outlet Sediment Trap as specified by the Drawings
2) Filter stone
3) Loading, unloading, hauling, and storing
4) Cleaning
5) Disposal of silt
6) Repair of damaged Stone Outlet Sediment Traps

10. Turf Reinforcement Mat
    a. Measurement
        1) Measured square yard of Turf Reinforcement Mat installed.
    b. Payment
        1) The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid per square yard for "Turf Reinforcement Mat" installed.
    c. The price bid shall include:
        1) Furnishing and installing Turf Reinforcement Mat as specified by the Drawings
        2) Loading, unloading, hauling, and storing
        3) Cleaning
        4) Disposal of silt
        5) Repair of damaged Pipe Inlet Sediment Traps items
11. Dewatering Controls
    a. Measurement
        1) This item is considered subsidiary to the various items bid.
    b. Payment
        1) The work performed and the materials furnished in accordance with this item are subsidiary to the various items bid and no other compensation will be allowed.
12. Stormwater Pollution Prevention Device Installation
    a. Measurement
        1) Measurement for this item shall be by lump sum.
    b. Payment
        1) The work performed and materials furnished in accordance with this item shall be paid for at the lump sum price bid for all "Stormwater Pollution Prevention Device Installation".
    c. The price bid shall include:
        1) Furnishing and installing all items under Stormwater Pollution Prevention Device Installation as specified by the Drawings
        2) Excavation
        3) Loading, unloading, hauling, and storing
        4) Cleaning
        5) Disposal of silt
        6) Repair of damaged Storm Water Pollution Prevention Devices
13. Remove Stormwater Pollution Prevention Devices
    a. Measurement
        1) Measurement for this item shall be by lump sum.

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b. Payment
1) The work performed and materials furnished in accordance with this item shall be paid for at the lump sum price bid for all "Remove Stormwater Pollution Prevention Devices."
c. The price bid shall include:
1) Removing all items previously installed as part of the Stormwater Pollution Prevention Plan as specified by the Drawings
2) Loading, unloading, and hauling
3) Cleaning
4) Disposal of silt

1.3 REFERENCES

A. Abbreviations and Acronyms
1. Environmentally Sensitive Area: ESA

B. Reference Standards
1. Reference standards cited in this Section refer to the current reference standard published at the time of the latest revision date logged at the end of this Section unless a date is specifically cited.
2. City of Denton, Stormwater Design Criteria Manual
3. North Central Texas Council of Governments (NCTCOG) Integrated Stormwater Management (iSWM) Technical Manual.
4. Texas Department of Transportation, Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges (TxDOT):
a. Item 169, Soil Retention Blankets.
5. Texas Department of Transportation (TxDOT), Departmental Material Specifications (DMS):
a. DMS-6200, Filter Fabric.
b. DMS-6230, Temporary Sediment Control Fence Fabric.
c. DMS-6370, Erosion Control Blankets.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Sequencing
1. Ensure erosion control measures are fully installed prior to the commencement of any earth disturbing activities.
2. If required, ensure ESA protection measures are fully installed prior to the commencement of any earth disturbing activities.
3. Contact Watershed Protection division for initial inspection of installed erosion control or ESA protection measures prior to the commencement of any earth disturbing activities. Watershed@cityofdenton.com
4. On phased projects, final stabilization shall be completed and Erosion and Sediment Control devices removed from each phase as construction is completed.

1.5 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00.

B. All submittals shall be approved by the City prior to delivery.

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1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS

A. Storm Water Pollution Prevention Plan (SWPPP) submittals in accordance with Section 01 57 13 where land disturbance exceeds 1 acre.

B. Erosion Control Plan submittal when Contractor is responsible for creating site specific erosion control plan.

1. Plan content and requirements as specified in the Drawings
2. Plan to adhere to the general standards of the City of Denton's Development Code Section 7.3.5

C. Product Data

1. Provide product data from each manufacturer supplying Erosion and Sediment Control devices and accessories.
2. Product data sheets for all products to include:
   a. Manufacturer name

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b. Date
c. Material description
d. Point of delivery
e. Data and test results as specified in this Section
f. Manufacturer Recommended Storing Data, if applicable
g. Application Recommendations, if applicable

1.7 CLOSEOUT SUBMITTALS [NOT USED]

1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]

1.9 QUALITY ASSURANCE [NOT USED]

1.10 DELIVERY, STORAGE, AND HANDLING

A. Storage and Handling Requirements
1. Secure and maintain a location to store the material in accordance with Section 01 66 00.
2. Store all storm water pollution prevention materials in accordance with manufacturer's recommendations.

1.11 SITE CONDITIONS [NOT USED]

1.12 WARRANTY [NOT USED]

PART 2 - PRODUCTS

2.1 CITY-SUPPLIED PRODUCTS [NOT USED]

2.2 MATERIALS

A. Silt Fence
1. Fabric
a. Provide fabric in accordance with the following criteria:

Property	Test Method	Specification Limit
Tensile Strength	ASTM D4632	90-lbs
Puncture Rating	ASTM D4833	60-lbs
Mullen Burst Rating	ASTM D3796	280-psi
Apparent Opening Size	ASTM D4751	Sieve No. 30 to No. 100
Ultraviolet Resistance	ASTM D4355	70 percent min

2. Posts
a. Provide steel T-section or L-section posts, 1.3 pounds per linear foot, and 4 feet in length minimum.
b. Provide plastic caps on all steel posts in areas exposed to pedestrian traffic.
c. Wood posts may be approved by City if project duration is expected to be less than 90 days.
3. Net Reinforcement

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a. Provide net reinforcement of at least 12 gauge galvanized welded wire mesh, with a maximum opening size of 2x2 inches.

4. Stone Overflows
   a. Provide 1 1/2 inch washed stone aggregate in accordance with Section 32 05 26.

B. Check Dam

1. Aggregate
   a. Provide 3 to 6 inch aggregate in accordance with Section 32 05 26 for check dam heights of 24 inches or less.
   b. Provide 4 to 8 inch aggregate in accordance with Section 32 05 26 for check dam greater than 24 inches in height.
2. Wire
   a. If required, provide mesh consisting of minimum 20 gauge galvanized wire.
3. Fabric
   a. For check dams greater than 18 inches in height, provide filter fabric in accordance with the following criteria:

Property	Test Method	Specification Limit
Tensile Strength	ASTM D4632	250-lbs
Puncture Rating	ASTM D4833	135-lbs
Mullen Burst Rating	ASTM D3796	420-psi
Apparent Opening Size	ASTM D4751	Sieve No. 20 max
Ultraviolet Resistance	ASTM D4355	20 percent min

C. Organic Filter Tube

1. Containment Mesh
   a. Provide biodegradable, photodegradable, or recyclable containment mesh with a minimum rated life of one year under normal site conditions, such as burlap, twine, UV photodegradable plastic, or polyester.
      1) Obtain approval from the City for use of any other material.
   b. Provide recyclable containment mesh for temporary organic filter tube installation.
   c. Provide biodegradable or photodegradable containment mesh when organic filter tube will remain in place as part of vegetative system.
2. Core Material
   a. Provide biodegradable or recyclable core material such as compost, mulch, or coir.
      1) Obtain approval from the City for use of any other material.
3. Posts
   a. Provide steel T-section or L-section posts, 1.3 pounds per linear foot or 2 inches by 2 inches wooden posts.
   b. Provide posts at least 6 inches longer than the outside diameter of the Organic Filter Tube.

D. Inlet Protection

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1. Provide Inlet Protection comprised of Organic Filter Tubes or rock bags for erosion control in accordance with this Section.

E. Erosion Control Blanket

1. Blanket
   a. In accordance with DMS 6370.
2. Staples
   a. In accordance with the Erosion Control Blanket manufacturer recommendations.

F. Stabilized Construction Exit

1. Aggregate
   a. Provide 3 to 6 inch aggregate in accordance with Section 32 05 26.

G. Mulching

1. Provide type of organic mulching as specified in the Drawings.

H. Pipe Inlet Sediment Trap

1. Riprap
   a. Provide 6 to 12 inch Dry Stone Riprap in accordance with Section 31 37 00.
2. Filter Stone
   a. Provide 1 1/2 inch washed stone aggregate in accordance with Section 32 05 26.
3. Wire
   a. Provide mesh consisting of minimum 20 gauge galvanized wire with 1/2 inch by 1/2 inch openings.
4. Fabric
   a. Provide Filter Fabric meeting the following criteria:

Property	Test Method	Specification Limit
Tensile Strength	ASTM D4632	250-lbs
Puncture Rating	ASTM D4833	135-lbs
Mullen Burst Rating	ASTM D3796	420-psi
Apparent Opening Size	ASTM D4751	Sieve No. 20 max
Ultraviolet Resistance	ASTM D4355	20 percent min

5. Concrete Block
   a. Provide standard 8-inch x 8-inch x 16-inch concrete masonry units in accordance with ASTM C139.

I. Stone Outlet Sediment Trap

1. Riprap
   a. Provide 6 to 12 inch Dry Stone Riprap in accordance with Section 31 37 00.
2. Filter Stone
   a. Provide 1 1/2 inch washed stone aggregate in accordance with Section 32 05 26.
3. Fabric
   a. Provide Filter Fabric in accordance with the following criteria:

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Property	Test Method	Specification Limit
Tensile Strength	ASTM D4632	250-lbs
Puncture Rating	ASTM D4833	135-lbs
Mullen Burst Rating	ASTM D3796	420-psi
Apparent Opening Size	ASTM D4751	Sieve No. 20 max
Ultraviolet Resistance	ASTM D4355	20 percent min

J. Turf Reinforcement Mat

1. Provide Turf Reinforcement Mats in accordance with TxDOT Item 169 Approved Products List, *Erosion Control Approved Products* and in accordance with the following criteria:

Property	Test Method	Specification Limit
Minimum Thickness	ASTM D6525	0.25 in
Ultraviolet Resistance	ASTM D4355	80 percent
Tensile Strength	ASTM D6818	175 lbs/ft

K. Dewatering Controls

1. Sediment Filter Bag
   a. Provide sediment filter bags made of non-woven, needle-punched, geotextile that meets the following criteria:

Property	Test Method	Specification Limit
Tensile Strength	ASTM D4632	250-lbs
Puncture Rating	ASTM D4833	135-lbs
Mullen Burst Rating	ASTM D3796	420-psi
Ultraviolet Resistance	ASTM D4355	20 percent min
Water Flow Rate	ASTM D4491	85 to 110 gpm/ft^2

2. Temporary Sediment Tank
   a. Provide compartmented container with a storage volume equal to 1 cubic foot for each gallon per minute of pump discharge capacity.

2.3 ACCESSORIES [NOT USED]

2.4 SOURCE QUALITY CONTROL [NOT USED]

PART 3 - EXECUTION

3.1 INSTALLERS [NOT USED]

3.2 EXAMINATION [NOT USED]

3.3 PREPARATION

A. General

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1. Remove trees, brush, stumps, and other objectionable material that will interfere with the construction of the erosion control measure.

B. Erosion Control Blanket

1. Remove rocks, dirt clods, stumps, and other objectionable material that will prevent the mat from lying in direct contact with the soil.

C. Mulching

1. Fertilize and treat soil prior to mulching installation when used with final vegetation.
   a. Fertilization and soil treatment are not required when using mulching with hydroseeding or when seed is spread during winter months.

D. Turf Reinforcement Mat

1. Remove rocks, dirt clods, stumps, and other objectionable material that will prevent the mat from lying in direct contact with the soil.

3.4 INSTALLATION

A. Silt Fence

1. Provide silt fence near the downstream perimeter of a disturbed area to intercept sediment from sheet flow.
2. Install posts 18 inches deep, maximum 6 feet on center.
3. Dig 6-inch x 6-inch trench on uphill side of fence and embed fabric and wire mesh. Backfill the trench.
4. Attach net reinforcement to posts with clips for steel posts or staples for wood posts in at least four equally spaced locations per post.
5. Fasten fabric to top of net reinforcement at a maximum spacing of 15 inches.
6. Locate splices in fabric at a post and provide a 3-foot overlap ensuring no leakage or bypass.
7. Install stone overflow structures at low points or spaced at approximately 300 feet if there is no apparent low point.
8. Turn last 10 feet of Silt Fence slightly uphill to prevent bypass.
9. Repair or replace any posts, net reinforcement, or fabric that are bent, torn, or otherwise unable to function as intended in accordance with this Section.

B. Check Dam

1. Place the aggregate to the lines, height, and slopes specified in the Drawings.
2. Place Check Dams perpendicular to the direction of flow.

C. Organic Filter Tube

1. Install Organic Filter Tubes near the downstream perimeter of a disturbed area to intercept sediment from sheet flow.
2. When placed on soil, excavate a 1-inch to 2-inch deep bedding trench along the length of the Organic Filter Tubes.
3. Secure Organic Filter Tubes using posts to prevent displacement as a result of normal rain events, damage to the logs, and flow from penetrating under the logs.
   a. Rock bags may be used in place of posts on paved surfaces.

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4. Overlap ends of Organic Filter Tubes by at least 18 inches and secure ends together preventing gaps from forming.
5. Turn last 10 feet of Organic Filter Tubes slightly uphill to prevent bypass.

D. Inlet Protection

1. Install prefabricated inlet protection systems in accordance with manufacturer's instructions.
2. Install filter fabric as specified in the Drawings and in accordance with this Section.
3. Install inlet protection systems to provide 2-inch overflow capability to allow storm water overflow during extreme storm events or when filter media on protection device clogs.

E. Erosion Control Blanket

1. Use an Erosion Control Blanket anywhere seeding is to be used and the slope is steeper than a 6:1 slope.
2. Use Turf Reinforcement Mat when stabilizing slopes of 2:1 or steeper.
3. Provide blanket on sod locations only when specified in the Drawings.
4. Dig 6 inch trench along the entire perimeter of the installation area.
5. Lay Erosion Control Blanket into trench and backfill with compacted soil.
6. Fasten Erosion Control Blanket in accordance with manufacturer's instructions.
7. Ensure staples are installed parallel to the direction of flow.
8. Overlap ends of Erosion Control Blanket by a minimum of 3 feet, and longitudinal edges by 6 inches.
9. Staple Erosion Control Blanket at all critical channel points and all overlaps.
10. ECBs shall be installed vertically down slope (across contours) on cut/fill slopes and embankments and along contours (parallel to flow) in swales and drainage ditches.
11. Unless the ECB is seeded to establish vegetation, perimeter applications shall be limited to thirty feet wide drainage areas (I.e. linear construction projects) for an 8 feet width of ECB.

F. Stabilized Construction Exit

1. Install stabilized construction exit as specified in the Drawings.
2. Install stabilized construction exits at any point where traffic will be leaving a construction site to or from a street, alley, sidewalk, or parking area.
3. Slope stabilized construction exit away from offsite paved surfaces or incorporate a drainage swale to prevent runoff from leaving the construction site.
4. Do not place stabilized construction exits at the lowest point on the construction site or on top of utility lines.
5. Minimum width of 15 feet for one-way and 20 feet for two-way.

G. Mulching

1. Spread organic mulch by hand or mechanical means providing complete, uniform coverage of the specified area.
2. Install mulching to a thickness between 1 to 2 inches.

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3. Anchor mulching by application of fiber mulch binder, synthetic mulch binder, using a tractor-drawn crimper to punch into the soil, or by placing netting above the mulch and stapled into the ground when placed on slopes of 3:1 or steeper.
4. Do not use mulching on slopes of 1.5:1 or steeper.

H. Pipe Inlet Sediment Trap

1. Install pipe inlet sediment trap as specified in the Drawings.
2. Provide a stormwater and sediment storage area upslope of the pipe inlet sediment trap to a minimum volume equal to the runoff calculated from the temporary control design storm.
3. Provide side slopes surrounding the storage area at 2:1 or flatter.
4. Install the pipe inlet sediment trap to a maximum height of half the inlet pipe diameter.
5. Install pipe inlet sediment trap to provide 2-inch overflow capability to allow storm water overflow during extreme storm events or when filter media on protection device clogs.

I. Stone Outlet Sediment Trap

1. Install stone outlet sediment trap as specified in the Drawings.
2. Provide a stormwater and sediment storage area upslope of the pipe inlet sediment trap to a minimum volume equal to the runoff calculated from the temporary control design storm.
3. Install the pipe inlet sediment trap to a maximum height of half the inlet pipe diameter.
4. Grade side slopes surrounding the storage area at 2:1 or flatter.
5. Install pipe inlet sediment trap to provide 2-inch overflow capability to allow storm water overflow during extreme storm events or when filter media on protection device clogs.

J. Turf Reinforcement Mat

1. Install turf reinforcement mats as specified in the Drawings and manufacturer's recommendations.
2. Install turf reinforcement mats immediately after completing grading of the slope or channel, and at most within 14 days after completing the grading.
3. Install turf reinforcement mats vertically down slope on steep cut/fill slopes, embankments, and steep channel slopes above the water surface level.
4. Install turf reinforcement mats horizontally (parallel to flow) for channel slopes below the water surface level.
5. Dig 6 inch trench along the entire perimeter of the installation area.
6. Lay turf reinforcement mat into trench and backfill with compacted soil.
7. Fasten turf reinforcement mat in accordance with manufacturer's instructions.
8. Ensure staples are installed parallel to the direction of flow.
9. Overlap ends of turf reinforcement mat by a minimum of 3 feet, and longitudinal edges by 6 inches.
10. Staple turf reinforcement mat at all critical channel points and all overlaps.

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3.5 REPAIR

1. Repair any controls determined to no longer be functioning as intended in accordance with this Section.
2. Repair devices as soon as exposed ground has dried sufficiently to prevent further damage from equipment operations needed for repairs.

3.6 RE-INSTALLATION [NOT USED]

3.7 FIELD QUALITY CONTROL

A. Field Inspections

1. Inspect all storm water pollution prevention controls at least once every 7 calendar days.
2. Inspect dewatering pumps and sediment controls hourly while pumps are in operation.

3.8 SYSTEM STARTUP [NOT USED]

3.9 ADJUSTING [NOT USED]

3.10 CLEANING [NOT USED]

3.11 CLOSEOUT ACTIVITIES [NOT USED]

3.12 PROTECTION [NOT USED]

3.13 MAINTENANCE

A. General

1. If a storm water pollution prevention control ceases to function as intended, repair and replace the device or any portions necessary. Repeated failure indicates a device is insufficient and additional or different Erosion and Sediment Control devices must be selected.
2. Remove sediment, debris, and litter from all devices as necessary to maintain intended operation.
3. Continue maintenance of all erosion and sediment control devices until vegetative cover reaches 70 percent density, as determined by the City.

B. Check Dam

1. Remove silt when it reaches a depth equal to one-third the height of the dam or one foot, whichever is less.

C. Dewatering Controls

1. Repair areas eroded due to dewatering pumping and install erosion control devices to prevent further erosion.
2. Clean sediment tanks when they become half full of sediment.

3.14 ATTACHMENTS [NOT USED]

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2 **END OF SECTION**

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Revision Log		
DATE	NAME	SUMMARY OF CHANGE
6/14/24		Added ESA protection measures to Section 1.4; Removed Watershed Protection individual contact information from Section 1.4
6/14/24		Removed organic filter tubes and rock bags from inlet protection under 3.4.D
6/14/24		Removed presence of Watershed Protection from inspection requirement under 3.7

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SECTION 32 11 23
FLEXIBLE BASE COURSES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Foundation course for surface course or other base course composed of flexible base constructed in one or more courses in accordance with the typical section specified in the Drawings.

B. Deviations from this City of Denton Standard Specification:

1. None.

C. Related Specification Sections include but are not limited to:

1. Division 0 - Bidding Requirements, Contract Forms, and Conditions of the Contract.
2. Division 1 - General Requirements.
3. Section 32 05 16 – Aggregates for Exterior Improvements.

1.2 PRICE AND PAYMENT PROCEDURES

A. Measurement and Payment

1. Flexible Base
   a. Measurement
      1) Measured by the square yard of Flexible Base Course installed.
   b. Payment
      1) The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid per square yard for Flexible Base Course installed for:
         a) Various depths.
         b) Various grades.
         c) Various types.
   c. The price bid shall include:
      1) Furnishing and installing Flexible Base Course as specified by the Drawings
      2) Loading
      3) Unloading
      4) Hauling
      5) Storing
      6) Disposal of excess materials
2. Rework
   a. Payment
      1) Material used and work performed for reworking will not be paid for directly but will be subsidiary to original item bid.

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1.3 REFERENCES

A. Definitions
   1. RAP – Recycled Asphalt Pavement.

B. Reference Standards
   1. Reference standards cited in this Section refer to the current reference standard published at the time of the latest revision date logged at the end of this Section unless a date is specifically cited.
   2. ASTM International (ASTM):
      a. D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft3 (600 kN-m/m3))
      b. D6938, Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
   3. Texas Department of Transportation (TxDOT) Test Procedures:
      a. Tex-104-E, Determining Liquid Limits of Soils
      b. Tex-106-E, Calculating the Plasticity Index of Soils
      c. Tex-107-E, Determining the Bar Linear Shrinkage of Soils
      d. Tex-110-E, Particle Size Analysis of Soils
      e. Tex-116-E, Ball Mill Method for Determining the Disintegration of Flexible Base Material
      f. Tex-117-E, Triaxial Compression for Disturbed Soils and Base Materials
      g. Tex-140-E, Measuring Thickness of Pavement Layer
      h. Tex-411-A, Soundness of Aggregate Using Sodium Sulfate or Magnesium Sulfate
      i. Tex-413-A, Determining Deleterious Material in Mineral Aggregate

1.4 ADMINISTRATIVE REQUIREMENTS [NOT USED]

1.5 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00.

B. All submittals shall be approved by the City prior to delivery of materials.

1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS

A. Informational Submittals
   1. Proposed source and supplier of flexible base material.
   2. Equipment Information
      a. Submittal for all major equipment to include:
         1) Equipment name and description
         2) Size
         3) Intended use

1.7 CLOSEOUT SUBMITTALS

A. Test and Evaluation Reports
   1. All test reports generated during testing.

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1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]

1.9 QUALITY ASSURANCE [NOT USED]

1.10 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Acceptance Requirements

1. Deposit material directly on subgrade and spread and shape same day.

B. Storage and Handling Requirements

1. Secure and maintain a location to store the material in accordance with Section 01 66 00.
2. Stockpiling
   a. When required, stockpile base material at a location approved by City.
   b. Create stockpiles in layers no greater than 2 feet thick.
   c. Stockpile must have a total height between 6 feet and 12 feet.
   d. Do not load material from stockpile until City has approved stockpile construction.
   e. Load by making successive vertical cuts through the entire depth of the stockpile.

1.11 FIELD CONDITIONS [NOT USED]

1.12 WARRANTY [NOT USED]

PART 2 - PRODUCTS

2.1 CITY-FURNISHED PRODUCTS

A. Existing Products

1. Recycled Concrete
   a. Recycled concrete may only be used in Type D Flexible Base when obtained from the City.
      1) Coordinate with City regarding quantity available for use in the Work.
         a) Contractor will not be entitled to additional payment or to submit a Contract Claim if recycled concrete is not available for their use.
   b. City-furnished recycled concrete is not subject to the requirements of Table 1.
   c. The final blended product will be subject to the requirements of Table 1.

2.2 MATERIALS

A. General

1. Furnish uncontaminated materials of uniform quality in accordance with this Section and as specified in the Drawings.
2. Notify City of changes to material sources.
3. The City may sample and test project materials at any time before compaction throughout the duration of the project to assure materials accordance with this Section.

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B. Aggregates

1. Furnish aggregate of the type and grade specified in the Drawings and in accordance with the requirements of Table 1.
2. If blending of sources is approved by the City, ensure each source is in accordance with the requirements of Table 1.
3. Do not use additives, such as but not limited to lime, cement, or fly ash to modify aggregates to meet the requirements of Table 1 unless approved by the City.
   a. Additives may be used during final placing as directed by the geotechnical report.

Table 1
Material Requirements

Property	Test Method	Grade 1	Grade 2
Master gradation sieve size (% retained)	Tex-110-E		
2-1/2 in.		–	0
1-3/4 in.		0	0–10
7/8 in.		10–35	–
3/8 in.		30–50	–
No. 4		45–65	45–75
No. 40		70–85	60–85
Liquid limit, % max.[1]	Tex-104-E	35	40
Plasticity index, max.[1]	Tex-106-E	10	12
Wet ball mill, % max.[2]	Tex-116-E	40	45
Wet ball mill, % max. increase passing the No. 40 sieve		20	20
Classification[3]	Tex-117-E	1.0	1.1–2.3
Min. compressive strength[3], psi lateral pressure 0 psi lateral pressure 15 psi		 45 175	 35 175

1. Determine plastic index in accordance with Tex 107-E (linear shrinkage) when liquid limit is unattainable as defined in Tex 104-E.
2. When a soundness value is required by the Drawings, test material in accordance with Tex 411-A.
3. Meet both the classification and the minimum compressive strength, unless otherwise shown on the Drawings.

C. Flexible Base Types

1. Type A
   a. Flexible Base Course consisting of limestone aggregate obtained from single, naturally occurring source in accordance with Section 32 05 16.
   b. Do not use gravel or recycled materials in Type A Flexible Base Course.
2. Type B
   a. Flexible Base Course consisting of limestone aggregate obtained from two or more naturally occurring sources in accordance with Section 32 05 16.
   b. Do not use gravel or recycled materials in Type B Flexible Base Course.
3. Type D
   a. Flexible Base Course consisting of Type A material in addition to up to 30% recycled material.

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b. Ensure final blended material is in accordance with the requirements of Table 1.

D. Recycled Materials

1. General
   a. Obtain City approval prior to using any recycled materials.
   b. Furnish recycled materials free from reinforcing steel and other objectional material.
   c. Furnish recycled materials with at most 1.5 percent deleterious material when tested in accordance with TEX-413-A.
2. Recycled Asphalt Pavement (RAP)
   a. Up to 30% of Flexible Base Course material may be RAP when approved by the City.
   b. Crush RAP such that 100% passes the 2 inch sieve.

E. Water

1. Furnish water free of industrial wastes and other objectionable material.

2.3 ACCESSORIES [NOT USED]

2.4 SOURCE QUALITY CONTROL [NOT USED]

PART 3 - EXECUTION

3.1 INSTALLERS [NOT USED]

3.2 EXAMINATION [NOT USED]

3.3 PREPARATION

A. Surface Preparation

1. Shape subgrade or existing base to the lines and elevations indicated in the construction plans according to the typical sections specified in the Drawings or as directed by City.
2. Proof roll subgrade material and correct soft spots as directed.
3. Remove unsuitable soil or material and replace with acceptable soil.
4. When material is imported from a borrow source, manipulate and thoroughly mix new base with existing material to provide uniform mixture before shaping.

B. Demolition / Removal

1. Remove existing pavement in accordance with Section 02 41 15 as specified in the Drawings.

3.4 INSTALLATION

A. General

1. Construct each layer uniformly, free of loose or segregated areas, and with the required density and moisture content.
2. Maximum layer depth of flexible base course in single layer not to exceed 6 inches.
3. Minimum layer depth of flexible base course is 2 inches.

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4. Where subbase or base course exceeds 6 inches in thickness, construct in 2 or more courses of equal thickness not exceeding 4 inches.
5. Provide a smooth surface in accordance with the typical sections, lines, and grades specified in the Drawings or as directed by City.

B. Equipment

1. Provide machinery, tools, and equipment necessary for proper execution of the work.
2. Compaction
   a. A roller is required for all compaction operations. The roller must have adequate weight and dimensions to achieve the required compaction. A roller shall be deemed acceptable if it can consistently achieve the desired results for flexible base placement.
   b. Sheepsfoot rollers are not allowed.
   c. Alternate Equipment
      1) Contractor may use alternative compaction equipment that produces equivalent results if approved by City prior to use. Discontinue use of the alternate equipment and furnish the specified equipment if the desired results are not achieved.
      2) City may require Contractor to substitute equipment if production rate and quality requirements of the Contract Documents are not met.

C. Placement

1. Spread and shape flexible base into a uniform layer by approved means the same day as delivered unless otherwise approved by City.
2. Move all material from the location in which it is deposited no more than once.
3. Place material such that it is mixed to minimize segregation.
4. Construct layers to the thickness specified in the Drawings while maintaining the shape of the course.
5. Control dust by sprinkling.
6. Correct or replace segregated areas as directed.
7. Place successive base courses and finish courses using the same construction methods required for the first course.
8. When required to use multiple lifts, ensure successive base courses and finish courses are placed such that section breaks do not align.

D. Compaction

1. Compact using density control unless otherwise specified in the Contract Documents.
2. Bring each layer to the moisture content directed. When necessary, sprinkle the material to the extent necessary to provide not less than the required density as specified in this Section.
3. Compact the full depth of the subbase or base to the extent necessary to remain firm and stable under construction equipment.
4. Density Control

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a. Compact until the entire depth of the mixture has achieved a uniform density not less than 98 percent of the maximum density as determined by ASTM D698.
b. Final moisture content shall be plus or minus 2 percent of optimum.

E. Finishing

1. After completing compaction, clip, skin, or tight-blade surface with a maintainer or subgrade trimmer to a depth of approximately 1/4 inch.
2. Remove loosened material and dispose of it at an approved location.
3. Seal the clipped surface immediately by rolling with an appropriate size pneumatic tire roller until a smooth surface is attained.
4. Add small increments of water as needed during rolling.
5. Shape and maintain the course and surface in accordance with the typical sections, lines, and grades as specified in the Drawings or as directed by the City.
6. In areas where surfacing is to be placed, correct grade deviations greater than 1/4 inch in 16 feet measured longitudinally or greater than 1/4 inch over the entire width of the cross-section.

3.5 REPAIR [NOT USED]

3.6 RE-INSTALLATION

A. Reworking a Flexible Base Section

1. Rework any constructed course which fails to meet the requirements of this Section.
2. Reworking includes loosening, adding material or removing unacceptable material if necessary, mixing as directed, compacting, and finishing.

3.7 FIELD QUALITY CONTROL

A. Field Test and Inspections

1. Test in accordance with Section 01 45 23.
2. Density Test
   a. City must be on site during density testing
   b. Measure density of flexible base course in accordance with ASTM D6938.
   c. Measure density every 100' along corridor or as directed by City.
   d. City to determine density testing locations.
3. Depth Test
   a. City must be on site during density testing
   b. Measure depth of flexible base course in accordance with Tex-140-E in hand excavated holes.
   c. Measure depth every 300' along corridor or as directed by City.

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3.8 SYSTEM STARTUP [NOT USED]

3.9 ADJUSTING [NOT USED]

3.10 CLEANING [NOT USED]

3.11 CLOSEOUT ACTIVITIES [NOT USED]

3.12 PROTECTION [NOT USED]

3.13 MAINTENANCE

A. Maintain the completed flexible base in good condition, satisfactory to the City as to grade, crown, and cross section until the overlaying or next course is constructed.

3.14 ATTACHMENTS [NOT USED]

END OF SECTION

Revision Log		
DATE	NAME	SUMMARY OF CHANGE
6/14/2024		Eliminated 0.2 ft tolerance on subgrade elevations; 3.3.A.1
6/14/2024		Removed sheepsfoot roller for compaction; 3.4.B.2

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SECTION 32 13 13
CONCRETE PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Material requirements and construction methods for:
   a. Concrete pavement classes
   b. Concrete pavement
   c. Concrete street header

B. Deviations from this City of Denton Standard Specification:

1. None.

C. Related Specification Sections include but are not limited to:

1. Division 0 - Bidding Requirements, Contract Forms, and Conditions of the Contract.
2. Division 1 - General Requirements.
3. Section 03 00 00 – Concrete and Concrete Reinforcing.
4. Section 32 01 29 – Concrete Paving Repair.
5. Section 32 05 16 – Aggregates for Exterior Improvements.
6. Section 32 13 73 – Concrete Paving Joint Sealants.
7. Section 41 14 00 – Batching Equipment.

1.2 PRICE AND PAYMENT PROCEDURES

A. Measurement and Payment

1. Concrete Pavement
   a. Measurement
      1) Measured per square yard from back of curb to back of curb or edge of concrete to edge of concrete for Concrete Pavement installed.
   b. Payment
      1) The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid per square yard for Concrete Pavement installed for:
         a) Various depths.
   c. The price bid shall include:
      1) Furnishing and installing Concrete Pavement as specified by the Drawings
      2) Shaping and fine grading the placement area
      3) Water
      4) Loading
      5) Unloading
      6) Storing
      7) Hauling
      8) Handling of materials

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9) Traffic control for all testing
10) Trial batches (as needed)
11) Materials and work needed for any corrective action
12) Concrete
13) Aggregate
14) Supplementary cementing materials
15) Concrete additives
16) Mixing
17) Placement of concrete
18) Finishing of concrete
19) Curing and curing compounds
20) Sawing
21) Joint sealant
22) Reinforcing steel and reinforcement chairs
23) Disposal of excess material
24) Clean-up

2. Concrete Pavement (HES)
   a. Measurement
      1) Measured per square yard from back of curb to back of curb or edge of concrete to edge of concrete for Concrete Pavement (HES) installed.
   b. Payment
      1) The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid per square yard for Concrete Pavement (HES) installed for:
         a) Various depths.
   c. The price bid shall include:
      1) Furnishing and installing Concrete Pavement (HES) as specified by the Drawings
      2) Shaping and fine grading the placement area
      3) Water
      4) Loading
      5) Unloading
      6) Storing
      7) Hauling
      8) Handling of materials
      9) Traffic control for all testing
      10) Trial batches (as needed)
      11) Materials and work needed for any corrective action
      12) Concrete
      13) Aggregate
      14) Supplementary cementing materials
      15) Concrete additives
      16) Mixing
      17) Placement of concrete
      18) Finishing of concrete
      19) Curing and curing compounds
      20) Sawing
      21) Joint sealant
      22) Reinforcing steel and reinforcement chairs

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23) Disposal of excess material
24) Clean-up

3. Concrete Street Header
   a. Measurement
      1) Measured per linear foot of Concrete Street Header installed.
   b. Payment
      1) The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid per linear foot for Concrete Street Header installed.
   c. The price bid shall include:
      1) Furnishing and installing Concrete Street Header as specified by the Drawings
      2) Shaping and fine grading the placement area
      3) Water
      4) Loading
      5) Unloading
      6) Storing
      7) Hauling
      8) Handling of materials
      9) Traffic control for all testing
      10) Trial batches (as needed)
      11) Materials and work needed for any corrective action
      12) Concrete
      13) Aggregate
      14) Supplementary cementing materials
      15) Concrete additives
      16) Mixing
      17) Placement of concrete
      18) Finishing of concrete
      19) Curing and curing compounds
      20) Sawing
      21) Joint sealant
      22) Reinforcing steel and reinforcement chairs
      23) Disposal of excess material
      24) Clean-up

1.3 REFERENCES

A. Abbreviations and Acronyms

1. ACI – American Concrete Institute
2. AASHTO – American Association of State Highway and Transportation Officials
3. ASTM – American Society for Testing and Materials
4. HES – High Early Strength
5. TxDOT – Texas Department of Transportation
6. W/C – Water to cement ratio
7. SCM – Supplementary Cementing Materials
8. UFFA – Ultra-Fine Fly Ash

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9. MFFA – Modified Class F Fly Ash
10. PSI – Pounds per Square Inch
11. KSI – Kilopound per Square Inch

B. Reference Standards

1. Reference standards cited in this Section refer to the current reference standard published at the time of the latest revision date logged at the end of this Section unless a date is specifically cited.
2. American Association of State Highway and Transportation Officials (AASHTO)
   a. AASHTO T26, Standard Method of Test for Quality of Water to be Used in Concrete
3. American Society for Testing and Materials (ASTM):
   a. C31, Standard Practice for Making and Curing Concrete Test Specimens in the Field
   b. C39, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
   c. C42, Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
   d. C1602, Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete
4. American Concrete Institute (ACI):
   a. ACI 305.1-14, Standard Specification for Hot Weathering Concreting
   b. ACI 306.1-90, Standard Specification for Cold Weathering Concreting
   c. ACI 301-16, Specifications for Structural Concrete
   d. ACI 318, Building Code Requirements for Structural Concrete
5. Texas Department of Transportation (TxDOT) Departmental Material Specifications (DMS)
   a. DMS–4515, Multiple-Piece Tie Bars for Concrete Pavement
   b. DMS–4600, Hydraulic Cement
   c. DMS–4640, Chemical Admixtures for Concrete
   d. DMS–4650, Hydraulic Cement Concrete Curing Materials and Evaporation Retardants
   e. DMS–6100, Epoxies and Adhesives
   f. DMS-6310, Joint Sealants and Fillers
6. TxDOT Test Procedures:
   a. Tex-422-A, Measuring Temperature of Freshly Mixed Portland Cement
   b. Tex-423-A, Determining Concrete Thickness by Direct Measurement
   c. Tex-424-A, Obtaining and Testing Drilled Cores of Concrete
   d. Tex-470-A, Optimized Aggregate Gradation for Hydraulic Cement Concrete Mix Designs
   e. Tex-472-A, Uniformity of Concrete
   f. Tex-612-J, Acid Insoluble Residue for Fine Aggregate

1.4 ADMINISTRATIVE REQUIREMENTS

A. Pre-Paving Meeting

1. Hold meeting 1 week prior to performing any tasks included under Concrete Paving.

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2. Invite the City and appropriate representatives.
3. Prior to pre-paving meeting, prepare the following:

a. Paving Plan
1) Paving widths
2) Jointing plan:
a) Locations and labels for all joint types including longitudinal and transverse construction joint locations
3) Confirm rebar sizes for pavement reinforcing.
4) Confirm hand-pour location and equipment to be used for forming, pouring, compacting, and finishing concrete.
5) Texturizing method (broom or tining) and direction (longitudinal or transverse)
6) Consolidation methods at joints

b. Paving Process
1) Process to balance production, delivery, paving, and compaction to achieve continuous placement operations and good ride quality.

c. All Action and Information Submittals to be reviewed and approved prior to Pre-Paving Meeting.

4. During the Pre-Paving Meeting, determine whether tining or a broom finish is preferred by the City unless otherwise specified in the Drawings.

B. Night Work and Noise
1. Comply with all City Noise Ordinance in accordance with the General Conditions.
2. Night work will require prior City approval in accordance with the General Conditions.

1.5 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00.

B. All submittals shall be approved by the City prior to commencement of any Concrete Paving activities.

1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS

A. Shop Drawings:
1. Concrete Mix Design
a. In accordance with Section 03 00 00.
b. Statement from the concrete supplier verifying concrete has been tested and handled in accordance with ASTM C94.
2. Jointing Layout
a. Provide a jointing layout if one is not provided in the Drawings.
3. Product Data
a. Provide the following from each manufacturer supplying the following in accordance with Section 03 00 00:
1) Curing compounds
2) Evaporation retardant
3) Joint fillers
4) Chemical additives

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5) Epoxy

B. Informational Submittals:

1. Source Locations
   a. Location of all material sources
2. Testing Laboratory
   a. Submit for review and approval the following information for each testing laboratory used on the project:
      1) Testing Laboratory Name
      2) Location
      3) What tests will be performed at the lab if multiple labs are used.
      4) ACI Certification – All labs and Contractor personnel performing concrete testing must be ACI certified.
3. Equipment Information
   a. Submittal for all major equipment to include:
      1) Equipment name and description
      2) Size
      3) Intended use

1.7 CLOSEOUT SUBMITTALS

A. Test and Evaluation Reports

1. All test reports generated during testing.

1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]

1.9 QUALITY ASSURANCE [NOT USED]

1.10 DELIVERY, STORAGE, AND HANDLING

A. Secure and maintain a location to store the material in accordance with Section 01 66 00.

B. Storage and Stockpiling

1. Cement and Supplementary Cementitious Material
   a. In accordance with Section 03 00 00.
2. Steel Reinforcement
   a. Store reinforcement above ground surface on skids, platforms, or other support.
   b. Protect reinforcement from mechanical damage and surface deterioration caused by exposure to conditions that could cause rust.
3. Chemical Admixture, Epoxy, Curing Compound, and Other Materials
   a. Follow manufacturer's instructions regarding storage and application at temperatures of material.
4. Epoxy
   a. Package components in airtight containers and protect from light and moisture.
   b. Include detailed instructions for the application of the material and all safety information and warnings regarding contact with the components.
   c. Store epoxy and adhesive components at temperatures recommended by the manufacturer.

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1.11 FIELD CONDITIONS

A. Weather Conditions

1. Do not place concrete when the ambient temperature in the shade is below 40 degrees Fahrenheit and falling unless approved in writing by the City.
2. Concrete may be placed when the ambient temperature in the shade is above 35 degrees Fahrenheit and rising or above 40 degrees Fahrenheit.
3. Protect the pavement with an approved insulating material capable of protecting the concrete for the specified curing period when temperatures warrant protection against freezing.
4. Submit proposed measure to protect the concrete from anticipated freezing weather for the first 72 hours after a concrete pour to the City for review.
5. Repair or replace all concrete damaged by freezing at no cost to the City.

1.12 WARRANTY [NOT USED]

PART 2 - PRODUCTS

2.1. CITY-SUPPLIED PRODUCTS [NOT USED]

2.2. MATERIALS

A. Concrete Production Materials

1. Produce Class P1, P2, or HES concrete for concrete paving in accordance with 03 00 00.
   a. Temperature
      1) Pour concrete that is between 40 degrees and 95 degrees Fahrenheit when measured in accordance with Tex-422-A at the time of discharge.
      2) Take immediate corrective action or cease concrete placement when the concrete temperature exceeds 95 degrees Fahrenheit.
2. Provide Cementitious Material and Water in accordance with Section 03 00 00.
3. Aggregate
   a. General
      1) Recycled crushed concrete may be used as coarse or fine aggregate in Class A, B, E, and P concrete.
      2) A maximum of 20 percent of the fine aggregate may consist of recycled crushed concrete.
   b. Coarse Aggregates
      1) Provide coarse aggregate in accordance with Tex-470-A and Section 03 00 00 for P1, P2, or HES concrete based on the concrete classes specified on the Drawings.
   c. Fine Aggregates
      1) Fine aggregate will consist of clean, hard, durable fragments in accordance with Section 32 05 16.

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2) Use fine aggregate with an acid insoluble residue of at least 60 percent by weight when tested in accordance with Tex-612-J in all concrete subject to direct traffic.

3) Use the following equation to determine if aggregate combination meets the acid insoluble residue requirement when blending fine aggregate:

$$\frac{(A_1 \times P_1) + (A_2 \times P_2)}{100} \geq 60 \text{ percent}$$

Where:

A_1 = acid insoluble (percent) of fine aggregate 1

A_2 = acid insoluble (percent) of fine aggregate 2

P_1 = percent by weight of fine aggregate 1 of the fine aggregate blend

P_2 = percent by weight of the fine aggregate 2 of the fine aggregate blend

a) Instead of using the above equation, the following blending may be done.

(1) Blend fine aggregate with a micro-deval loss of less than 12 percent when tested in accordance with Tex-461-A with at least 40 percent of a fine aggregate that has an acid insoluble residue of at least 60 percent.

4) Provide fine aggregates in accordance with gradation shown in Table 1.

Table 1
Fine Aggregate Gradation Chart

Sieve Size	Percent Passing by Weight
3/8"	100
#4	95–100
#8	80–100
#16	50–85
#30	25–65
#50	10–35[1]
#100	0–10
#200	0–3[2]

1. 6 – 35 when sand equivalent value is greater than 85 when tested in accordance with Tex-203-F.
2. 0 – 6 for manufactured sand.

4. Chemical Admixtures
   a. General
      1) Provide chemical admixtures in accordance with Section 03 00 00.
   b. Water Reducing Admixture
      1) Provide water-reducing admixtures in accordance with Section 03 00 00.
   c. Air-Entraining Admixture
      1) Provide air-entraining admixtures in accordance with Section 03 00 00.

B. Concrete Placement Materials

1. Reinforcing Steel
   a. Provide in accordance with Section 03 00 00.

2. Tie Bars
   a. General

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1) Provide in accordance with Section 03 00 00.
2) Use tie bars in longitudinal contraction and longitudinal construction joints.
3) Use support baskets to support the tie bars during concrete placement. Do not use chairs or other support devices without prior approval from the City.
4) Refer to this Section for installation requirements.

b. Multiple Piece Tie Bars
1) Use multiple piece tie bars along all longitudinal construction joints unless otherwise approved by the City.
2) Do not use multiple piece tie bars for contraction joints or any transverse joints.
3) Provide multiple piece tie-bars conforming to DMS-4515.

c. Single Piece Tie Bars
1) Use single piece tie bars for contraction joints only.
2) Single piece tie bars will only be accepted for longitudinal construction joints when the existing concrete is already hardened in widening projects or when performing maintenance work such as panel replacement or concrete repair.

3. Dowel Bars
a. General
1) Provide dowel bars and dowel caps in accordance with Section 03 00 00.
2) Use dowel bars in transverse contraction joints and expansion joints.
3) Refer to this Section for installation requirements.

4. Reinforcement Supporting Devices
a. Provide in accordance with Section 03 00 00.

5. Epoxy
a. Provide in accordance with Section 03 00 00.

6. Evaporation Retardant
a. Provide in accordance with Section 03 00 00.

7. Curing
a. Provide in accordance with Section 03 00 00.

8. Joint Fillers (Expansion Joints)
a. Provide boards at the size, shape, and type specified in the Drawings. Use redwood if the type of board is not specified in the Drawings.
1) Provide redwood timber boards for expansion joints in accordance with DMS-6310.
b. Provide wood boards free of deformities and are smooth, flat, straight throughout, and sufficiently rigid to allow for easy installation.

9. Joint Sealants
a. Provide joint sealants in accordance with Section 32 13 73.

2.3. ACCESSORIES [NOT USED]

2.4. SOURCE QUALITY CONTROL

A. Tests and Inspections
1. Material Source Testing and Submittals

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a. Resubmit Action Submittals affected if any material source locations or concrete supplier is changed.

b. Cementitious Materials
   1) Provide manufacturer testing reports in accordance with this Section.
   2) Perform testing in accordance with DMS-4600
   3) Furnish in accordance with Section 03 00 00.

c. Water
   1) Perform testing to verify the water is in accordance with the requirements of AASHTO T26.
   2) Mix water in accordance with ASTM C1602.

d. Aggregate Quality Requirements
   1) Provide aggregates in accordance with all requirements in Section 32 05 16 and this Section.

e. Chemical Admixtures
   1) Provide manufacturer testing reports in accordance with this Section.
   2) Perform testing in accordance with DMS-4640

f. Epoxy, Evaporation Retardants, Curing Compounds, Joint Fillers, and Joint Sealants
   1) Provide manufacturer testing reports and product data in accordance with this Section.
   2) Perform testing in accordance with DMS-4650, DMS-6100, and DMS-6310.

PART 3 - EXECUTION

3.1. INSTALLERS [NOT USED]

3.2. EXAMINATION [NOT USED]

3.3. PREPARATION

A. Class P1, P2, and HES Preparation

1. Hauling
   a. Clean delivery equipment as necessary to prevent accumulation of old concrete before loading fresh concrete.
   b. Deliver concrete to the site in accordance with Section 41 1400.
   c. Maintain concrete delivery and placement rates to prevent cold joints and in accordance with Section 03 00 00.
   d. Any concrete not placed within the time limits specified under Section 03 0000 will be rejected.
   e. Adding Water or Chemical Admixtures
      1) Adding chemical admixtures is not permitted at the jobsite.
      2) Water may be added to the truck until the slump test is conducted. Once the slump test is conducted, the addition of water or admixtures is not permitted unless the slump is too low or otherwise permitted.
      3) When water or an admixture is added, turn the drum or blades at least 30 additional revolutions at mixing speed to ensure thorough and uniform mixing of the concrete.

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4) When water is added, do not exceed the approved mix design water to cementitious material ratio.
5) Do not add water or chemical admixtures after any concrete has been discharged.

f. Provide the delivery ticket for the concrete in accordance with Section 41 14 00.

2. Subgrade

a. Hot-Mix Asphalt Base
1) Prepare surface by removing, sweeping, or other approved methods.

b. Lime, Cement or Flexible Base Subgrade:
1) Correct all irregularities in the subgrade of more than 1/2 inch., as shown by straightedge or template.
2) Verify subgrade meets all requirements for the applicable subgrade type.
3) Spray prepared subgrade with water, if needed, in advance of placing the pavement to ensure it is in a firm and moist condition.
4) Take density tests no more than 72-hours prior to placement of concrete.

c. If rain or other conditions may have adversely affected the condition of the subgrade or base, additional tests may be required as directed by the City.

3.4. INSTALLATION

A. Class P1, P2, and HES Equipment

1. General

a. Furnish and maintain all equipment necessary for the construction of concrete pavement in good working condition.

b. The equipment to include spreading devices (augers), internal vibration, tamping, and surface floating necessary to finish the freshly placed concrete shall provide a dense and homogeneous pavement.

2. Forming Equipment

a. Pavement Forms
1) Pavement forms shall only be used when hand-pouring concrete. Use a slip-form paver for all machine-poured concrete unless otherwise approved by the City.
2) Provide metal or wood side forms unless otherwise approved by the City.
3) Provide side forms of sufficient cross-section, strength, and rigidity to support paving equipment and resist the impact and vibration of the operation without visible springing, settling, or deflection.
4) Use forms that extend the full depth of concrete and shall be:
a) a minimum of 1.5 inches in thickness when wooden forms are used
b) of a gauge that provides equivalent rigidity and strength when metal forms are used.
5) Use forms that are clean, oiled, and free from detrimental kinks, bends, or warps that could affect ride quality or alignment.
6) Provide flexible or curved forms made of metal or wood for curves that have a radius of 250 feet or less.
7) Secure forms on a base or firm subgrade accurately graded and that provides stable support without deflection and movement.
8) Pin every form at a minimum in the middle and near each end. Tightly join and key form sections together to prevent displacement.

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9) Forms to be reset using heavy stakes or other additional supports if subgrade becomes unstable.
10) Obtain approval of formwork from the City prior to placement of concrete.
11) Forms are to be placed to provide pavement at final grade as specified in the Drawings.
12) Check conformity of the grade, alignment, and stability of forms immediately before pouring concrete and make necessary corrections.
13) Use a straight edge or other approved method to test the top of forms to ensure ride quality requirements for the completed pavement will be met.
14) Submit a request to the City for any alternative pavement form equipment for review.

b. Curb Forms
1) Provide curb forms for separately placed curbs not slip-formed in accordance with the requirements of Section 31 16 00.

c. Settling
1) Stop paving operations if forms settle or deflect more than 1/8 inch under finishing operations.
2) Reset the forms and refinish concrete surface to correct grade.

3. Paving, Consolidating, and Finishing Equipment
a. Do not add water to concrete after discharged from delivery equipment unless approved by the City.
b. Misting/fogging only allowed during Finishing. Refer to this Section for additional information.
c. Machine-Poured Concrete Pavement
1) Use a slip-form paver with a stringline that uniformly distributes the concrete with minimal segregation and provides a smooth finish in accordance with the plan line and grade for machine-poured concrete.
2) The Contractor is responsible for establishing the location and elevation of the stringline to ensure pavement will be at the correct final grade specified in the Drawings.
3) Provide mechanically-operated finishing floats capable of producing a uniformly smooth pavement surface.
4) Provide watering equipment capable of providing a fine, light, water fog mist.
5) Provide a stake line for the stringline every 25 feet and at every horizontal and vertical geometry point as specified in the Drawings.
d. Hand-Poured Concrete Pavement
1) Receive approval of all equipment used for hand-pouring concrete during Pre-Paving Meeting.
2) Refer to this Section for additional requirements.
e. Consolidating
1) Provide mechanically-operated vibratory equipment capable of adequately consolidating the concrete.
2) Provide immersion vibrators on paving equipment at sufficiently close intervals to provide uniform vibration and consolidation of the concrete over the entire width and depth of the pavement and in accordance with the manufacturer's recommendations.
3) Provide immersion vibrator units that operate at a frequency in air of at least 8,000 cycles per minute on the paving equipment.

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4) Provide enough hand-operated immersion vibrators for timely and proper consolidation of the concrete along forms, at all joints, and in areas not covered by other vibratory equipment.
5) Surface vibrators may be used to supplement equipment-mounted immersion vibrators.
6) Provide tachometers to verify the proper operation of all vibrators.

f. Finishing
1) Floats
a) Use a float attached to the slip-form paver or as a separate machine where possible.
b) When using a hand float or trowel, take care to not distort the surface. The City may require any concrete that has a non-uniform surface due to the improper use of a float to be removed and replaced at no cost to the City.
2) Straightedge
a) Use a 10 or 15 foot long square tube straightedge made of magnesium or steel.
b) The City may require any concrete that has a non-uniform surface due to the improper use of a straightedge to be removed and replaced at no cost to the City.

4. Texturing Equipment
a. A baker broom or tining are the approved methods for texturizing concrete.
b. Provide a baker broom of sufficient transverse length to span the full width of pavement being placed.
c. Request approval to use an evaporation retardant if there is concern the concrete surface will dry too quickly before texturing and curing can occur.
d. Tining Equipment
1) Provide a self-propelled metal tine device equipped with steel tines to obtain groves that are 1/12-inch-wide and a depth of 1/8 inch to 3/16 inch.
2) Tine Spacing:
a) Transverse tining spaced at approximately 1-inch center-to-center.
3) Manual methods may be used that produce an equivalent texture when it is impractical to use self-propelled equipment. However, manual methods should be minimized. Obtain approval before using manual tining methods.

5. Curing Equipment
a. Provide a self-propelled machine for applying membrane curing compound using mechanically-pressurized spraying equipment with atomizing nozzles where possible.
b. If manually applying a curing compound, use equipment with a nozzle capable of producing the desired coverage based on the requirements of this specification.
c. Provide equipment and controls that maintain the required uniform rate of application over the entire paving area.
d. When reinforcing is exposed, provide plastic covers to prevent the bars from being coated in curing compound. Remove any curing compound on exposed reinforcing with a steel brush or by sand blasting.

6. Sawing Equipment
a. Provide power-driven concrete saws to saw joints specified in the Drawings.

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7. Grinding Equipment
   a. Provide grinding equipment specifically designed to smooth and texture concrete pavement using circular diamond blades when required.
   b. Provide equipment with an automatic grade control capable of grinding at least a 3-foot width longitudinally in each pass without damaging the concrete.
8. Coring Equipment
   a. Provide coring equipment capable of extracting cores in accordance with Tex-424-A.
9. Miscellaneous Equipment
   a. Provide both a 5-foot and a 10-foot steel or magnesium long-handled, standard straightedge.
   b. Provide enough work bridges long enough to span the pavement for finishing and inspection operations.
10. The City may reject equipment and stop operation if equipment does not meet requirements.

B. Class P1, P2, and HES Concrete Placement
1. General
   a. This section outlines the requirements for the placement of Class P1, P2, and HES concrete. Refer to other specifications for the placement requirement of other concrete items.
   b. Contractor to notify the City at least two working days in advance of installation of concrete pavement.
   c. Take care when placing concrete to keep all foreign material out.
   d. Remove any foreign material from concrete pavement without damaging the concrete.
   e. Concrete may be poured by hand in situations where a slip-form paver cannot be used due to space restrictions.
   f. Receive approval from the City prior to hand pouring concrete. Hand pouring should be minimized.
   g. Do not allow pavement edge to deviate from the established paving line by more than 1/2 inches at any point.
   h. Place the concrete as near as possible to its final location and minimize segregation and re-handling.
   i. Distribute concrete using shovels where hand spreading is necessary. Do not use rakes or vibrators to distribute concrete.
2. Removing Forms
   a. Cleaning
      1) Clean forms thoroughly after each use.
   b. Removal
      1) Forms to remain in place until the concrete is set and the removal will not cause damage to the concrete. Leave the forms in place for 12 hours after concrete has been poured unless approved by the City.
      2) If forms are removed before 72 hours after concrete placement, promptly apply membrane curing compound to the edge of the concrete pavement.
      3) Avoid damage to the edge of the pavement when removing forms.
      4) Repair damage resulting from form removal and honeycombed areas with a mortar mix within 24 hours after form removal unless otherwise approved.

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5) Remove and replace any damaged concrete that was not repaired within 24 hours at no cost to the City.

3. Reinforcing Steel and Joint Assembles
   a. General
      1) Place reinforcing steel, dowels, and tie bars in position specified in the Drawings.
      2) Provide reinforcing in accordance with the requirements of this Section.
      3) Secure reinforcing bars at alternate intersections with wire ties or locking support chairs.
      4) Tie all splices with wire.
      5) Install all bars in their required position as specified in the Drawings.
   b. Splicing
      1) Provide standard reinforcement splices by lapping and tying ends.
      2) In accordance with ACI 318 for minimum lap of spliced bars where not specified in the Drawings.
   c. Installing and Supporting Reinforcing Steel
      1) Layout reinforcing steel in accordance with Drawings. Support reinforcing steel using approved chairs or baskets.
      2) Do not allow construction personnel to walk on the reinforcement bars. Replace any chair that is broken prior to concrete placement.
      3) Steel pins may also be used to hold the reinforcement in place.
      4) If reinforcing steel is found to be at incorrect depth:
         a) Prior to concrete being poured, Contractor to adjust steel to correct depth as specified in the Drawings.
         b) If concrete has been poured, Contractor to remove and replace at no cost to the City.

4. Joints
   a. General
      1) Place joints shown on the Drawings. If jointing layout is not provided on the Drawings, submit a jointing layout for review and approval to the City.
      2) Maintain a right angle with the surface of the pavement for all joints.
      3) Maintain an angle of greater than 75 degrees between all joints if 90 degrees is not achievable unless otherwise shown on the Drawings.
      4) If uncontrolled cracking occurs during sawing, the City may require the panel with the crack to be removed and replaced at no cost to the City.
      5) Use dowel baskets to support dowels and tie bars in the location shown on the Drawings. Do not manually or mechanically insert tie bars or dowels into wet or hardened concrete unless otherwise approved by the City.
      6) Secure the dowel baskets into the subgrade or hot-mix asphalt base so that the baskets to not tip or move during concrete placement. Set up rebar and support baskets at least 12 hours prior to concrete placement for inspection.
      7) Use the appropriate bar based on the Drawings and the requirements under Materials.
      8) Clean and seal all joints before opening the pavement to traffic.
      9) Joint Dimensions and Spacing
         a) Match width and depth of the joint shown on the Drawings.
         b) Dimensions of the sealant reservoir to match manufacturer's recommendations.

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c) Ensure the joint depth after curing is 1/8 inch to 1/4 inch below the pavement surface at the center of the joint. If joint depth exceeds 1/4 inch, The City may request corrective action to be taken that may include remove and replace at no cost to the City.
d) Maintain a maximum 15 foot longitudinal joint spacing.
e) Ensure longitudinal joints follow the proposed lane lines where possible.

b. Contraction Joints
1) Transverse Contraction Joints
a) Only used in plain-jointed concrete pavement.
b) Maintain joint spacing as shown on the Drawings.
c) Do not install transverse contraction joints in continuously reinforced concrete pavement.
d) Use dowel bars that are coated with a thin film of grease or other approved de-bonding material to prevent concrete from bonding to the bar. See Materials.
e) Use the appropriate bar size, length, and spacing shown on the Drawings.
f) Maintain a sawcut depth of 1/3 of the slab thickness.
2) Longitudinal Contraction Joints
a) Used in plain-jointed and continuously reinforced concrete.
b) Maintain joint spacing as specified in the Drawings.
c) Use single piece tie bars. See Materials.
d) Use the appropriate bar size, length, and spacing specified in the Drawings.
e) Maintain a sawcut depth of 1/3 of the slab thickness.

c. Construction Joints
1) General
a) Use reinforcing support chairs to hold reinforcing bars that extend through the bulkhead in place.
b) Splicing is not allowed within 10 feet of a transverse construction joint.
c) Use the appropriate bar size, length, and spacing specified in the Drawings.
2) Transverse Construction Joints
a) A transverse construction joint shall be formed at the close of each day's work or when the placing of concrete has been stopped for 30-minutes or longer.
b) Provide a bulkhead (header) of sufficient cross-sectional area to prevent deflection and accurately notched to allow longitudinal rebar to continue through the bulkhead.
c) Provide bulkheads cut true to the section of the finished pavement and cleaned.
d) Plain-Jointed Concrete
(1) Select the construction joint location to be either at planned transverse contraction joint or halfway between two planned transverse contraction joints.
e) Continuously Reinforced Concrete
(1) Additional steel may be required. See Drawings for additional information.

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(2) Ensure longitudinal steel is supported and protected to prevent damage, vibration, and impact.

3) Longitudinal Construction Joints

a) Use multiple piece tie bars where possible. See Materials.

b) Bent tie bars are not permitted.

c) Drill and epoxy single piece tie bars only for widening or maintenance projects where new concrete is being poured adjacent to existing concrete.

d) Inserting Tie Bars

(1) When approved, insert tie bars per this Section.

(2) Fresh Concrete Installation:

(a) Mechanically insert the tie bars using the paving machine when possible.

(b) If the tie bar is inserted manually, check the insertion depth and location to ensure proper placement and evaluate if there has been any surface drop down.

(c) If any surface drop down has occurred, repair concrete to the City's satisfaction.

(d) Take care to avoid moving the reinforcing mat or any other reinforcing in the concrete when inserting the tie bar.

(3) Hardened Concrete Installation:

(a) Mark tie bar location and drill holes into the hardened concrete at least 10-inches deep with a drill bit that is 1/8-inch greater in diameter than the tie bar diameter.

(b) Clean the hole with a wire brush and compressed air to remove all the dust and moisture.

(c) Follow the epoxy manufacturer's instruction to apply the epoxy. Fill the entire hole with Type 3, Class C epoxy before inserting the tie bars.

(d) When installing tie bars into hardened concrete, perform a pullout test.

(4) Pullout Test:

(a) Perform pullout tests on tie bars designated by the City.

(b) Install the tie bar in accordance with this Section and the Drawings.

(c) Perform a pullout test in accordance with ASTM E488 within the epoxy manufacturer's recommended curing time.

(d) Verify the tie bar meets a pullout strength of at least 3/4 of the yield strength of the tie bar.

(5) Corrective Measures

(a) Perform corrective measures to provide adequate pullout resistance if any of the tests do not meet the required minimum pullout strength.

(b) Repair any damage caused by testing at no cost to the City.

(c) Acceptable corrective measures include, but are not limited to, installation of additional or longer tie bars.

d. Expansion Joints

1) Install expansion joints perpendicularly to the surface at the locations shown on the Drawings, or as approved by the City.

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2) Use dowels for expansion joints with a thin film of grease or other approved de-bonding material with dowel caps on the lubricated end of each dowel bar.
3) Use the appropriate bar size, length, and spacing shown on the Drawings.
4) When the proposed pavement is adjacent to or around existing structures, install expansion joints along the entire length of an existing structure.
5) Joint Filler
a) Provide joint fillers that conform to the requirements under Materials and Source Quality Control.
b) Provide timber boards that are accurately notched to allow rebar to continue through the expansion joint as needed.
c) Extend joint filler past or slightly below the bottom of concrete slab.
d) Use timber boards that span the length of the pavement width. Take care to ensure the timber board does not break, crack, or shift during concrete placement.
e) If the timber boards cracks, breaks, or shifts, remove and replace the adjacent pavement panels and reconstruct the pavement with a compliant timber board at no cost to the City.

e. Curb Joints
1) Provide joints in the curb of the same type and location as the adjacent pavement.
2) Extend expansion joints through the curb.
3) Extend sawed joints through the curb.
4) Construct curb joints at all transverse pavement joints.
5) For non-monolithic curbs, drill and epoxy tie bars as specified in the Drawings.

f. Sawing Joints
1) Joints to be sawed into concrete as soon as can be accomplished without damage to the pavement within 24 hours of concrete pavement placement as shown on Drawings.
2) Saw joints to the depth and spacing shown on the Drawings.
3) Use a chalk line, stringline, saw template, or other approved method to provide a true joint alignment.

g. Joint Sealing
1) See Section 32 13 73.

5. Concrete Placement
a. General
1) Use a slip-form paving machine. Hand paving is only permitted in areas such as intersections or other areas where use of paving machine is not practical.
2) If hand-pouring does not produce the required consolidation and finishing results, take immediate action. The City may require corrective action that may include removal and replacement of concrete at no cost to the City.
a) Do not use rakes or vibrators to move concrete. Only use shovels or the augers on the spreader and paver to move the concrete.
3) Do not allow the pavement edge to deviate from the established paving line by more than 1/2 inch at any point.
a) Consistency
4) Provide concrete with following consistency qualities:

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a) Mortar clings to coarse aggregate
b) Aggregate does not segregate in concrete when transported to the place of deposit
c) Concrete should flatten out at the center of the pile with edges standing and not flowing when dropped directly from the discharge chute of the mixer.
d) Concrete and mortar shows no free water when removed from the mixer
e) Concrete to slide and not flow into place when transported in metal chutes at an angle of 30 degrees with the horizontal
f) Surface of the finished concrete to be free from a surface film or laitance

b. Honeycombing
1) Prevent honeycombing by taking special care placing and spading the concrete against forms and joints.
2) The City may reject concrete with excessive voids and honeycombing on the edge of the pavement. The City may request corrective action to be taken that may include removal and replacement at no cost to the City

6. Consolidation
a. Consolidate all concrete by approved mechanical vibrators in accordance with the requirements of this Section.
b. Ensure the vibrators don't dislodge or disturb the reinforcement.
c. Use hand-operated vibrators to consolidate concrete along forms, at all joints, and in areas not accessible to the machine-mounted vibrators.
d. Do not operate machine-mounted vibrators while the paving equipment is stationary.

7. Curb
a. Construct concrete curb in accordance with Section 32 16 13.

8. Spreading and Finishing
a. General
1) Finish concrete using approved finishing equipment per this specification.
2) If excessive surface slurry or bleeding occurs:
a) Do not finish concrete
b) Contact concrete supplier and review on-site conditions to verify too much water is not being added to the concrete mix by the Contractor or at the plant.
c) A fine mist of water may be used during dry conditions when approved by the City and only when under City supervision.
3) Use minimal amount of water to maintain a moist surface.
4) Reduce misting if float or straightedge finishing operations result in an excess amount of surface slurry.
5) Do not apply water from a nozzle or a garden-type hose.
6) Do not finish the concrete if there is free standing water on the surface of the concrete. Wait until the water evaporates before finishing.
7) Hand finishing permitted only in intersections and areas inaccessible to a finishing machine.

b. Quality Checks

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1) Perform sufficient checks with a long-handled 10-foot or 15-foot straightedge on fresh concrete to ensure the final surface is within the tolerances specified in Ride Quality.
   a) Verify there is not more than 1/16-inch variation between the straightedge and the surface of the pavement.
   b) Rework and refinish any surface not within the tolerance limits.
2) Edging
   a) Tool all edges of slabs and all joints with an edger of the radius specified in the Drawings.
   b) All concrete work to be left smooth and true to lines.

9. Texturing
   a. Complete final texturing using approved texturing equipment in accordance with this Section.

10. Curing
   a. Surface Moisture
      1) Prevent surface drying of pavement before application of the curing compound by means that may include water fogging/misting, wind screens, and evaporation retardants. Obtain approval from the City before using any of these methods.
      2) If an evaporation retardant is approved, reapply as needed to maintain the concrete surface in a moist condition until the curing compound is applied.
      3) Do not use evaporation retardant as a finishing aid.
      4) If there is pavement failure due to poor surface moisture, City may require corrective action that could include removal and replacement at no cost to the City.
   b. A curing day is defined as a 24-hour period when either the temperature taken in the shade away from artificial heat is above 50 degrees Fahrenheit for at least 19 hours or the surface temperature of the concrete is maintained above 40 degrees Fahrenheit for 24 hours.
   c. Curing begins when the concrete curing compound or system has been applied.
   d. Maintain and promptly repair damage to curing materials on exposed surfaces of concrete pavement continuously for at least 3 curing days.
   e. Ensure curing compound does not disintegrate, peek, or crack.
   f. The City may reject the curing compound based on visual and odor inspection.
   g. Application
      1) Apply the curing compound in accordance with DMS-4650.
      2) Manage finishing and texturing operations to ensure placement of curing compound on a moist concrete surface relatively free of water.
      3) Maintain curing compounds in a uniformly agitated condition free of settlement before and during application.
      4) Do not thin or dilute the curing compound.
      5) Apply two coats of the curing compound.
      6) Apply to damp concrete as a fine mist through atomizing nozzles, at a rate of no more than 180 square feet per gallon, that covers entire surfaces thoroughly and completely with a uniform film.
      7) Coat sides of concrete slab after side forms are removed and earth is banked against them.
   h. Alternative Curing Methods

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1) If an alternative curing method is preferred, submit a request to City with all product data needed at least 72 hours prior to a concrete pour.
2) If the alternative method for curing does not produce desire results, cease concrete paving activities and implement another method of curing.

11. Protection of Pavement and Opening to Traffic
a. Protection of Pavement
1) Erect and maintain barricades and other standard and approved devices, excluding all vehicles and equipment from the newly placed pavement for the periods specified.
2) Maintain an adequate supply of sheeting or other material to cover and protect fresh concrete surface from weather damage. Apply as needed to protect the pavement surface from weather.
b. Opening to Traffic
1) All traffic to be excluded from new concrete pavement for a minimum of 14 days.
2) Early Opening to Traffic
a) If traffic needs to be open earlier than 14 days post pavement activities, use HES concrete.
b) Perform concrete cylinder breaks at 24 hours. If the compressive strength is 3,200 psi or higher, pavement may be opened to traffic after 72 hours.
3) Emergency Opening to Traffic
a) Open the pavement to traffic under emergency conditions when directed in writing by the City and the pavement is at least 72 hours old.
b) Remove all obstructing materials, place stable material against the pavement edges, and perform other work involved in providing for the safety of traffic as required for emergency opening.
c. Clean and fill all joints prior to opening pavement to traffic.

12. Pavement Leaveouts
a. Provide pavement leaveouts as necessary for local traffic at locations specified in the Drawings or as directed by the City.
b. Provide a suitable crossover connection for traffic movements based on a location that is determined in the field by the City.

C. Batching Equipment
1. Batching equipment shall be in accordance with the requirements of Section 41 14 00.

3.5. REPAIR

A. Repair concrete pavement in accordance with 32 01 29.

B. Repair the following items to remain at no cost to the City if any damage is caused due to concrete paving activities:
1. Adjacent concrete or asphalt pavement to remain
2. Adjacent sidewalk to remain
3. Adjacent curb or curb and gutter to remain
4. Subgrade or base material

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5. Utility pipe
6. Irrigation systems including but not limited to sprinkler heads, conduit, and pipe.
7. Landscape beds or planters
8. Sod
9. Decorative hardscape or landscape features
10. Retaining walls

3.6. RE-INSTALLATION [NOT USED]

3.7. SITE QUALITY CONTROL

A. Verification Testing

1. General:
   a. At the request of the City, the Contractor is to perform additional testing to verify compliance, or the City may perform verification testing utilizing a third-party testing laboratory.
   b. The City may request verification testing at any time if production is suspected to be non-conforming.
   c. Verification testing will be performed in accordance with ASTM C42.
   d. Verification testing will be performed by the Contractor at no cost to the City.
2. Concrete Mix Design and Verification
   a. Perform required tests specified under Section 03 00 00 and provide testing and evaluation reports.
   b. Any concrete installed using a non-conforming mix design will be subject to removal and replacement at no cost to the City.
3. Concrete Production Acceptance
   a. During production and placement of concrete, perform testing to verify the concrete is in conformance with the requirements in Section 03 00 00 for the admixtures, mix design, slump, and compressive strength.
   b. Aggregate Moisture Testing
      1) In accordance with Section 32 05 16.
4. Concrete Placement Acceptance
   a. Perform required tests specified under Section 03 00 00 and provide testing and evaluation reports.
   b. If concrete is suspected of having foreign material, City may reject at any time and the concrete may be removed and replaced at no cost to the City.
   c. Acceptance will be based on attaining the strength and the fresh concrete tests in accordance with Section 03 00 00.

B. Class P1, P2, and HES Pavement Thickness Test

1. Sampling
   a. Perform strength testing for all projects containing more than 60 cubic yards of concrete.
   b. Obtain pavement cores in accordance with Tex-424-A. Check the pavement thickness in accordance with Tex-423-A.
   c. Collect pavement cores every 500 feet at the center of each concrete paving run. If lanes are paved separately, collect a pavement core at the center of each set of paved lanes.

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d. For hand poured concrete collect pavement cores every 250 feet.
e. Fill core holes using an approved concrete mixture and method.

2. Acceptance
   a. The Contractor will not be paid over the contract unit price for any pavement that is thicker than what is specified in the Drawings.
   b. For pavement thickness deficiencies greater than 0.2 inches but less than 0.5-inches less than the thickness designated on the Drawings:
      1) Obtain additional cores every 150 feet at locations designated by the City.
      2) Additional cores may be requested by the City if the pavement is suspected to be deficient.
      3) Obtain cores until the variation between the thickness designated on the Drawings is less than 0.2-inches.
      4) For deficit concrete limit:
         a) Remove limits of deficient concrete and replace at no cost to the City, or
         b) Concrete to remain and City will pay the Contractor 50 percent of the unit price of concrete specified in the bid documents.
   c. For pavement thickness deficiencies greater than 0.5 inches less than the thickness designated on the Drawings:
      1) Remove and replace deficient concrete at no cost to the City.

C. Class P1, P2, and HES Concrete Ride Quality

1. General
   a. Provide a pavement to have a finished grade smooth and true to the established line, grade, and cross-section.
   b. Ride quality will be measured parallel (longitudinal) and perpendicular (transverse) to the centerline of the roadway for pavement surfaces.

2. Profile Measurements
   a. Use a 10-foot straightedge to perform ride quality tests or a high-speed or lightweight inertial profiler certified at the Texas A&M Transportation Institute.
      1) If using an inertial profiler, provide equipment certification documentation, display a current decal on the equipment indicating the certification expiration date, and use a certified profiler operator from TxDOT's Material Producer List.
      2) Use an inertial profiler when requested by the City.
      3) Provide documentation of the profiles when requested by the City.
   b. Perform tests daily throughout the duration of the project.
   c. Perform tests on the finished surface of the completed project or at the completion of a major stage of construction as approved.
   d. Perform testing during off-peak traffic flow. Operate the inertial profiler in a manner that does not disrupt traffic flow as directed.
   e. When measuring the ride quality on a surface open to traffic, use a moving traffic control plan in accordance with Part 6 of the TMUTCD and the Drawings.

3. Acceptance Plan
   a. General
      1) Evaluate longitudinal and transverse profiles to verify not more than 1/8-inch variation between any 2 contacts.

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2) Perform corrective action on surface areas that have more than 1/8-inch variation between any 2 contacts.

b. Localized Roughness

1) Determine areas of localized roughness using the individual profile from each wheel path.

2) Use a 10-foot straightedge to locate areas that have more than 1/8-inch variation between any 2 contacts on the straightedge.

3) The City may waive localized roughness requirements for deficiencies resulting from manholes or other similar appurtenances near the wheel paths.

c. Corrective Action

1) Use diamond grinding to correct variations in the pavement surface or localized roughness.

2) Reprofile the corrected area and provide results indicating the corrective action was successful.

3) After making corrections, reprofile the pavement section to verify corrections have produced the required improvements.

4) If corrective action does not produce the required improvement, the City may require:

a) Continued corrective action, or

b) Removal and replacement of area at no cost to the City. The City may negotiate a reduced payment amount for the defective area to remain in place.

D. Non-Conforming Work

1. General

a. The City may at any time reject a material if it is found to be non-conforming to this specification.

b. The City may require the Contractor at any time to remove and replace installed Concrete Pavement if any material it was made with is found to be non-conforming. This would be at no cost to the City.

c. Any rejection of materials or source locations will be at no cost to the City.

2. Aggregates

a. Aggregates that fail to meet the requirements of Section 32 05 16 will be rejected by the City.

3. Concrete Mix Design and Production Materials

a. The City may reject the mix design if it does not conform to the requirements of this specification and section 03 00 00.

b. Any concrete installed using a non-conforming mix design will be subject to removal and replacement at no cost to the City.

c. The City may perform verification testing on all materials verify the conformance of the mixture.

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3.8. SYSTEM STARTUP [NOT USED]

3.9. ADJUSTING [NOT USED]

3.10. CLEANING [NOT USED]

3.11. CLOSEOUT ACTIVITIES [NOT USED]

3.12. PROTECTION [NOT USED]

3.13. MAINTENANCE [NOT USED]

3.14. ATTACHMENTS [NOT USED]

END OF SECTION

Revision Log		
DATE	NAME	SUMMARY OF CHANGE
6/14/2024		Removed maximum temperature limit for placement of concrete; 1.11.A
6/14/2014		Removed longitudinal tining requirement; 3.4.A.4

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SECTION 32 13 73
CONCRETE PAVING JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Sealants for Concrete Joints.

B. Deviations from this City of Denton Standard Specification:

1. None.

C. Related Specification Sections include but are not limited to:

1. Division 0 - Bidding Requirements, Contract Forms, and Conditions of the Contract.
2. Division 1 - General Requirements.

1.2 PRICE AND PAYMENT PROCEDURES

A. Joint sealant materials, equipment, tools, and incidentals will not be measured or paid for directly. All items included with the testing and furnishing of joint sealants are subsidiary to other pertinent items.

1.3 REFERENCES

A. Reference Standards

1. Reference standards cited in this Section refer to the current reference standard published at the time of the latest revision date logged at the end of this Section unless a date is specifically cited.
2. American Society for Testing and Materials (ASTM):
   a. ASTM D5249 – Standard Specification for Backer Material for Use with Cold and Hot Applied Joint Sealants in Portland-Cement Concrete and Asphalt Joints.
3. TxDOT Standards:
   a. DMS-6310 – Joint Sealants and Seals.

1.4 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00.

B. All submittals shall be approved by the City prior to delivery.

1.5 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS

A. Product Data

1. Provide electronic product data from each manufacturer that is supplying concrete joint sealants to be used on the project.
2. Product data sheets will include:
   a. Manufacturer name

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b. Date
c. Material description
d. Point of delivery
e. Produce data and test results in accordance with this Section
f. Material Safety Data Sheets, if applicable, required for PCE and all additives
g. Manufacturer Recommended Storing Data, if applicable
h. Application Recommendations, if applicable
i. Liquid Antistripping Agent Specific Data:
1) Specific gravity of the agent at the manufacturer's recommended addition temperature
2) Manufacturer's recommended dosage range
3) Manufacturer's Recommended Storage and Handling instructions

1.6 CLOSEOUT SUBMITTALS [NOT USED]

1.7 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]

1.8 QUALITY ASSURANCE [NOT USED]

1.9 DELIVERY, STORAGE, AND HANDLING

A. Storage and Handling Requirements
1. Secure and maintain a location to store the material in accordance with Section 01 66 00.

B. Keep the material stored in a clean condition at all times to prevent contamination with foreign matter.

C. Follow any manufacturer recommendations for delivery, storage, and handling.

1.10 FIELD CONDITIONS

A. Ambient Conditions
1. In accordance with manufacturer's recommendations.

1.11 WARRANTY [NOT USED]

PART 2 - PRODUCTS

2.1 CITY-FURNISHED PRODUCTS [NOT USED]

2.2 MATERIALS

A. Joint Sealant
1. Provide joint sealants in accordance with DMS-6310 types 4, 5, 7, or 8 unless otherwise specified in the Drawings or as directed by the City.

B. Backer Rod
1. Provide heat resistant backer rods conforming to ASTM D5249. The preferred product is CERA-ROD by W.R. Meadows or approved equal.

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2. The Contractor may request to use an alternative backer rod product in writing. If requesting an alternative material, the alternative backer rod must comply with the following:
   a. The backer rod must not react with or bond to the sealant and must meet the requirements of the sealant manufacturer.
   b. Provide a backer rod with a diameter of at least 25 percent larger than the joint reservoir width.
   c. Backer rod materials must include closed-cell resilient foam; sponge rubber stock of vinyl, butyl, or neoprene; and polyethylene or polyurethane. Backer rods must also be flexible, lightweight, non-staining, heat-resistant, chemical-resistant, ultraviolet-stable, non-absorbent, low density, and compressible foam.

2.3 ACCESSORIES [NOT USED]

2.4 SOURCE QUALITY CONTROL [NOT USED]

PART 3 - EXECUTION

3.1 EQUIPMENT

A. Condition of Equipment
   1. Provide equipment in good repair and operating condition.
   2. The condition is subject to the approval of the City.
   3. If the equipment is found to be insufficient, the Contractor is responsible for replacing the non-conforming equipment with conforming equipment at no cost to the City.
   4. Any sealant installed using non-conforming equipment is subject to removal and replacement at no cost to the City.

3.2 EXAMINATION [NOT USED]

3.3 PREPARATION

A. Make a groove along the cracks to be sealed and rout the groove approximately 1/2-inch-deep and 5/8-inch-wide, unless otherwise specified in the Drawings or directed by the City.

B. Remove all foreign material from the joint or groove reservoir.

C. Clean the joint by sandblasting or other approved methods. If directed, saw joint sides to remove embedded foreign material in the concrete not removed by sandblasting.

D. Do not place sealant in a wet or damp joint or groove. Use approved drying method if joints or grooves are sealed within 24 hours of rain.

E. Apply primer when required by the sealant manufacturer. Blow out joint or groove with high pressure air or other approved methods before placing sealant.

3.4 INSTALLATION

A. After the joint is prepped, install sealant material. See Table 1 for different types of joints and sealants to be used.

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B. Install joint sealant per manufacturer's recommendations. If backer rods are required, install backer rods and sealant in accordance with the manufacturer's recommendations and this Section.

C. Backer Rods:

1. Install backer rod with a single-wheeled or three-wheeled roller, depending on application.
2. Avoid stretching or puncturing the material.
3. Hold the backer rod in compression.
4. Provide a backer rod with a diameter 1/8 inch larger than the width of the joint for joint widths up to 3/4 inch. For joints 3/4 inch and larger, add 1/4 inch to diameter rod selection.
5. After backer rods are installed, apply sealants as necessary.

D. Remove and replace sealant when placed flush with or above the pavement surface.

Table 1
Types of Joints Requirements

Joint Type	Requirement
Transverse Contraction Joints	Backer Rods and Sealant
Longitudinal Contraction Joint	Sealant
Longitudinal Construction Joints	Sealant
Expansion Joints	Backer Rods and Sealant

E. Disposal of Materials:

1. Dispose of any excess material produced from cleaning of cracks.

3.5 REPAIR [NOT USED]

3.6 RE-INSTALLATION [NOT USED]

3.7 FIELD QUALITY CONTROL [NOT USED]

3.8 SYSTEM STARTUP [NOT USED]

3.9 ADJUSTING [NOT USED]

3.10 CLEANING [NOT USED]

3.11 CLOSEOUT ACTIVITIES [NOT USED]

3.12 PROTECTION [NOT USED]

3.13 MAINTENANCE [NOT USED]

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3.14 ATTACHMENTS [NOT USED]

END OF SECTION

Revision Log		
DATE	NAME	SUMMARY OF CHANGE

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SECTION 33 14 11
POLYVINYL CHLORIDE (PVC) PRESSURE PIPE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Polyvinyl Chloride (PVC) Pressure Pipe 4-inch through 12-inch for potable water and reuse applications
2. Polyvinyl Chloride (PVC) Pressure Pipe 6-inch through 24-inch for pressure rated gravity sanitary sewer applications.

B. Deviations from this City of Denton Standard Specification:

1. None.

C. Related Specification Sections include but are not limited to:

1. Division 0 - Bidding Requirements, Contract Forms, and Conditions of the Contract
2. Division 1 - General Requirements
3. Section 33 01 10 – Cleaning and Acceptance Testing of Water and Sewer Force Mains
4. Section 33 01 30 – Closed Circuit Television (CCTV) Inspection
5. Section 33 01 31 – Sewer and Manhole Testing
6. Section 33 01 32 – Cleaning of Sewer Mains
7. Section 33 05 05 – Utility Trench Excavation, Embedment, and Backfill
8. Section 33 05 97 – Utility Markers/Locators
9. Section 33 14 10 – Ductile Iron Pipe and Fittings

1.2 PRICE AND PAYMENT PROCEDURES

A. Measurement and Payment

1. PVC Water Pipe
   a. Measurement
      1) Measured horizontally along the ground surface from center line to center line of fitting, manhole, or appurtenance of PVC Pressure Pipe installed.
   b. Payment
      1) The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid per linear foot for "PVC Water Pipe" installed for:
         a) Various sizes.
         b) Various types of backfill.
   c. The price bid shall include:
      1) Furnishing and installing PVC Pressure Pipe as specified by the Drawings
      2) Furnishing and installing Ductile Iron Fittings in accordance with Section 33 14 10
      3) Pavement removal

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4) Excavation
5) Hauling
6) Disposal of excess material
7) Furnishing, placement and compaction of embedment
8) Furnishing, placement and compaction of backfill
9) Trench Dams
10) Thrust restraint
11) Gaskets
12) Clean-up
13) Cleaning
14) Disinfection
15) Testing

2. PVC Gravity Sewer Pressure Pipe
   a. Measurement
      1) Measured horizontally along the ground surface from center line to center line of fitting, manhole, or appurtenance of PVC Pressure Pipe installed.
   b. The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid per linear foot for "PVC Gravity Sewer Pressure Pipe" installed for:
      1) Various sizes.
      2) Various types of backfill.
   c. The price bid shall include:
      1) Furnishing and installing PVC Pressure Pipe as specified by the Drawings
      2) Furnishing and installing couplings
      3) Utility Markers/Locators
      4) Pavement removal
      5) Excavation
      6) Hauling
      7) Disposal of excess material
      8) Furnishing, placement and compaction of embedment
      9) Furnishing, placement and compaction of backfill
      10) Trench Dams
      11) Gaskets
      12) Clean-up
      13) Cleaning
      14) Testing

1.3 REFERENCES

A. Abbreviations and Acronyms
   1. PVC – Polyvinyl Chloride

B. Reference Standards
   1. Reference standards cited in this Section refer to the current reference standard published at the time of the latest revision date logged at the end of this Section unless a date is specifically cited.
   2. American Association of State Highway and Transportation Officials (AASHTO).
   3. ASTM International (ASTM):

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a. D1784, Standard Specification for Rigid Poly(Vinyl-Chloride)(PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds.
b. D3139, Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.

4. American Water Works Association (AWWA):
   a. M23, PVC Pipe – Design and Installation.
5. American Water Works Association/American National Standards Institute (AWWA/ANSI):
   a. C600, Installation of Ductile-Iron Water Mains and their Appurtenances.
   b. C605, Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipes and Fittings for Water.
   c. C900, Polyvinyl Chloride (PVC) Pressure Pipe, and Fabricated Fittings, 4 IN through 60 IN, for Water Transmission and Distribution.
6. NSF International (NSF):
   a. 61, Drinking Water System Components – Health Effects.
   b. 372, Drinking Water System Components – Lead Content.
7. Underwriters Laboratories, Inc. (UL).
   a. 1285, Standard for Pipe and Couplings, Polyvinyl Chloride (PVC), and Oriented Polyvinyl Chloride (PVCO) for Underground Fire Service

1.4 ADMINISTRATIVE REQUIREMENTS [NOT USED]

1.5 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00.

B. All submittals shall be approved by the City prior to delivery.

1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS

A. Product Data
   1. For PVC Pressure Pipe that is used for water distribution or wastewater gravity mains, including:
      a. PVC Pressure Pipe
      b. Manufacturer
      c. Dimension Ratio
      d. Joint Types
   2. Restraint
      a. Retainer glands
      b. Thrust harnesses
      c. Any other means of restraint
   3. Gaskets
   4. Couplings for gravity sewer applications only

B. Certificates
   1. Furnish an affidavit certifying the PVC Pressure Pipe meets the provisions of this Section, all inspections have been made, and all tests have been performed in accordance with AWWA C900.

1.7 CLOSEOUT SUBMITTALS [NOT USED]

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1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]

1.9 QUALITY ASSURANCE

A. Qualifications
1. Manufacturers
a. Finished pipe shall be the product of 1 manufacturer for each size, unless otherwise approved by the City.
1) Change orders, specials, and field changes may be provided by a different manufacturer upon City approval.
b. Pipe manufacturing operations shall be performed under the control of the manufacturer.
c. Furnish all pipe in accordance with AWWA C900.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Acceptance Requirements
1. Pipe manufactured more than 2 years prior to installation date will not be accepted by the City.

B. Storage and Handling Requirements
1. Secure and maintain a location to store the material in accordance with Section 01 66 00.
2. Store and handle in accordance with the guidelines as stated in AWWA M23.
a. When long-term storage (more than 2-months) with exposure to direct sunlight is unavoidable, cover PVC pipe with an opaque material and provide adequate air circulation above and around the pipe as required to prevent excessive heat accumulation.

1.11 FIELD CONDITIONS [NOT USED]

1.12 WARRANTY [NOT USED]

PART 2 - PRODUCTS

2.1 CITY-FURNISHED PRODUCTS [NOT USED]

2.2 MATERIALS

A. Manufacturers
1. Manufacturer List (Potable Water Pipe)
a. Diamond Plastics
b. JM Eagle
c. Northern Pipe Products
d. Westlake Pipe & Fittings
e. Certa-Lok by CertainTeed
f. Vinyltech
2. Manufacturer List (Gravity Sewer Pipe)
a. Diamond Plastics

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b. JM Eagle
c. Westlake Pipe and Fittings
d. Vinyltech

3. Manufacturer List (Couplings)
a. Multifittings Sewer Brute repair coupling
b. HARCO C900 repair coupling
c. Smith-Blair 226 or 228 repair clamp

4. Substitution requests for manufacturers not indicated above shall be processed in accordance with Section 01 25 00.

B. Pipe

1. Manufactured in accordance with AWWA C900.

2. Pipe for potable water shall be in accordance with NSF 61 and 372.

3. Pipe shall be approved by the Underwriter's Laboratories, in accordance with UL 1285.

4. Pipe shall have a lay length of 20 feet except for special fittings or closure pieces necessary to comply with the Drawings.

5. The pipe material shall be PVC, meeting the requirements of ASTM D1784, with a cell classification of 12454.

6. Pipe shall be colored blue for potable water applications. Pipe shall be colored green for sanitary sewer applications. Pipe shall be colored purple for reuse water applications.

7. Outside diameters must be equal to those of cast iron and ductile iron pipes.

8. The following minimum Dimension Ratio's apply:

Application	Diameter (inch)	Min Pressure Class (psi)
Potable Water	4 through 12	DR 14
Pressure Rated Gravity Sewer Main	6 through 24	DR 25

9. Pipe Markings
a. Meet the minimum requirements of AWWA C900. Minimum pipe markings shall be as follows and shall be applied at intervals of not more than 5 feet:
1) Manufacturer's name or trademark and production run record or lot code
2) Nominal pipe size in inches and outer diameter base
3) Dimension Ratio
4) Pressure class
5) Hydrostatic integrity test pressure on all standard length hydrostatic-tested pipe
6) AWWA C900
7) Mark of certifying agency for pipe intended for potable-water service or if not intended for potable water "NOT FOR POTABLE USE"
8) For deflectable joints, the maximum allowable axial joint deflection in degrees

C. Pressure and Deflection Design

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1. Base pipe design on trench conditions and design pressure class specified in the Drawings. Pipe shall be designed in accordance with the methods indicated in AWWA M23 for trench construction, using the following parameters:
   a. Unit Weight of Fill (w) = 130 pcf
   b. Live Load = AASHTO HS 20
   c. Trench Depth = 12 feet minimum or as indicated in Drawings
   d. Maximum E' = 1,000 max
   e. Deflection Lag Factor = 1.0
   f. Working Pressure (P_w) = 150 psi
   g. Surge Allowance (P_s) = 100 psi minimum
   h. Test Pressure =
      1) No less than 1.25 times the stated working pressure (187 psi minimum) of the pipeline measured at the highest elevation along the test section.
      2) No less than 1.5 times the stated working pressure (225 psi minimum) at the lowest elevation of the test section.
   i. Maximum Calculated Deflection = 3 percent
   j. Restrained Joint Safety Factor (SF) = 1.5
   k. Maximum Joint Deflection = 100 percent of the manufacturer's recommendations.
2. Verify trench depths after existing utilities are located.
   a. Accommodate vertical alignment changes required because of existing utility or other conflicts by an appropriate change in pipe design depth.
   b. In no case shall pipe be installed deeper than its design allows.
3. Provisions for Thrust
   a. Mechanically restrain all bends, tees, plugs, or other fittings with retainer glands in accordance with Section 33 14 10.
   b. Restrained joints, where required, shall be used for a sufficient distance from each side of the bend, tee, plug, valve, or other fitting to resist thrust which will be developed at the design pressure of the pipe. For the purpose of thrust the following shall apply:
      1) Calculate valves as dead ends.
      2) Design pressure shall be greater than both the pressure class of the pipe and the internal pressure (P_i).
      3) Restrain joints with the following:
         a) External mechanical joint restraint system in accordance with Section 33 14 10; or
         b) Certa-Lok by CertainTeed restrained joint system.
   c. The Pipe Manufacturer shall verify the length of pipe with restrained joints to resist thrust in accordance with the Drawings and the following:
      1) Calculate the weight of the earth (W_e) as the weight of the projected soil prism above the pipe, for unsaturated soil conditions.
      2) Soil density = 110 pcf (maximum value to be used), for unsaturated soil conditions
      3) In locations where ground water is encountered, reduce the soil density to its buoyant weight for the backfill below the water table.
         a) Reduce the coefficient of friction to 0.25.
4. Joints

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a. Joints shall be gasket, bell and spigot, and push-on type in accordance with ASTM D3139.
b. Since each pipe manufacturer has a different design for push-on joints, gaskets shall be part of a complete pipe section and purchased as such.
c. Lubricant must be non-toxic and NSF approved for potable water applications.

5. Couplings
   a. Approved couplings are only allowed for gravity sewer applications. Potable water couplings are addressed under Section 33 14 10.

6. Detectable Markers
   a. Provide detectable markers in accordance with Section 33 0597.

2.3 ACCESSORIES [NOT USED]

2.4 SOURCE QUALITY CONTROL [NOT USED]

PART 3 - EXECUTION

3.1 INSTALLERS [NOT USED]

3.2 EXAMINATION [NOT USED]

3.3 PREPARATION [NOT USED]

3.4 INSTALLATION

A. General
1. Install pipe, fittings, specials, and appurtenances in accordance with this Section, AWWA C600, AWWA C605, AWWA M23, and the pipe manufacturer's recommendations.
2. Lay pipe to the lines and grades indicated in the Drawings.
3. Excavate and backfill trenches in accordance with Section 33 0505.
4. At the close of each operating day:
   a. Keep the pipe clean and free of debris, dirt, animals, and trash – during and after the laying operation.
   b. Effectively seal the open end of the pipe using a gasketed night cap.
5. Embed pipe in accordance with Section 33 0505.
6. Installation of PVC pipe within casing is only permitted with restrained joints.

B. Pipe Handling
1. Haul and distribute pipe at the project site.
2. Handle piping with care to avoid damage.
   a. Inspect each joint of pipe and reject or repair any damaged pipe prior to lowering into the trench.
   b. Use only nylon ropes, slings, or other lifting devices that will not damage the surface of the pipe for handling the pipe.

C. Pipe Jointing
1. Mechanical Joints
   a. Install mechanical joints in accordance with Section 33 1410.

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2. Push-on Joints
   a. Install push-on joints as defined in AWWA C900.
   b. Wipe gasket seat inside the bell clean of all extraneous matter.
   c. Place the gasket in the bell in the position specified by the manufacturer.
   d. Apply a thin film of non-toxic vegetable soap lubricant to the inside of the gasket and the outside of the spigot prior to entering the spigot into the bell.
   e. Assemble the pipe joint by sliding the lubricated spigot end into the gasketed bell end to the reference mark on the spigot.
   f. When using a field cut plain end piece of pipe, refinish the field cut to conform to AWWA C605.
   g. For gravity sewer applications only, an approved manufacturer's coupling shall be utilized to join two plain-end pipes per the guidelines provided by the coupling manufacturer.
3. Joint Deflection
   a. Deflect the pipe only when necessary to avoid obstructions or to meet the lines and grades shown in the Drawings.
   b. Joint deflection shall not exceed 100 percent of the manufacturer's recommendation.

D. Detectable Metallic Tape Installation
   1. See Section 33 05 97.

3.5 REPAIR [NOT USED]

3.6 RE-INSTALLATION [NOT USED]

3.7 FIELD QUALITY CONTROL

A. Potable Water Mains
   1. Hydrostatic testing of water mains:
      a. Hydrostatically test the mains in accordance with Section 33 01 10.

B. Gravity Sewer Mains
   1. Closed Circuit Television (CCTV) Inspection
      a. Provide a Post-CCTV Inspection in accordance with Section 33 01 30.
   2. Sewer Pipe Testing
      a. Test pipe in accordance with Section 33 01 31.

3.8 SYSTEM STARTUP [NOT USED]

3.9 ADJUSTING [NOT USED]

3.10 CLEANING

A. Potable Water Mains
   1. Cleaning, disinfection, and bacteriological testing of water mains:
      a. Clean, flush, pig, disinfect, and bacteriological test the mains in accordance with Section 33 01 10.

B. Gravity Sewer Mains
   1. Cleaning of Sewer Mains
      a. Clean the mains in accordance with Section 33 01 32.

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3.11 CLOSEOUT ACTIVITIES [NOT USED]

3.12 PROTECTION [NOT USED]

3.13 MAINTENANCE [NOT USED]

3.14 ATTACHMENTS [NOT USED]

END OF SECTION

Revision Log		
DATE	NAME	SUMMARY OF CHANGE

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SECTION 34 41 50
ALUMINUM SIGNS AND SIGN POSTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Aluminum signs installed on mast arms, signal poles, or steel posts.

B. Deviations from this City of Denton Standard Specification:

1. None.

C. Related Specification Sections include but are not limited to:

1. Division 0 - Bidding Requirements, Contract Forms, and Conditions of the Contract.
2. Division 1 - General Requirements.

1.2 PRICE AND PAYMENT PROCEDURES

A. Measurement and Payment

1. Furnishing and Installing Mast Arm or Signal Pole Mounted Aluminum Signs
   a. Measurement
      1) Measured per each sign furnished and installed.
   b. Payment
      1) The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid per each for "Furnish/Install Alum Sign Mast Arm Mount" installed for:
         a) Various types.
   c. The price bid shall include:
      1) Fabricating the aluminum sign
      2) Treatment of sign panels required before application of background materials
      3) Application of the background materials and messages to the sign panels
      4) Furnishing and fabricating frames, wind beams, stiffeners, or required joint backing strips
      5) Furnishing bolts, rivets, screws, fasteners, clamps, brackets, and sign support connections
      6) Assembling and erecting the signs
      7) Preparing and cleaning the signs
2. Installing Mast Arm or Signal/ Street Light Pole Mounted Aluminum Signs
   a. Measurement
      1) Measured per each sign installed.
   b. Payment
      1) The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid per each for "Install Alum Sign Mast Arm Mount" installed.

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c. The price bid shall include:
   1) Installing each aluminum Sign
   2) Furnishing and fabricating frames, wind beams, stiffeners, or required joint backing strips
   3) Furnishing bolts, rivets, screws, fasteners, clamps, brackets, and sign support connections
   4) Assembling and erecting the signs
   5) Preparing and cleaning the signs

3. Furnishing and Installing Ground Mounted Aluminum Sign and Post Assemblies
   a. Measurement
      1) Measured per each sign and post assembly furnished and installed.
   b. Payment
      1) The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid per each for "Furnish/Install Alum Sign Ground Mount" installed for:
         a) Various types.
   c. The price bid shall include:
      1) Fabrication of signs and posts
      2) Treatment of sign panels required before application of background materials
      3) Application of the background materials and messages to the sign panels
      4) Scheduling utility line locates
      5) Furnishing and fabricating frames, wind beams, stiffeners, or required joint backing strips
      6) Furnishing bolts, rivets, screws, fasteners, clamps, brackets, and sign support connections
      7) Assembling and erecting the signs
      8) Preparing and cleaning the signs

4. Installing Ground Mounted Aluminum Sign and Post Assemblies
   a. Measurement
      1) Measured per each sign and post assembly installed.
   b. Payment
      1) The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid per each for "Install Alum Sign Ground Mount" installed.
         a) Various types.
   c. The price bid shall include:
      1) Scheduling utility line locates.
      2) Assembling and erecting the signs and posts.
      3) Preparing and cleaning the signs.

5. Furnishing and Installing Aluminum Signs Mounted on Existing Poles
   a. Measurement
      1) Measured per each sign furnished and installed.
   b. Payment

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1) The work performed, and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid per each for "Furnish/Install Alum Sign Ex. Pole Mount" installed.

c. The price bid shall include:
1) Furnishing and Installing the aluminum sign
2) Furnishing and fabricating frames, wind beams, stiffeners, or required joint backing strips
3) Furnishing bolts, rivets, screws, fasteners, clamps, brackets, and sign support connections
4) Assembling and erecting the signs
5) Preparing and cleaning the signs

6. Installing Aluminum Sign Mounted on Existing Poles
a. Measurement
1) Measured per each sign installed.
b. Payment
1) The work performed, and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid per each for "Install Alum Sign Ex. Pole Mount" installed.
c. The price bid shall include:
1) Furnishing and fabricating frames, wind beams, stiffeners, or required joint backing strips.
2) Furnishing bolts, rivets, screws, fasteners, clamps, brackets, and sign support connections.
3) Assembling and erecting the signs.
4) Preparing and cleaning the signs.

7. Removal of Signs
a. Measurement
1) Measured per each sign panel removed or each sign panel and post removed.
b. Payment
1) The work performed and materials furnished in accordance with this item and measured as provided under "Measurement" will be paid for at the unit price bid per each "Remove Sign" or "Remove Sign and Post" for:
a) Various types.
b) Various configurations.
c. The price bid shall include:
1) Removal of sign panel
2) Removal of sign post, if required
3) Excavation, if required
4) Hauling, if required
5) Disposal of excess materials
6) Furnishing, placement, and compaction of backfill, if required
7) Returning materials to the City as specified in the Drawings
8) Cleaning sign panel if sign is to be reinstalled
9) Clean-up

1.3 REFERENCES

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A. Reference Standards

1. Reference standards cited in this Section refer to the current reference standard published at the time of the latest revision date logged at the end of this Section unless a date is specifically cited.

2. American Standard Testing Materials (ASTM):
   a. A1011 / A1011M-18a, Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
   b. B117-18, Standard Practice for Operating Salt Spray (Fog) Apparatus.
   c. B209-14, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
   d. B209-02a, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
   e. D4956-17, Standard Specification for Retroreflective Sheeting for Traffic Control.
3. American Association of State Highways and Transportation Officials (AASHTO):
   a. M120-08, Standard Specification for Zinc.
4. Texas Manual on Uniform Traffic Control Devices (TMUTCD).
5. Texas Department of Transportation, Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges (TxDOT):
   a. Item 644, Small Roadside Sign Assemblies.
6. United States Military Standard (MIL):
   a. C5541, Chemical Conversion Coatings on Aluminum and Aluminum Alloys.

1.4 ADMINISTRATIVE REQUIREMENTS [NOT USED]

1.5 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 00.

B. All submittals shall be approved by the City prior to delivery and/or fabrication for special signs.

1.6 ACTION SUBMITTALS/INFORMATIONAL SUBMITTALS

A. Shop Drawings

1. Submit sign shop drawings to City for review prior to fabrication.

1.7 CLOSEOUT SUBMITTALS [NOT USED]

1.8 MAINTENANCE MATERIAL SUBMITTALS [NOT USED]

1.9 QUALITY ASSURANCE [NOT USED]

1.10 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Acceptance Requirements

1. Properly protect signs and parts so that no damage or deterioration occurs during the time of shipment until installation.

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B. Storage and Handling Requirements
1. Secure and maintain a location to store the material in accordance with Section 01 66 00.
2. Ship, handle, and store completed sign blanks and completed signs so that corners, edges, and faces are not damaged.
3. Replace unacceptable signs as directed by City.
4. Store all finished signs off the ground and in a vertical position until erected.
5. Store finished signs 60 inches x 60 inches or smaller in a weatherproof building.
a. Larger signs may be stored outside.

1.11 FIELD CONDITIONS [NOT USED]

1.12 WARRANTY [NOT USED]

PART 2 - PRODUCTS

2.1 CITY-FURNISHED PRODUCTS

A. Items eligible for purchase from the City include:
1. Aluminum Signs.

2.2 MATERIALS

A. Manufacturers
1. Sign Sheeting
a. Acrylic Overlay Film
1) 3M Scotchlite ElectroCut Film Series 1170
b. Non-Reflective Vinyl Film
1) 3M Scotchlite ElectroCut Film Series 7725
c. High Intensity Prismatic Retroreflective Sheeting with Adhesive Backing
1) 3M Series 3930
d. Super-High Efficiency Full Cube Retroreflective Sheeting with Pressure Sensitive Adhesive
1) 3M Series 4000
2. Substitution requests for manufacturers or models not indicated above shall be processed in accordance with Section 01 25 00.

B. Sign Blanks
1. New, unweathered, milled, rolled, and finished aluminum alloy meeting requirements for 5052H38 in accordance with ASTM B209-14.
2. Free of buckle, crevice, warp, dent, cockles, burrs, corrosion, dirt, grease, oil, white rust, fingerprints, and/or other irregularities.
3. Degreased and etched according to industry standards with an Alodine finish applied in accordance with MIL-C5541, Class 1A.
4. Uniform thickness throughout.

C. Sign Sheeting
1. Acrylic Overlay Film

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a. Applied to Type I, Type II, Type IV, Type IX, and other retroreflective sheeting for permanent signing.
b. Durable
c. Transparent
d. Acrylic
e. Electronic-cuttable
f. Coated with a transparent, pressure sensitive adhesive
g. Have a removable synthetic liner – paper liner is not acceptable
h. Fill colors may be yellow, green, blue, brown, red, and orange.

2. Non-Reflective Vinyl Film
a. Applied to Type IV, Type XI (DG3) retroreflective sheeting for permanent signing.
b. Durable
c. 2 mil opaque cast vinyl
d. Coated with a transparent, pressure-sensitive adhesive
e. Have a removable synthetic liner – paper liner is not acceptable
f. Film colors may include yellow, green, blue, brown, red, and orange.

3. High Intensity Prismatic Retroreflective Sheeting with Adhesive Backing
a. Combine with other components for permanent signing.
b. Unmetallized microplastic lens retroreflective element material
c. Smooth outer surface with the property of the retroreflector over its entire surface.
1) The adhesive backing shall be pressure-sensitive, require no heat, solvent, or other preparation for the adhesion to smooth, clean surfaces.
d. Film colors may include white, yellow, green, red, blue, and brown.

4. Super-High Efficiency Full Cube Retroreflective Sheeting with Pressure Sensitive Adhesive
a. Combine with other components for permanent signing.
b. Have the highest retroreflectivity characteristics at medium and short road distances.
c. Microprismatic retroreflective element material
d. Smooth outer surface with the property of retroreflector over its entire surface.
1) The adhesive backing shall be pressure-sensitive, require no heat, solvent, or other preparation for adhesion to smooth, clean surfaces.
e. Film colors may include white, yellow, green, red, blue, brown, fluorescent yellow, fluorescent yellow green, and fluorescent orange.

D. Telescopic Steel Sign Posts and Anchors
1. Provide posts and anchors in accordance with ASTM A1011 /A1011M-18a.
a. Minimum 60,000 psi yield strength.
b. Manufactured from raw steel.
c. Formed and welded on the corner prior to receiving a triple coat protection of inline hot-dipped, galvanized zinc in accordance with AASHTO M-120-08 (0.8 ounces per square foot).
d. Provide chromate conversion coating and a cross-linked polyurethane acrylic exterior coating.
e. Install double coat of zinc based organic coating on interior of posts.
1) Test coating in accordance with ASTM B-117-18.

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E. Hardware
1. Provide galvanized steel, stainless steel, or dichromate-sealed aluminum for bolts, nuts, washers, lock washers, screws, and other sign assembly hardware.
2. Use plastic or nylon washers to avoid tearing the reflective sheeting.

2.3 ACCESSORIES [NOT USED]

2.4 SOURCE QUALITY CONTROL [NOT USED]

PART 3 - EXECUTION

3.1 INSTALLERS [NOT USED]

3.2 EXAMINATION [NOT USED]

3.3 PREPARATION [NOT USED]

3.4 FABRICATION

A. Sign Blanks
1. Provide sign blanks to the sizes and shapes specified in the Drawings, free of buckles, warps, burrs, dents, cockles, or other defects.
2. Do not splice individual extruded aluminum panels.
3. Complete the fabrication of sign blanks, including the cutting and drilling or punching of holes, before cleaning and degreasing.
4. After cleaning and degreasing, ensure the substrate does not come into contact with grease, oils, or other contaminants before the application of the reflective sheeting.

B. Sign Sheeting
1. Use reflective sheeting from the same manufacturer for the entire face of a sign.
2. Apply sheeting to sign blanks in accordance with the recommended procedures of the sheeting manufacturer.
3. Clean and prepare the outside surface of extruded aluminum flanges in the same manner as the sign panel face.
4. Minimize the number of splices in the sheeting.
5. Overlap the lap-splices by at least 1/4 inch.
6. Provide a 1-foot minimum dimension for any piece of sheeting.
7. Do not splice sheeting for signs fabricated with transparent screen inks or colored transparent films.

C. Sign messages
1. Fabricate sign messages to the sizes, types, and colors specified in the Drawings.
2. Use sign message material from the same manufacturer for the entire message of a sign.
3. Ensure the screened messages have clean, sharp edges and exhibit uniform color and reflectivity.
4. Prevent runs, sags, and voids.

D. Telescopic steel sign posts
1. Permissible variation in straightness is 1/16 inch in 3 feet.

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2. Allowable tolerances are based on outside dimensions in accordance with the table below.
   a. Measurements for outside dimensions shall be made at least 2 inches from end of tube.

Nominal Outside Dimensions (inches)	Outside Tolerance at all Side Corners (inches)
1-1/2 x 1-1/2	±0.006
1-3/4 x 1-3/4	±0.008
2 x 2	±0.008
2-1/4 x 2-1/4	±0.010
2-1/2 x 2-1/2	±0.010

3. Permissible variation in wall thickness is plus 0.011 inches, minus 0.008 inches.
4. Measured in the center of the flat side tolerance is ± 0.01 inch applied to the specific size determined at the corner.
5. Allowable tolerance for squareness of sides and permissible twist are based on outside dimensions in accordance with the table below.

Nominal Outside Dimensions (inches)	Squareness Tolerance (inches)	Twist Permissible in 3 inches Lengths (inches)
1-1/2 x 1-1/2	±0.009	0.050
1-3/4 x 1-3/4	±0.010	0.062
2 x 2	±0.012	0.062
2-1/4 x 2-1/4	±0.014	0.062
2-1/2 x 2-1/2	±0.015	0.075

6. All top posts must be capable of fracturing at the point of connection with a single anchor when impacted. Posts must fracture in a manner to allow the piece inside of the anchor to be removed and a new top post be installed.
7. The shape of all posts and anchors shall be square and straight with smooth tubing welded in one corner with a tolerance that permits telescoping of the next larger or small size, in 1/4-inch increments.
8. All anchors shall be 12 gauge with holes that are fully perforated 7/16-inch diameter on 1-inch centers for at least the top 4 inches of the anchor while being truly aligned in the center of the section.

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9. All top posts shall be 14 gauge with holes that are die embossed knockouts on 1-inch centers for the entire length of the post and truly aligned in the center of section.

3.5 REPAIR / RESTORATION [NOT USED]

3.6 RE-INSTALLATION [NOT USED]

3.7 FIELD QUALITY CONTROL [NOT USED]

3.8 SYSTEM STARTUP [NOT USED]

3.9 ADJUSTING [NOT USED]

3.10 CLEANING

A. Wash completed signs with a biodegradable cleaning solution acceptable to the manufactures of the sheeting, colored transparent film, and screen ink to remove grease, oil, dirt, smears, streaks, finger marks, and other foreign material.

B. Wash again before final inspection after erection.

3.11 CLOSEOUT ACTIVITIES [NOT USED]

3.12 PROTECTION [NOT USED]

3.13 MAINTENANCE [NOT USED]

3.14 ATTACHMENTS [NOT USED]

END OF SECTION

Revision Log		
DATE	NAME	SUMMARY OF CHANGE

Docusign Envelope ID: F5CC3F18-8F76-43CC-A962-3C77E53D4E62

EXHIBIT B
DRAWINGS AND SPECIFICATIONS; ON FILE WITH THE PURCHASING AGENT

Docusign Envelope ID: F5CC3F18-8F76-43CC-A962-3C77E53D4E62

EXHIBIT C

CITY OF DENTON

KEY PERSONNEL RESUME FORM

Offerors may attach an organizational chart (maximum of 1 page) as supporting documentation. Please list the key team members that will be assigned to the Project. The Offeror should, at a minimum, provide personnel experience for the Project Manager, Superintendent, and the Foreman/Foremen. Past experience projects should demonstrate experience in the categories listed in 12.2.2.7 of Section 00 21 16 – Instructions to Offerors.

NAME: Garrett Glover
JOB TITLE: Project manager

LICENSES AND CERTIFICATIONS: OSHA 30, First Aid Certified
TOTAL YEARS OF EXPERINCE: 10 + years
TOTAL YEARS WITH CURRENT FIRM: 2 years
RELEVANT EXPERIENCE WITHIN LAST 5YRS., INCLUDE PROJECT ROLES AND RESPONSIBILITIES.
IDENTIFY IF PROJECTS WERE COMPLETED WITH CURRENT OR PREVIOUS FIRM:
Managing all aspects of a project that is given to him. Making sure that everything runs smoothly with the job and that it is getting done in a timely manner. Some of those jobs include:

- McCoy's Reload Phase II - $3.67 million
- Huntsville - Governors Ranch - $11.5 million
- San Marcos townhomes - $507 thousand

LIST OTHER ACTIVE PROJECTS FOR THE DURATION OF THIS PROJECT AND INCLUDE PERCENTAGE OF TIME ALLOCATED FOR EACH: Copunt Rosenberg - 5%

Docusign Envelope ID: F5CC3F18-8F76-43CC-A962-3C77E53D4E62

NAME: Dayton Harrell
JOB TITLE: General Superintendent

LICENSES AND CERTIFICATIONS: OSHA 10
TOTAL YEARS OF EXPERINCE: 5 years
TOTAL YEARS WITH CURRENT FIRM: 5 years
RELEVANT EXPERIENCE WITHIN LAST 5YRS., INCLUDE PROJECT ROLES AND RESPONSIBILITIES.
IDENTIFY IF PROJECTS WERE COMPLETED WITH CURRENT OR PREVIOUS FIRM: Overlooks Many of our current projects and ensures that everything runs smoothly, while dealing with daily operations involving transportation of equipment and certain crews.

LIST OTHER ACTIVE PROJECTS FOR THE DURATION OF THIS PROJECT AND INCLUDE PERCENTAGE OF TIME ALLOCATED FOR EACH: PEC Liberty Hill WH Expansion - 20%

NAME: Jason Reeves
JOB TITLE: Vice President

LICENSES AND CERTIFICATIONS: OSHA 30
TOTAL YEARS OF EXPERINCE: 5 years
TOTAL YEARS WITH CURRENT FIRM: 4 years
RELEVANT EXPERIENCE WITHIN LAST 5YRS., INCLUDE PROJECT ROLES AND RESPONSIBILITIES.
IDENTIFY IF PROJECTS WERE COMPLETED WITH CURRENT OR PREVIOUS FIRM: Dealing directly with the customer and fulfilling their needs for each project. Also, helping out the estimating team. Some projects include:
- Lampasas Business Park - $2.7 million

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- Brushy Mountain - $4.6 Million
- Blessing Ranch - $750 Thousand

LIST OTHER ACTIVE PROJECTS FOR THE DURATION OF THIS PROJECT AND INCLUDE PERCENTAGE OF TIME ALLOCATED FOR EACH: N/A

NAME: Kenny Warr
JOB TITLE: President / Owner

LICENSES AND CERTIFICATIONS: OSHA 10
TOTAL YEARS OF EXPERINCE: 27 Years
TOTAL YEARS WITH CURRENT FIRM: 10 Years
RELEVANT EXPERIENCE WITHIN LAST 5YRS., INCLUDE PROJECT ROLES AND RESPONSIBILITIES.
IDENTIFY IF PROJECTS WERE COMPLETED WITH CURRENT OR PREVIOUS FIRM: Previously the VP of operations and Co-founder of Sprint Energy. Now is President and Owner of Gage & Cade Construction, and managing daily operations.

LIST OTHER ACTIVE PROJECTS FOR THE DURATION OF THIS PROJECT AND INCLUDE PERCENTAGE OF TIME ALLOCATED FOR EACH: N/A

Docusign Envelope ID: F5CC3F18-8F76-43CC-A962-3C77E53D4E62

NAME: Zach Cason
JOB TITLE: Project Manager

LICENSES AND CERTIFICATIONS: OSHA 30

TOTAL YEARS OF EXPERINCE: 10 years

TOTAL YEARS WITH CURRENT FIRM: 2 years

RELEVANT EXPERIENCE WITHIN LAST 5YRS., INCLUDE PROJECT ROLES AND RESPONSIBILITIES.

IDENTIFY IF PROJECTS WERE COMPLETED WITH CURRENT OR PREVIOUS FIRM: Managing all aspects of a project that is given to him. Making sure that everything runs smoothly with the job and that it is getting done in a timely manner. His previous employment was with Pro dirt Services where he was Vice President of construction. He managed the day to day operations of all estimating personell, site work crews, utility crews, and Comercial Sitework.

LIST OTHER ACTIVE PROJECTS FOR THE DURATION OF THIS PROJECT AND INCLUDE PERCENTAGE OF TIME ALLOCATED FOR EACH: City of Round Rock - South Creek channel - 20%

Docusign Envelope ID: F5CC3F18-8F76-43CC-A962-3C77E53D4E62

EXHIBIT D

Alternates

NONE

Docusign Envelope ID: F5CC3F18-8F76-43CC-A962-3C77E53D4E62

EXHIBIT E

ALLOWANCES

None

Docusign Envelope ID: F5CC3F18-8F76-43CC-A962-3C77E53D4E62

SECTION 00 42 44 - UNIT PRICE PROPOSAL FORM - CSP8845

City of Denton - Solid Waste
901-B Texas Street
Denton, TX 76209
<Purchasing Agent>/Purchasing Dept.

From: GAGE AND CADE CONSTRUCTION, LLC
1107 CR 264
BERTRAM, TX 78605

PROJ.: Recycling Center Facility Improvements

RFP:
ENG
PMO:

OFFEROR'S APPLICATION - UNIT PRICE PROPOSAL

Item No.	Spec. Section No.	Description	UOM	BID QTY	Unit Price	Extended Price
1	01-70-00	Mobilization/ Demobilization	LS	1	$ 29,250.00	$ 29,250.00
2	01-50-00	Temporary Controls	LS	1	$ 9,000.00	$ 9,000.00
3	13-00-00	Building Canvas and Appurtenances	LS	1	$ 74,400.00	$ 74,400.00
4	23-90-00	Vents and Fans and Appurtenances	LS	1	$ 43,000.00	$ 43,000.00
5	26-05-00	Electrical and Communications	LS	1	$ 87,000.00	$ 87,000.00
6	31-24-00	Embankment	CY	300	$ 20.80	$ 6,240.00
7	31-23-16	Excavation	CY	700	$ 22.25	$ 15,575.00
8	32-11-23	Flexible base	SF	12,200	$ 4.35	$ 53,070.00
9	03-00-00	Concrete Paving	SF	12,200	$ 14.15	$ 172,630.00
10	32-31-00	Barrier Arms and Appurtenances	LS	1	$ 34,000.00	$ 34,000.00
11	34-41-50	Signs and Striping	LS	1	$ 13,500.00	$ 13,500.00
12	33-14-17	Waterline and Hydrant	LS	1	$ 24,500.00	$ 24,500.00
13	11-90-00	Portable Eyewash/ Shower	LS	1	$ 23,300.00	$ 23,300.00
14						$ -
15						$ -
16						$ -
17						$ -
18						$ -
19						$ -
20						$ -
21						$ -
22						$ -
23						$ -
24						$ -
25						$ -
26						$ -
27						$ -
28						$ -
29						$ -
30						$ -
				TOTAL BASE PROPOSAL:		$585,465.00

Alternate Proposal

1A					$ -	$ -
2A					$ -	$ -
3A					$ -	$ -
				TOTAL ALT. Proposal:		$0.00

TOTAL BASE PLUS ALTERNATE PROPOSAL: $585,465.00

Recycling Center Facility Improvements TOTAL PROPOSAL: $585,465.00

Docusign Envelope ID: F5CC3F18-8F76-43CC-A962-3C77E53D4E62

EXHIBIT G

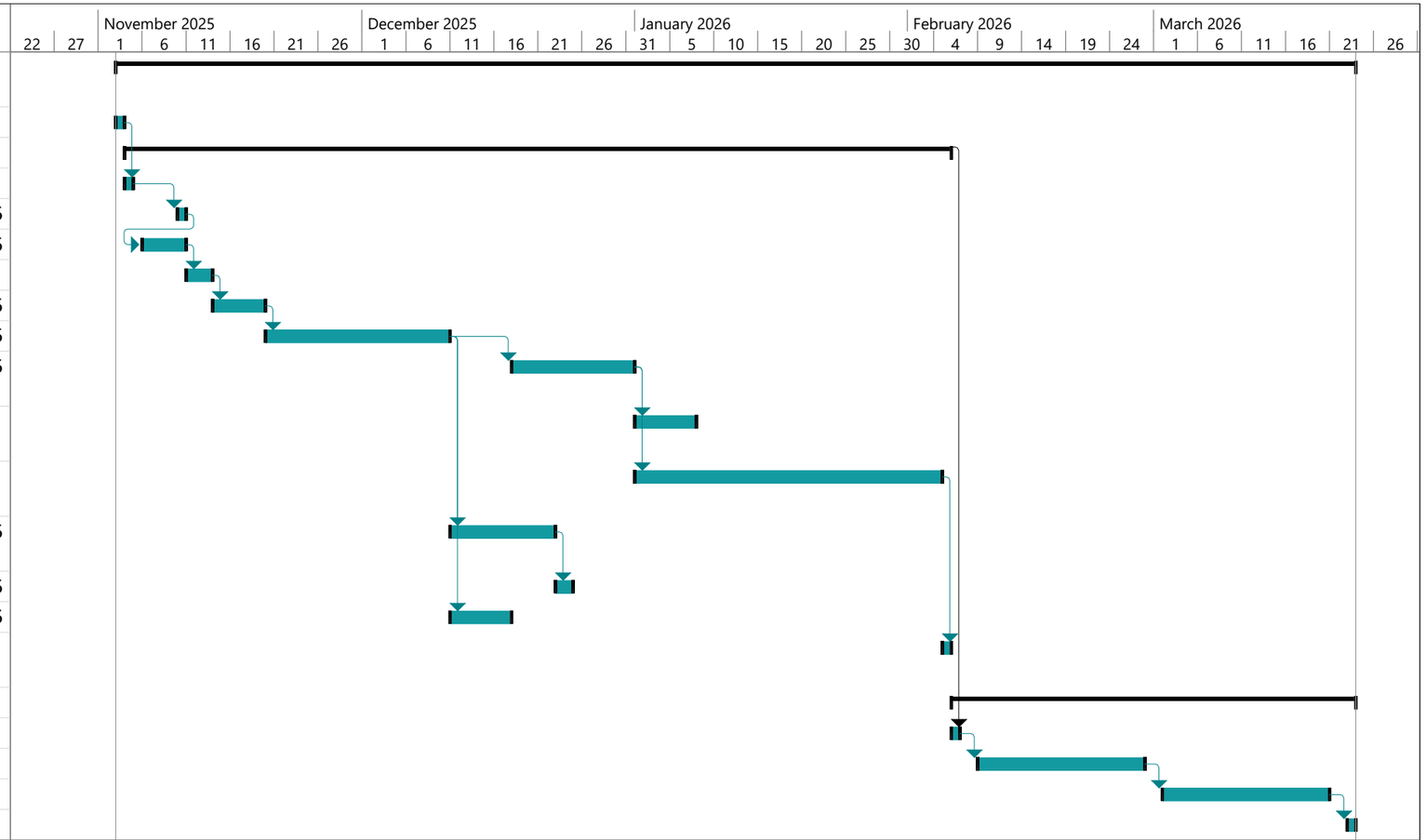
INITIAL SCHEDULE OF VALUES

NONE

Docusign Envelope ID: F5CC3F18-8F76-43CC-A962-3C77E53D4E62

EXHIBIT H

ID	Task Mode	Task Name	Duration	Start	Finish
1		**RECYCLING CENTER FACILITY IMPROVEMENTS**	**101 days**	**Mon 11/3/25**	**Mon 3/23/26**
2		NOTICE TO PROCEED	1 day	Mon 11/3/25	Mon 11/3/25
3		**CONSTRUCTION**	**68 days**	**Tue 11/4/25**	**Thu 2/5/26**
4		MOBILIZATION	1 day	Tue 11/4/25	Tue 11/4/25
5		TEMPORARY CONTROLS	1 day	Mon 11/10/2	Mon 11/10/25
6		EXCAVATION	3 days	Thu 11/6/25	Mon 11/10/25
7		EMBANKMENT	3 days	Tue 11/11/25	Thu 11/13/25
8		FLEXIBLE BASE	4 days	Fri 11/14/25	Wed 11/19/25
9		CONCRETE PAVING	15 days	Thu 11/20/25	Wed 12/10/25
10		BUILDING CANVAS AND APPURTENANCES	10 days	Thu 12/18/25	Wed 12/31/25
11		VENTS AND FANS AND APPURTENANCES	5 days	Thu 1/1/26	Wed 1/7/26
12		ELECTRICAL AND COMMUNICATIONS	25 days	Thu 1/1/26	Wed 2/4/26
13		BARRIER ARMS AND APPURTENANCES	8 days	Thu 12/11/25	Mon 12/22/25
14		SIGNS AND STRIPING	2 days	Tue 12/23/25	Wed 12/24/25
15		WATERLINE AND HYDRAI	5 days	Thu 12/11/25	Wed 12/17/25
16		PORTABLE EYEWASH/ SHOWER	1 day	Thu 2/5/26	Thu 2/5/26
17		**CLOSEOUT**	**32 days**	**Fri 2/6/26**	**Mon 3/23/26**
18		SUBSTANTIAL COMPLETI	1 day	Fri 2/6/26	Fri 2/6/26
19		PUNCH LIST	15 days	Mon 2/9/26	Fri 2/27/26
20		CLOSEOUT DOCS	15 days	Mon 3/2/26	Fri 3/20/26
21		FINAL COMPLETION	1 day	Mon 3/23/26	Mon 3/23/26



Project: SCHEDULE
Date: Tue 9/23/25

Task	Project Summary	Manual Task	Start-only	Deadline
Split	Inactive Task	Duration-only	Finish-only	Progress
Milestone	Inactive Milestone	Manual Summary Rollup	External Tasks	Manual Progress
Summary	Inactive Summary	Manual Summary	External Milestone	

Docusign Envelope ID: F5CC3F18-8F76-43CC-A962-3C77E53D4E62

EXHIBIT I

ESCROW AGREEMENT

NONE

Docusign Envelope ID: F5CC3F18-8F76-43CC-A962-3C77E53D4E62

EXHIBIT J

CONFLICT OF INTEREST QUESTIONNAIRE

FORM CIQ

For vendor doing business with local governmental entity

This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code, by a vendor who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the vendor meets requirements under Section 176.006(a).

By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the vendor becomes aware of facts that require the statement to be filed. *See* Section 176.006(a-1), Local Government Code.

A vendor commits an offense if the vendor knowingly violates Section 176.006, Local Government Code. An offense under this section is a misdemeanor.

OFFICE USE ONLY

Date Received

1 **Name of vendor who has a business relationship with local governmental entity.**

GAGE AND CADE CONSTRUCTION, LLC

2 ☐ **Check this box if you are filing an update to a previously filed questionnaire.** (The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date on which you became aware that the originally filed questionnaire was incomplete or inaccurate.)

3 **Name of local government officer about whom the information is being disclosed.**

_____

Name of Officer

4 **Describe each employment or other business relationship with the local government officer, or a family member of the officer, as described by Section 176.003(a)(2)(A). Also describe any family relationship with the local government officer. Complete subparts A and B for each employment or business relationship described. Attach additional pages to this Form CIQ as necessary.**

A. Is the local government officer or a family member of the officer receiving or likely to receive taxable income, other than investment income, from the vendor?

☐ Yes ☒ No

B. Is the vendor receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer or a family member of the officer AND the taxable income is not received from the local governmental entity?

☐ Yes ☒ No

5 **Describe each employment or business relationship that the vendor named in Section 1 maintains with a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership interest of one percent or more.**

6 ☐ Check this box if the vendor has given the local government officer or a family member of the officer one or more gifts as described in Section 176.003(a)(2)(B), excluding gifts described in Section 176.003(a-1).

7 _____

Signature of vendor doing business with the governmental entity

12/19/23

Date

Docusign Envelope ID: F5CC3F18-8F76-43CC-A962-3C77E53D4E62

CONFLICT OF INTEREST QUESTIONNAIRE
For vendor doing business with local governmental entity

A complete copy of Chapter 176 of the Local Government Code may be found at http://www.statutes.legis.state.tx.us/Docs/LG/htm/LG.176.htm. For easy reference, below are some of the sections cited on this form.

Local Government Code § 176.001(1-a): "Business relationship" means a connection between two or more parties based on commercial activity of one of the parties. The term does not include a connection based on:

(A) a transaction that is subject to rate or fee regulation by a federal, state, or local governmental entity or an agency of a federal, state, or local governmental entity;

(B) a transaction conducted at a price and subject to terms available to the public; or

(C) a purchase or lease of goods or services from a person that is chartered by a state or federal agency and that is subject to regular examination by, and reporting to, that agency.

Local Government Code § 176.003(a)(2)(A) and (B):

(a) A local government officer shall file a conflicts disclosure statement with respect to a vendor if:

***

(2) the vendor:

(A) has an employment or other business relationship with the local government officer or a family member of the officer that results in the officer or family member receiving taxable income, other than investment income, that exceeds $2,500 during the 12-month period preceding the date that the officer becomes aware that

(i) a contract between the local governmental entity and vendor has been executed; or

(ii) the local governmental entity is considering entering into a contract with the vendor;

(B) has given to the local government officer or a family member of the officer one or more gifts that have an aggregate value of more than $100 in the 12-month period preceding the date the officer becomes aware that:

(i) a contract between the local governmental entity and vendor has been executed; or

(ii) the local governmental entity is considering entering into a contract with the vendor.

Local Government Code § 176.006(a) and (a-1)

(a) A vendor shall file a completed conflict of interest questionnaire if the vendor has a business relationship with a local governmental entity and:

(1) has an employment or other business relationship with a local government officer of that local governmental entity, or a family member of the officer, described by Section 176.003(a)(2)(A);

(2) has given a local government officer of that local governmental entity, or a family member of the officer, one or more gifts with the aggregate value specified by Section 176.003(a)(2)(B), excluding any gift described by Section 176.003(a-1); or

(3) has a family relationship with a local government officer of that local governmental entity.

(a-1) The completed conflict of interest questionnaire must be filed with the appropriate records administrator not later than the seventh business day after the later of:

(1) the date that the vendor:

(A) begins discussions or negotiations to enter into a contract with the local governmental entity; or

(B) submits to the local governmental entity an application, response to a request for proposals or bids, correspondence, or another writing related to a potential contract with the local governmental entity; or

(2) the date the vendor becomes aware:

(A) of an employment or other business relationship with a local government officer, or a family member of the officer, described by Subsection (a);

(B) that the vendor has given one or more gifts described by Subsection (a); or

(C) of a family relationship with a local government officer.

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EXHIBIT K

SECTION 00 41 01
PROPOSAL FORM - CSP

TO: City of Denton
c/o: Purchasing Division
901-B Texas Street
Denton, Texas 76209

FOR: CSP 8845 – Recycling Center Facility Improvements

1 Enter into Agreement

The undersigned Offeror proposes and agrees, if this Proposal is accepted, to enter into an Agreement with City in the form included in the Proposal Documents to perform and furnish all Work as specified or indicated in the Contract Documents for the Unit Price Proposal and within the Contract Time indicated in this Proposal and in accordance with the other terms and conditions of the Contract Documents.

2 OFFEROR Acknowledgements and Certification

2.1 In submitting this Proposal, Offeror accepts all of the terms and conditions of the INVITATION TO OFFORERS and INSTRUCTIONS TO OFFORERS, including without limitation those dealing with the disposition of Offeror's Bond.

2.2 Offeror is aware of all costs to provide the required insurance, will do so pending contract award, and will provide a valid insurance certificate meeting all requirements within 14 days of notification of award.

2.3 Offeror certifies that this Proposal is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation.

2.4 Offeror has not directly or indirectly induced or solicited any other Offeror to submit a false or sham Proposal.

2.5 Offeror has not solicited or induced any individual or entity to refrain from proposing.

2.6 Offeror has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Agreement. For the purposes of this Paragraph:

a. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the proposal process.

b. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the proposal process to the detriment of City (b) to establish proposal prices at artificial non-competitive levels, or (c) to deprive City of the benefits of free and open competition.

c. "collusive practice" means a scheme or arrangement between two or more Offerors, with or without the knowledge of City, a purpose of which is to establish proposal prices at artificial, non-competitive levels.

d. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the proposal process or affect the execution of the Contract.

Docusign Envelope ID: F5CC3F18-8F76-43CC-A962-3C77E53D4E62

2.7 The Offeror acknowledges and agrees to comply with the requirements of City Ethics Ordinance No. 23-1165.

3 Time of Completion

3.1 The Work will be Substantially Complete as defined in the General Conditions within 270 Days after the date when the Contract Time commences to run, which is the day indicated in the Notice to Proceed, plus any extension thereof allowed in accordance with Article 8 of the General Conditions.

3.2 The Work will be complete for Final Acceptance within 300 Days after the date when the Contract Time commences to run, which is the day indicated in the Notice to Proceed, plus any extension thereof allowed in accordance with Article 8 of the General Conditions.

3.3 Offeror accepts the provisions of the Agreement as to Liquidated Damages in the event of failure to obtain Milestones (if applicable), Substantial Completion, and Final Acceptance within the times specified in the Agreement.

4 Attached to this Proposal

4.1 The following documents are attached to and made a part of this Proposal:

a. Section 00 35 14 – Conflict of Interest Affidavit – CSP
b. Section 00 41 01 – This Proposal Form – CSP
c. **Section 00 42 44 – Unit Price Proposal Form – CSP – Excel Electronic Copy (either included in the hard copy Proposal, or submitted via Ionwave)**
d. Section 00 43 14 – Required Offeror's Bond – CSP, issued by a surety meeting the requirements of Paragraph 6.01 of the General Conditions.
e. Section 00 43 38 – Proposed Subcontractors Form – CSP
f. Section 00 43 39 – Vendor Compliance to State Law Non-Resident Offeror – CSP
g. Section 00 45 14 – Safety Record Questionnaire – CSP
h. Section 00 45 27 – Contractor Compliance with Workers Compensation Law – CSP
i. Section 00 45 44 – Corporate Resolution of Authorized Signatories – CSP
j. Any additional documents required by Paragraph 12 of Section 00 21 16 – Instructions to Offerors

5 Total Proposal Amount

5.1 Offeror will complete the Work in accordance with the Contract Documents for the following proposal amount. In the space provided below, please enter the total proposed amount for this project. This figure will be read publicly by the City at the proposal opening.

5.2 It is understood and agreed by the Offeror in signing this proposal that the total proposed amount entered below is subject to verification and/or modification by multiplying the unit prices for each pay item by the respective estimated quantities shown in this proposal and then totaling all of the extended amounts.

Total Proposal Amount: $ 585,465.00

Docusign Envelope ID: F5CC3F18-8F76-43CC-A962-3C77E53D4E62

6 Proposal Submittal

6.1 It is understood by Offeror that submission of the total proposal amount is only one of the factors for the City's evaluation process, and that any award of contract will be based on the complete evaluation of the Proposal and Offeror by City under the terms provided in the Instructions to Offerors or any validly issued amendments or addenda.

6.2 This Proposal is submitted on September 24th, 2025 by the entity named below.

Respectfully submitted,

By: _____
(Signature)

Preston Reeves
(Printed Name)

Title: Estimator

Company: Grage and Cade Construction

Address: 1107 CR 2614
Bertram, TX 78605

State of Incorporation: Texas

Email: preston@gragecadeconstruction.com

Phone: 512-734-5869

Receipt is acknowledged of the following Addenda:	Initial
Addenda No. 1:	
Addenda No. 2:	
Addenda No. 3:	
Addenda No. 4:	
Addenda No. 5:	

END OF SECTION

"General Decision Number: TX20250243 03/14/2025

Superseded General Decision Number: TX20240243

State: Texas

Construction Type: Building

County: Denton County in Texas.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(1).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	. Executive Order 14026 generally applies to the contract. . The contractor must pay all covered workers at least $17.75 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2025.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	. Executive Order 13658 generally applies to the contract. . The contractor must pay all covered workers at least $13.30 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2025.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at http://www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/03/2025
1	03/14/2025

ASBE0021-011 06/01/2023

	Rates	Fringes
ASBESTOS WORKER/HEAT & FROST INSULATOR (Duct, Pipe and Mechanical System Insulation)	$ 31.32	7.52

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* BOIL0074-003 01/01/2025

	Rates	Fringes
BOILERMAKER	$ 33.17	24.92

CARP1421-002 10/01/2023

	Rates	Fringes
MILLWRIGHT	$ 32.02	11.27

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* ELEV0021-006 01/01/2025

	Rates	Fringes
ELEVATOR MECHANIC	$ 51.93	38.435+a+b

FOOTNOTES:

A. 6% under 5 years based on regular hourly rate for all hours worked. 8% over 5 years based on regular hourly rate for all hours worked.

B. New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, Christmas Day, and Veterans Day.

ENGI0178-005 06/01/2020

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
(1) Tower Crane	$ 32.85	13.10
(2) Cranes with Pile Driving or Caisson Attachment and Hydraulic Crane 60 tons and above	$ 28.75	10.60
(3) Hydraulic cranes 59 Tons and under	$ 32.35	13.10

IRON0263-005 06/01/2024

	Rates	Fringes
IRONWORKER (ORNAMENTAL AND STRUCTURAL)	$ 28.64	7.93

PLUM0100-008 11/01/2024

	Rates	Fringes
HVAC MECHANIC (HVAC Unit Installation Only)	$ 39.76	14.04

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* SUTX2014-019 07/21/2014

	Rates	Fringes
BRICKLAYER	$ 19.89	0.00
CARPENTER, Excludes Drywall Hanging, Form Work, and Metal Stud Installation	$ 19.25	0.00
CAULKER	$ 16.63 **	0.00
CEMENT MASON/CONCRETE FINISHER	$ 12.93 **	0.00
DRYWALL HANGER AND METAL STUD INSTALLER	$ 15.42 **	0.00
ELECTRICIAN (Alarm Installation Only)	$ 18.83	3.32
ELECTRICIAN (Communication Technician Only)	$ 19.98	3.64
ELECTRICIAN (Low Voltage Wiring Only)	$ 15.80 **	2.18
ELECTRICIAN, Excludes Low Voltage Wiring and Installation of Alarms/Sound and Communication Systems	$ 18.82	0.83
FORM WORKER	$ 12.13 **	0.00
GLAZIER	$ 16.55 **	3.13
HIGHWAY/PARKING LOT STRIPING: Operator (Striping Machine)	$ 10.04 **	2.31
INSTALLER - SIDING (METAL/ALUMINUM/VINYL)	$ 14.74 **	0.00
INSTALLER - SIGN	$ 15.61 **	0.00
INSULATOR - BATT	$ 13.00 **	0.00
IRONWORKER, REINFORCING	$ 14.02 **	0.00
LABORER: Common or General	$ 11.76 **	0.00
LABORER: Mason Tender - Brick	$ 10.54 **	0.00
LABORER: Mason Tender - Cement/Concrete	$ 10.75 **	0.00
LABORER: Pipelayer	$ 13.00 **	0.35
LABORER: Plaster Tender	$ 12.22 **	0.00
LABORER: Roof Tearoff	$ 11.28 **	0.00
LABORER: Landscape and Irrigation	$ 12.50 **	0.48
LATHER	$ 16.00 **	0.00
OPERATOR:		

Backhoe/Excavator/Trackhoe	$ 12.83 **	0.00
OPERATOR: Bobcat/Skid Steer/Skid Loader	$ 13.93 **	0.00
OPERATOR: Bulldozer	$ 18.29	1.31
OPERATOR: Drill	$ 15.69 **	0.50
OPERATOR: Forklift	$ 13.21 **	0.81
OPERATOR: Grader/Blade	$ 12.48 **	0.00
OPERATOR: Loader	$ 13.46 **	0.85
OPERATOR: Mechanic	$ 17.52 **	3.33
OPERATOR: Paver (Asphalt, Aggregate, and Concrete)	$ 18.44	0.00
OPERATOR: Roller	$ 15.04 **	0.00
PAINTER (Brush, Roller and Spray), Excludes Drywall Finishing/Taping	$ 13.21 **	2.33
PAINTER: Drywall Finishing/Taping Only	$ 13.76 **	2.84
PIPEFITTER, Excludes HVAC Pipe Installation	$ 22.98	6.35
PLASTERER	$ 15.75 **	0.00
PLUMBER (HVAC Pipe Installation Only)	$ 22.16	5.46
PLUMBER, Excludes HVAC Pipe Installation	$ 20.84	4.74
ROOFER	$ 17.19 **	0.00
SHEET METAL WORKER (HVAC Duct Installation Only)	$ 20.88	5.19
SHEET METAL WORKER, Excludes HVAC Duct Installation	$ 24.88	5.97
SPRINKLER FITTER (Fire Sprinklers)	$ 22.94	0.00
TILE FINISHER	$ 11.22 **	0.00
TILE SETTER	$ 14.25 **	0.00
TRUCK DRIVER: 1/Single Axle Truck	$ 16.40 **	0.81
TRUCK DRIVER: Dump Truck	$ 12.39 **	1.18
TRUCK DRIVER: Flatbed Truck	$ 19.65	8.57
TRUCK DRIVER: Semi-Trailer Truck	$ 12.50 **	0.00

TRUCK DRIVER: Water Truck.....$ 12.00 ** 4.11

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 ($17.75) or 13658 ($13.30). Please see the Note at the top of the wage determination for more information. Please also note that the minimum wage requirements of Executive Order 14026 are not currently being enforced as to any contract or subcontract to which the states of Texas, Louisiana, or Mississippi, including their agencies, are a party.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at https://www.dol.gov/agencies/whd/government-contracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

The body of each wage determination lists the classifications and wage rates that have been found to be prevailing for the type(s) of construction and geographic area covered by the wage determination. The classifications are listed in alphabetical order under rate identifiers indicating whether the particular rate is a union rate (current union negotiated rate), a survey rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

Union Rate Identifiers

A four-letter identifier beginning with characters other than ""SU"", ""UAVG"", ?SA?, or ?SC? denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2024 in the

example, is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE: UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

Survey Rate Identifiers

The ""SU"" identifier indicates that either a single non-union rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that classification. FL indicates the State of Florida. 2022 is the year of the survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

?SU? wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

State Adopted Rate Identifiers

The ""SA"" identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 01/03/2024 in the example, reflects the date on which the classifications and rates under the ?SA? identifier took effect under state law in the state from which the rates were adopted.

WAGE DETERMINATION APPEALS PROCESS

1) Has there been an initial decision in the matter? This can be:

a) a survey underlying a wage determination
b) an existing published wage determination
c) an initial WHD letter setting forth a position on a wage determination matter
d) an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to davisbaconinfo@dol.gov or by mail to:

Branch of Wage Surveys
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

Regarding any other wage determination matter such as conformance decisions, requests for initial decisions should be directed to the WHD Branch of Construction Wage Determinations. Requests can be submitted via email to BCWD-Office@dol.gov or by mail to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2) If an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via email to dba.reconsideration@dol.gov or by mail to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210.

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END OF GENERAL DECISION"

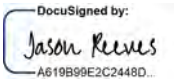
Certificate Of Completion

Envelope Id: F5CC3F18-8F76-43CC-A962-3C77E53D4E62
Status: Sent
Subject: Please DocuSign: City Council Contract 8845 Recycling Center Facility Improvements
Source Envelope:
Document Pages: 312
Signatures: 3
Certificate Pages: 6
Initials: 1
AutoNav: Enabled
EnvelopeId Stamping: Enabled
Time Zone: (UTC-06:00) Central Time (US & Canada)

Envelope Originator:
Crystal Westbrook
901B Texas Street
Denton, TX 76209
crystal.westbrook@cityofdenton.com
IP Address: 198.49.140.104

Record Tracking

Status: Original
11/20/2025 2:52:19 PM
Holder: Crystal Westbrook
crystal.westbrook@cityofdenton.com
Location: DocuSign

Signer Events	Signature	Timestamp
Crystal Westbrook crystal.westbrook@cityofdenton.com Senior Buyer City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign	**Completed** Using IP Address: 198.49.140.104	Sent: 11/20/2025 2:56:29 PM Viewed: 11/20/2025 2:56:40 PM Signed: 11/20/2025 3:01:06 PM
Lori Hewell lori.hewell@cityofdenton.com Purchasing Manager City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign	 Signature Adoption: Pre-selected Style Using IP Address: 198.49.140.104	Sent: 11/20/2025 3:01:18 PM Viewed: 11/20/2025 3:36:42 PM Signed: 11/20/2025 3:38:37 PM
Leah Bush leah.bush@cityofdenton.com Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Accepted: 11/21/2025 4:14:26 PM ID: e970f8d4-1a5e-4dc2-9a6d-5feceedae610	 Signature Adoption: Pre-selected Style Using IP Address: 63.196.246.37	Sent: 11/20/2025 3:52:36 PM Viewed: 11/21/2025 4:14:26 PM Signed: 11/21/2025 5:01:12 PM
Jason Reeves jason@gageandcadeconstruction.com Senior Vice President Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Accepted: 11/21/2025 5:46:32 PM ID: 3769f4cb-3f4a-4b98-a936-1468a6805a05	 Signature Adoption: Pre-selected Style Using IP Address: 2605:59c8:3d5c:7f10:a0e7:c688:6db8:85e Signed using mobile	Sent: 11/21/2025 5:01:24 PM Viewed: 11/21/2025 5:46:32 PM Signed: 11/21/2025 5:46:49 PM

Signer Events	Signature	Timestamp
Brenda Haney brenda.haney@cityofdenton.com Director Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Accepted: 11/24/2025 6:50:56 AM ID: fc0f6b20-f0a1-4c13-b9c5-399758b4a46b	Signed by: Brenda Haney C3C63BE563154A1... Signature Adoption: Pre-selected Style Using IP Address: 198.49.140.10	Sent: 11/21/2025 5:46:59 PM Viewed: 11/24/2025 6:50:56 AM Signed: 11/24/2025 6:51:19 AM
Cheyenne Defee cheyenne.defee@cityofdenton.com Procurement Administration Supervisor City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign		Sent: 11/24/2025 6:51:30 AM
Sara Hensley sara.hensley@cityofdenton.com Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign		
Ingred Rex Ingrid.Rex@cityofdenton.com Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign		

In Person Signer Events	Signature	Timestamp

Editor Delivery Events	Status	Timestamp

Agent Delivery Events	Status	Timestamp

Intermediary Delivery Events	Status	Timestamp

Certified Delivery Events	Status	Timestamp

Carbon Copy Events	Status	Timestamp
Cheyenne Defee cheyenne.defee@cityofdenton.com Procurement Administration Supervisor City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign	COPIED	Sent: 11/20/2025 3:01:18 PM
Marcella Lunn marcella.lunn@cityofdenton.com Senior Deputy City Attorney City of Denton Security Level: Email, Account Authentication (None)	COPIED	Sent: 11/20/2025 3:52:39 PM

Carbon Copy Events	Status	Timestamp
Electronic Record and Signature Disclosure: Not Offered via Docusign		
Gretna Jones gretna.jones@cityofdenton.com Legal Secretary City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign	COPIED	Sent: 11/24/2025 6:51:30 AM Viewed: 11/24/2025 9:03:19 AM
City Secretary Office citysecretary@cityofdenton.com Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign		
Arturo Garcia Arturo.Garcia@cityofdenton.com Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Accepted: 8/6/2025 10:00:39 AM ID: df46fb8c-c5d0-4710-a20b-1eba9b4b97ce		

Witness Events	Signature	Timestamp

Notary Events	Signature	Timestamp

Envelope Summary Events	Status	Timestamps
Envelope Sent	Hashed/Encrypted	11/20/2025 2:56:29 PM

Payment Events	Status	Timestamps

Electronic Record and Signature Disclosure

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If you decide to receive notices and disclosures from us electronically, you may at any time change your mind and tell us that thereafter you want to receive required notices and disclosures only in paper format. How you must inform us of your decision to receive future notices and disclosure in paper format and withdraw your consent to receive notices and disclosures electronically is described below.

Consequences of changing your mind

If you elect to receive required notices and disclosures only in paper format, it will slow the speed at which we can complete certain steps in transactions with you and delivering services to you because we will need first to send the required notices or disclosures to you in paper format, and then wait until we receive back from you your acknowledgment of your receipt of such paper notices or disclosures. To indicate to us that you are changing your mind, you must withdraw your consent using the DocuSign 'Withdraw Consent' form on the signing page of your DocuSign account. This will indicate to us that you have withdrawn your consent to receive required notices and disclosures electronically from us and you will no longer be able to use your DocuSign Express user account to receive required notices and consents electronically from us or to sign electronically documents from us.

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You may contact us to let us know of your changes as to how we may contact you electronically, to request paper copies of certain information from us, and to withdraw your prior consent to receive notices and disclosures electronically as follows:
To contact us by email send messages to: purchasing@cityofdenton.com

To advise City of Denton of your new e-mail address
To let us know of a change in your e-mail address where we should send notices and disclosures electronically to you, you must send an email message to us at melissa.kraft@cityofdenton.com and in the body of such request you must state: your previous e-mail address, your new e-mail address. We do not require any other information from you to change your email address..
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i. decline to sign a document from within your DocuSign account, and on the subsequent page, select the check-box indicating you wish to withdraw your consent, or you may;
ii. send us an e-mail to purchasing@cityofdenton.com and in the body of such request you must state your e-mail, full name, IS Postal Address, telephone number, and account number. We do not need any other information from you to withdraw consent.. The consequences of your withdrawing consent for online documents will be that transactions may take a longer time to process..

Required hardware and software

Operating Systems:	Windows2000? or WindowsXP?
Browsers (for SENDERS):	Internet Explorer 6.0? or above
Browsers (for SIGNERS):	Internet Explorer 6.0?, Mozilla FireFox 1.0, NetScape 7.2 (or above)
Email:	Access to a valid email account
Screen Resolution:	800 x 600 minimum
Enabled Security Settings:	•Allow per session cookies •Users accessing the internet behind a Proxy Server must enable HTTP 1.1 settings via proxy connection

** These minimum requirements are subject to change. If these requirements change, we will provide you with an email message at the email address we have on file for you at that time providing you with the revised hardware and software requirements, at which time you will have the right to withdraw your consent.

Acknowledging your access and consent to receive materials electronically
To confirm to us that you can access this information electronically, which will be similar to other electronic notices and disclosures that we will provide to you, please verify that you were able to read this electronic disclosure and that you also were able to print on paper or electronically save this page for your future reference and access or that you were able to e-mail this disclosure and consent to an address where you will be able to print on paper or save it for your future reference and access. Further, if you consent to receiving notices and disclosures exclusively in electronic format on the terms and conditions described above, please let us know by clicking the 'I agree' button below.
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- Until or unless I notify City of Denton as described above, I consent to receive from exclusively through electronic means all notices, disclosures, authorizations, acknowledgements, and other documents that are required to be provided or made available to me by City of Denton during the course of my relationship with you.

City of Denton

City Hall
215 E. McKinney Street
Denton, Texas
www.cityofdenton.com

AGENDA INFORMATION SHEET

DEPARTMENT: Procurement

ACM: Christine Taylor

DATE: December 15, 2025

SUBJECT

Consider recommending adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute a contract with Techline, Inc., through the Lower Colorado River Authority Contract No. 6941, for the acquisition of electric maintenance, repair, and construction inventory for Denton Municipal Electric to be stocked in the Warehouse and at Denton Municipal Electric; providing for the expenditure of funds therefor; and providing an effective date (File 8947 – awarded to Techline, Inc., in the five (5) year not-to-exceed amount of $6,000,000.00).

INFORMATION/BACKGROUND

The proposed contract is for the supply of electric distribution and transmission maintenance, repair, and operational supplies, which are used by Denton Municipal Electric (DME). This contract intends to supply low usage, one-time buy, and specialty items not covered by any current City agreements. The City will also be able to use this contract to purchase a variety of electric items such as wire, cable, hardware, connectors, splices, and other supplies used by DME.

The purchase of these incidental supplies is necessary so that DME can construct, operate, and maintain overhead and underground electric facilities and provide electric service to new and existing customers. Items are purchased as needed by the Warehouse and by DME. Based on a historical spend and future projections, the recommended not-to-exceed for this contract is $6,000,000 for a total five (5) year contract.

	Warehouse	Electric	Total
Fiscal Year 2026	$725,000	$250,000	$975,000
Fiscal Year 2027	775,000	250,000	1,025,000
Fiscal Year 2028	825,000	250,000	1,075,000
Fiscal Year 2029	875,000	250,000	1,125,000
Fiscal Year 2030	925,000	250,000	1,175,000
Contingency			625,000
Total			**$6,000,000**

Pricing obtained through the Lower Colorado River Authority has been competitively bid and meets the statutory requirements of Texas Local Government Code 271.102.

PRIOR ACTION/REVIEW (COUNCIL, BOARDS, COMMISSIONS)

On December 12, 2006, City Council approved the interlocal agreement with the Lower Colorado River Authority (Ordinance 2006-334).

RECOMMENDATION

Approve a contract with Techline, Inc., for the acquisition of electric maintenance, repair, and construction inventory for Denton Municipal Electric to be stocked in the Warehouse and at Denton Municipal Electric, in a five (5) year not-to-exceed amount of $6,000,000.

PRINCIPAL PLACE OF BUSINESS

Techline, Inc.
Fort Worth, TX

ESTIMATED SCHEDULE OF PROJECT

This is a five (5) year contract. This LCRA contract expires on October 31, 2030.

FISCAL INFORMATION

These items will be funded through the using department's budget on an as-needed basis. The budgeted amount for these items is $6,000,000. The City will only pay for services rendered and is not obligated to pay the full contract amount unless needed.

EXHIBITS

Exhibit 1: Agenda Information Sheet
Exhibit 2: Cooperative Pricing
Exhibit 3: Ordinance

Respectfully submitted:
Lori Hewell, 940-349-7100
Purchasing Manager

For information concerning this acquisition, contact: Keith Kading, 940-349-8438.

Legal point of contact: Marcella Lunn at 940-349-8339.

EXHIBIT C: PRICING

The following shall apply to all pricing:

1) Pricing provided is the delivered price.
2) Products will be purchased on an as-needed basis.
3) Delivery shall be weekly if needed.
4) Unit of Measure (UOM) shall be included for each product.

Volume Discount

Individual purchase orders placed by an LCRA Customer that exceed $40,000 will be quoted and provided at a 1% reduced margin for the total purchase order amount. Orders that exceed $250,000 will be quoted and provided a 2% reduced margin for the total purchase order amount. Volume discounts do not apply to any 5% margin Direct-Ship Orders.

Margin Pricing Calculation

Product pricing: All product pricing, whether listed below or not, shall contain a markup no greater than the percentage listed in the Margin Percentage table beginning on page 51. Upon request, supplier shall furnish the necessary records to confirm pricing conforms to this requirement.

Contract base pricing is valid through 12/29/2025 and will be updated every three (3) months thereafter (with the exception of Wire, Cable, and Bus/Pipe material which may have monthly price adjustments).

CAPACITORS

Manufacturer	Part Number	Description	UOM	Unit Price
ABB	2GUA072100D220	100KVAR Capacitor (Quoting Trinetics Equivalent CPE100A07200B2)	EA	$784.00
Trinetics	CPE100A07200B2	100KVAR Capacitor	EA	$784.00
ABB	2GUA072150D220	150KVAR Capacitor (Quoting Trinetics Equivalent CPE150A07200B2)	EA	$972.00
Trinetics	CPE150A07200B2	150KVAR Capacitor	EA	$972.00
Trinetics	CPE200A07200B2	200KVAR Capacitor	EA	$1,129.00
Trinetics	CPE200B14400B2	200KVAR Capacitor	EA	$1,190.00
ABB	2GUA144200D220	200KVAR Capacitor (Quoting Trinetics Equivalent CPE200B14400B2)	EA	$1,190.00
ABB	2GUA072200D220	200KVAR Capacitor (Quoting Trinetics Equivalent CPE200A07200B2)	EA	$1,129.00
Trinetics	PB03G9Y1XXXXX	300KVAR Cap Bank	EA	$8,369.00
Trinetics	PB06U2Y1UGE6X	600KVAR Cap Bank	EA	$21,892.00
Trinetics	PB06U2Y1XGXXX	600KVAR Cap Bank	EA	$9,716.00
Trinetics	PB06U2Y1UGESXGT002	600KVAR Cap Bank	EA	$21,242.00
Trinetics	PB09G9Y3SXH4X	900KVAR Cap Bank	EA	$22,476.00
Trinetics	PB09G9Y1UXX4X	900KVAR Cap Bank	EA	$17,288.00
Trinetics	CB06FDXXL9YX156	Smart Cap Bank 600KVAR	EA	$20,491.00

LED LIGHTS

Manufacturer	Part Number	UOM	Unit Price

Acuity	ATB0-30BLED-E10	EA	$286.59
Acuity	ATB0-30BLED-E10-MVOLT	EA	$286.59
Acuity	ATB0-20BLED-E70-MVOLT	EA	$223.17
Acuity	ATB0-20BLED-E53-MVOLT	EA	$217.07
Acuity	ATBS E MVOLT R3 XL	EA	$181.83
Acuity	ATBS F MVOLT	EA	$181.83
Acuity	ATBL D MVOLT	EA	$468.29
Acuity	ATBS G MVOLT R3 XL	EA	$185.67
Acuity	ATBM F MVOLT	EA	$295.12
Acuity	ATBS E MVOLT	EA	$181.83
Acuity	ATBS G MVOLT	EA	$185.67

PROTECTIVE EQUIPMENT

Description	UOM	Unit Price
CABLE, GROUNDING, 2/0, TRYSTAR, 37-003-020 - per ft	FT	$6.55
GROUNDING CABLE, 4/0, TRYSTAR CAT. NO. TS4/0, 37-003-040 - per ft	FT	$8.94
TERMINAL, COPPER, SALISBURY SHROUDED, 2/0, THREADED #7600011CT42T	EA	$74.02
ALTERNATIVE TO ITEM ABOVE - CHANCE C600-2624	EA	$48.82
BLANKET, RUBBER, 40 KV, CLASS 4 SALISBURY 900E	EA	$157.82
ALTERNATIVE TO ITEM ABOVE - CHANCE C406-0346	EA	$150.77
CLAMP, C-CLAMP, LARGE, SERRATED, SALISBURY #76600S1E	EA	$241.16
CLAMP, GROUND, FLAT-FACE, #2-4/0 CU., STAINLESS STEEL, SALISBURY T-Handle with teeth 760003T	EA	$245.34
GLOVES, RUBBER SALISBURY, 5KV CLASS 0 SIZE 10; E011Y-10	PR	$88.72
ALTERNATIVE TO ITEM ABOVE - CHANCE PSC011Y-10	PR	$59.43
GLOVES, RUBBER,SALISBURY, 5KV, CLASS 0, SIZE 9 E011Y/9	PR	$88.72
ALTERNATIVE TO ITEM ABOVE - CHANCE PSC011Y-9	PR	$59.43
SALISBURY LEATHER PROTECTOR LOW VOLTAGE SIZE 10/10.5,ILPG-10A PULL STRAP ONLY	PR	$37.07
HOSE, LINE, RUBBER, 6 FEET, 30 KV CLASS 3 SALISBURY OR150-6C	EA	$252.23
SALISBURY LEATHER PROTECTOR LOW VOLTAGE SIZE 9/9.5, ILPG-10A PULL STRAP ONLY	PR	$37.07
GLOVES, RUBBER SALISBURY, 5KV CLASS 0 SIZE 9.5; E011Y-9.5	PR	$88.72
ALTERNATIVE TO ITEM ABOVE - CHANCE PSC011Y-9.5	PR	$59.43
BLANKET, RUBBER, 40 KV, CLASS 4, SPLIT, SALISBURY 1300	EA	$180.00
ALTERNATIVE TO ITEM ABOVE - CHANCE C406-0348	EA	$158.30
GLOVES, RUBBER SALISBURY, ELECTRIFLEX, 20KV CLASS 2 18" CC SIZE 10, NG218CRB/10	PR	$307.32
ALTERNATIVE TO ITEM ABOVE - CHANCE PSC218CRB10	PR	$193.09
SLEEVES, RUBBER SALISBURY 30KV DIPPED EXTRA CURVED ELBOW D3SRY-EC 24"	PR	$846.00
ALTERNATIVE TO ITEM ABOVE - NOVAX 199-3-SM	PR	$685.00
SALISBURY, LEATHER PROTECTOR, CONTOUR CUFF SIZE 10/10.5, ILPG-7C	PR	$44.89
GLOVES, RUBBER SALISBURY, ELECTRIFLEX, 30KV CLASS 3 18" CC SIZE 10, NG318CRB/10	PR	$442.93
ALTERNATIVE TO ITEM ABOVE - CHANCE PSC318CRB-10	PR	$261.00
GLOVES, RUBBER SALISBURY, 5KV CLASS 0 SIZE 10; E011B-10	PR	$79.57

ALTERNATIVE TO ITEM ABOVE - CHANCE PSC011Y-10	PR	$59.43
BLANKET, RUBBER, 20 KV, CLASS 2 SALISBURY 300E	EA	$167.00
ALTERNATIVE TO ITEM ABOVE - CHANCE - PSC4060607 (BLACK)	EA	$146.35
GLOVES, RUBBER SALISBURY, ELECTRIFLEX, 20KV CLASS 2 CC SIZE 10, NG218CYB-10	PR	$322.93
ALTERNATIVE TO ITEM ABOVE - CHANCE PSC218CYB-10	PR	$202.28

CONSIGNED STEEL POLES

Description	Minimum Available	UOM	Unit Price	Location(s) of Stock
Pole, Steel 40 ft cl 3 w/ 3' corrocote	20	EA	$2844.00	Bastrop, Red Rock, Giddings, Llano, Burnet
Pole, Steel 45 ft cl 3 w/ 3' corrocote	20	EA	$3229.00	Bastrop, Red Rock, Giddings, Llano, Burnet
Pole, Steel 50 ft cl 2 w/ 3' corrocote	20	EA	$3688.00	Bastrop, Red Rock, Giddings, Llano, Burnet
Pole, Steel 55 ft cl 2 w/ 3' corrocote	20	EA	$5282.00	Bastrop, Red Rock, Giddings, Llano, Burnet
Pole, 30/FT, Class 4,Galv. Steel, Distr. Type	20	EA	$2625.00	Bastrop, Red Rock, Giddings, Llano, Burnet
Pole, 35/FT, Class 4,Galv. Steel, Distr. Type	20	EA	$2078.00	Bastrop, Red Rock, Giddings, Llano, Burnet
Pole, 40/FT, Class 4,Galv. Steel, Distr. Type	10	EA	$2888.00	Bastrop, Red Rock, Giddings, Llano, Burnet
Pole, 45/FT, Class 4,Galv. Steel, Distr. Type	20	EA	$3055.00	Bastrop, Red Rock, Giddings, Llano, Burnet

Clarifications:

1) The steel poles listed above must be stocked within the LCRA service area.
2) Quantities provided are the (total) minimum stock in the LCRA service area.
3) There should be at least one location "central" to areas East of IH35 and one location "central" to areas West of IH35.
4) The price provided is per pole at the consigned location.

DIRECT-SHIP STEEL POLES

Description	Truckload Quantities	UOM	Unit Price
Pole, Steel 40 ft cl 3 w/ 3' corrocote	65	EA	$2,381.00
Pole, Steel 45 ft cl 3 w/ 3' corrocote	65	EA	$2,693.00
Pole, Steel 50 ft cl 2 w/ 3' corrocote	46	EA	$3,065.00
Pole, Steel 55 ft cl 2 w/ 3' corrocote	36	EA	$4,357.00
Pole, 30/FT, Class 4,Galv. Steel, Distr. Type	102	EA	$2,203.00
Pole, 35/FT, Class 4,Galv. Steel, Distr. Type	75	EA	$1,760.00
Pole, 40/FT, Class 4,Galv. Steel, Distr. Type	75	EA	$2,417.00
Pole, 45/FT, Class 4,Galv. Steel, Distr. Type	65	EA	$2,552.00

TOOLS & SAFETY

Item	Manufacturer	Part Number	Description	UOM	Unit Price
1	TRIYSTAR	37-003-020	2/0 Clear Grounding Cable	FT	$6.55
2	BULLARD	C33R-W	White Full-brim hard hat w/ ratchet suspension	EA	$20.76
3	ESTEX	1829-DP	Tool Aprons	EA	$130.34
4	ESTEX	1830	Bucket Hooks	EA	$7.60
5	H K PORTER	0190FC	24" Bolt cutter with fiberglass handle	EA	$164.93

6	HASTINGS	ST-235	35ft Hot Stick	EA	$649.01
7	HASTINGS	81-814	Disconnect Sticks	EA	$668.60
8	HUBBELL	C600-2630	# 2 Ferrules	EA	$41.26
9	HUBBELL	C600-2614	# 2 Ferrules	EA	$19.34
10	HUBBELL	C600-2276	Grounding Clamps	EA	$81.05
11	HUBBELL	C406-0346	Class 4 Blankets	EA	$150.77
12	HUBBELL	C600-2625	4/0 Ferrules	EA	$45.54
13	HUBBELL	C600-2609	4/0 Ferrules	EA	$23.83
14	HUBBELL	C600-2633	4/0 Ferrules	EA	$41.10
15	KLEIN	D2000-9NE	9" Lineman's pliers w/ACSR cutter	EA	$37.83
16	KLEIN	68202	1/2" x 9/16" Ratcheting box wrench	EA	$19.40
17	SALISBURY	E118RB	CL 1 Rubber Gloves	EA	$186.59
18	SALISBURY	E214RB	CL 2 Rubber Gloves	EA	$177.79
19	SALISBURY	21173	Conductor Cover	EA	$216.27
20	HUBBELL	C403-0292	Hubbell Shotgun	EA	$365.07
21	HASTINGS	567-8	8' hot - stick	EA	$150.30
22	HASTINGS	10-019	Tree Pruner	EA	$238.41
23	HASTINGS	A11000	Tree saw blade	EA	$49.76
24	MILWAUKEE	2678-22BG	Milwaukee 6 TON Crimpers KIT	EA	$2,514.32
25	MILWAUKEE	2672-21S	Milwaukee 477 ACSR Cutter KIT	EA	$2,196.94
26	MILWAUKEE	2764-22	Milwaukee HIGH TORQUE Impact ¾ KIT	EA	$620.73
27	MILWAUKEE	2765-22	Milwaukee Impact 7/16 HEX	EA	$651.82
28	MILWAUKEE	2720-22	Milwaukee saws all KIT	EA	$517.04
29	MILWAUKEE	2354-21	Milwaukee Handheld Light KIT	EA	$98.78
30	MILWAUKEE	2130-20P	Milwaukee tri-pod Light KIT	EA	$248.95
31	MILWAUKEE	2120-20	Milwaukee New Rocket light	EA	$681.71
32	MILWAUKEE	2122-22HD	Milwaukee Bucket Light KIT	EA	$779.27
33	HUBBELL	C601-0162	Mechanical, 15 kV, Jumpers, 1/0 CU, 12 Ft.	EA	$686.87
34	HUBBELL	G4758	Insulated jumper clamp	EA	$312.07
35	HUBBELL	C600-2599	Copper ferrule – 1/0	EA	$22.52
36	VARIOUS	37-221-010	1/0 jumper cable 15kv	FT	$5.00
37	HUBBELL	T600-3091	Bushing Ground Sets, 15kV, 1/0, Yellow	EA	$505.39
38	VARIOUS	TEST	Shot Gun Electrical Testing	EA	$70.00
39	VARIOUS	TEST	Extendo Electrical Testing	EA	$70.00
40	VARIOUS	TEST	8' Hot-Stick electrical testing	EA	$70.00
41	VARIOUS	TEST	Ground set electrical testing	EA	$70.00
42	MILWAUKEE	ALL 6TON	Dies	EA	$46.96
43	ESTEX	2070-R582	Nose bag	EA	$42.90
44	MILWAUKEE	2111-21	Head lamp	EA	$62.32
45	HUBBELL	C406-0348	Rubber Split Blankets	EA	$158.29
46	HUBBELL	C403-2998	Blanket holder tube 1-4	EA	$144.21
47	HUBBELL	C406-0350	Blanket holder clamp	EA	$11.41
48	ESTEX	2651	Compression Tool Holder	EA	$55.63

49	SALISBURY	OR150-6C	Line hose 1.25”X6’	EA	$252.23
50	HUBBELL	C400-2538	Moisture Eater Wipes	EA	$117.56
51	RIPLEY	10327	Cable end stripper	EA	$207.05
52	SPEED SYSTEMS	1700-SS	Semi-Con Scorer	EA	$239.20
53	ESTEX	2190-IL-OSP	Lineman Tools Bag	EA	$118.17
54	KLEIN	NRHD4	3 in one sockets that go on impacts	EA	$214.51
55	RADIANS	19806	Nemesis smoke safety Glasses	EA	$4.93
56	LITTLE MULE	300A	Strap hoist ¾-1-1/2 Ton	EA	$454.01
57	HUBBELL	3011S	Chain hoist 1 Ton	EA	$641.55
58	BUCKINGHAM	2407-100	100’ handline	EA	$395.11
59	KLEIN	1604-20	Guy wire grips	EA	$122.05
60	KLEIN	1656-20	wire grips 1/0	EA	$191.66
61	LIFT-ALL	EN1802DX3	Endless Nylon Slings	EA	$13.41
62	GREENLEE	VW-20H	Personal voltage detector	EA	$470.98
63	GREENLEE	CM-660	Voltmeter	EA	$121.87
64	HUBBELL	H1876-1	Phasing testers	EA	$2,374.63
65	HASTINGS	7701	Voltage Detector	EA	$787.80
66	SENSORLINK	8-020XT PLUS	Ampstick Ammeters	EA	$2,796.34
67	KNOPP	44030	Meter rotation 60-600volts	EA	$572.21
68	BONE SAFETY	SZ-412-S	Spring loaded stand for signs	EA	$93.84
69	BONE SAFETY	RE4848UWAO	Utility work ahead	EA	$92.16
70	KLEIN	KT155T	Lineman wrench 5 IN 1	EA	$100.28
71	HISCO	HIRP-14L	Round Shovel FG 47”	EA	$31.48
72	HK PORTER	0290FCS	Cable Cutter 24"	EA	$156.48
73	HK PORTER	8690FH	Ratchet Cutter- Cuts Steel	EA	$392.90
74	KLEIN	809-36MF	Milled Face Hammer	EA	$54.23
75	RAUKMAN	BW-244	4 in 1 Speed Wrench	EA	$50.65
76	VARIOUS	TEST	Rubber Glove Testing All	EA	$20.00
77	VARIOUS	TEST	Rubber Sleeve Testing All	EA	$20.00
78	Columbus McKinnon	6240	Cant hook	EA	$142.20
79	HASTINGS	HV-240	40' Extendo Stick - Triangle Shape	EA	$624.76
80	RELABLE	REL-BG(MD6)	Compression Tool W/D3-BG	EA	$242.56

TRANSMISSION LINE MATERIAL

Manufacturer	Part Number	Description	UOM	Unit Price
Generic	Footage	# 2 copper black stranded with insulated wire	FT	$2.21
Generic	25#spool=315ft	# 6 copper soft ground wire 250 ft reels	LB	$7.27
Blackburn	W201	#2 wedge service clamps	EA	$4.02
Howard	LU100	100 watt bulbs	EA	$8.48
Hubbell	C8812	12" X 5/8 machine bolts	EA	$1.73
Hubbell	C8814	14" X 5/8 machine bolts	EA	$2.30

Hubbell	C6813 (bolt diam 5/8)	21/4" Square Washers	EA	$0.65
Hubbell	LU250	250 watt bulbs	EA	$8.00
Generic	6CU7STR5KVRISER250R	5 kv bird wire on spools per ft	FT	$0.83
Hubbell	C3512	5/8 Lock nuts	EA	$0.36
Hubbell	C5347	Anchor Rod 5/8" X 7' Twin Eye	EA	$38.10
Hubbell	C88135	Anchor, Expansion 8" (5/8" or 3/4" rod)	EA	$28.12
Preformed	AR0114	Armor Rod #2 ACSR/Guards	EA	$6.44
Preformed	AR0110	Armor Rod #4 ACSR/Guards	EA	$4.33
Hubbell	C8810	Bolt, Machine, 5/8" X 10"	EA	$1.58
Hubbell	C8812	Bolt, Machine, 5/8" X 12"	EA	$1.73
Hubbell	C8814	Bolt, Machine, 5/8" X 14"	EA	$2.30
Hubbell	HUBBELL #BC 2/0	Bronze Hot Line Clamp	EA	$20.37
	3/8EHS-250'CLS	CABLE - GUY 3/8"	FT	$0.61
Neritina	NERITINA-XL-500'CL	CABLE - TRIPLEX #1/0 ACSR (NERITINA)	FT	$1.76
Conch	CONCH-XL-500'CL	CABLE - TRIPLEX #2 ACSR (CONCH)	FT	$1.12
	1/C-#1/0AL-.220-FCN	CABLE, PRIMARY, 1/0, URD, ALUMINUM	FT	$4.76
	COSTENA-XL-1200'NRR	CABLE, QUAD, #1/0, (COSTENA)	FT	$3.19
Hubbell	BH00	Clamp, Bz Hotline #8-2/0	EA	$20.37
Hubbell	BC20	CLAMP, HOTLINE, BRONZE BODY, #8 - #2/0	EA	$20.37
Hubbell	AHLS954022E	Clamp, Stirrup, Alum. HL2-bolt, 336.4-954MCM	EA	$50.56
Blackburn	W201	Clamp, Wedge, W20	EA	$4.02
Blackburn	W401	Clamp, Wedge, W40	EA	$4.57
Blackburn	W621	Clamp, Wedge, W62	EA	$3.07
Thomas & Belts	Thomas & Betts #WR189	Compression Connector 1/0-6 ACSR (#2)	EA	$0.79
Thomas & Belts	Thomas & Betts #WR279	Compression Connector 2/0-1 ACSR (#4)	EA	$1.34
Thomas & Belts	Thomas & Betts #WR159	Compression Connector 2-6 ACSR	EA	$0.74
Generic	Conch 500c	Conch # 2 AL triplex overhead service wire	FT	$1.12
	PVC 300 SCH 80	CONDUIT, PVC, 3", SCHEDULE 80, 10' LENGTH	FT	$2.91
Hubbell	HUBBELL #AHLS024021E	Connector AL Stirrup #2 SOL-4/0 AAC	EA	$34.26
Blackburn	WR 159	Connector, Compression, WR 159	EA	$0.74
Blackburn	WR 189	Connector, Compression, WR 189	EA	$0.79
Blackburn	WR 9	Connector, Compression, WR 9	EA	$0.55
Blackburn	6H3	Connector, Split Bolt, 6H3 Cu	EA	$2.96
	162LRB5240	CONNECTOR, URD, LOADBREAK, ELBOW, 1/0	EA	$60.83
Thomas & Belts	Thomas & Betts #CC44	Copper C-TAP	EA	$2.38
Thomas & Belts	CC46	copper squeeze ons	EA	$2.15
	602080	COVER, AMP CONNECTOR, INSULATING	EA	$5.00
Hubbell	C14322-1P	Crossarm pin 1" thread clamp type	EA	$24.20
Hubbell	C710211PB	Cutout, 100 Amp, 27kV,w/P.G. Conn & Mtg. Brkt.	EA	$99.24
Kaddas	KADDAS #KE1068B GR	Cutout Cover	EA	$23.71
Hubbell	HUBBELL #CMW58	Double Coil Spring Washer 5/8"	EA	$2.72
Hubbell	C3512	EYE NUT 5/8"	EA	$0.36
Hubbell	HUBBELL #1SBM18CLRH	Fiberglass Stand Off 1.5 x 18" Clover	EA	$58.52

Blackburn	G5	Ground Rod Clamp, 5/8"	EA	$2.34
Gamma	8441-70	Insulators 2" spool Ansi 53-1	EA	$1.17
Hubbell	C0341	K-14's clevis	EA	$10.21
Hughes Bros	Hughes Brothers #LS-5/16-2	Lag Screw 5/16" x 2"	EA	$0.14
Hubbell	HUBBELL #8812	Machine Bolt 5/8" x 12"	EA	$1.73
Generic	Neritina 500c	Neritina 1/0 AL triplex overhead service	FT	$1.76
Polaris	Polaris PPT350-412P	NP4-350I Transformer connector 4-350mcm	EA	$16.85
Thomas & Belts	OB 103	OB's 103 H tap	EA	$0.96
Hubbell	HUBBELL #2137155293	PDV100, HD Optima Dist Arrester	EA	$126.06
Acuity	DX124-12A	Photo-cells	EA	$6.79
Hubbell	GEP6	Plate, Pole Eye for 3/4" bolt & 1/2 lag screw	EA	$19.08
	GL402A	Splice, #4 ACSR/AAC; Auto	EA	$8.74
Hubbell	TLS62LTP	Term, Bz Tap Lug, 1 eye-(long), #1/0-500MCM Cu,T	EA	$20.78
Hubbell	TLS62TP	Term, Bz Tap Lug, 1 eye-#1/0-500MCM Cu,TP	EA	$15.15
Hubbell	TLS42TP	Term, Bz Tap Lug, 1 eye-#6-250MCM Cu, TP	EA	$24.16
Hubbell	HUBBELL #TLS62TP	Terminal Bronze Eyebolt Tap Lug	EA	$15.15
Hubbell	HUBBELL #6813	Washer 2.25 Sq. In. x 5/8 In.	EA	$0.65
	SWANATE-600#NRR	WIRE - #4 ACSR (SWANATE)	LB	$3.78
Alcan	SPARATE-600#NRR	WIRE #2 ACSR	LB	$3.45
Nehring	#4AL-TIE-25#BOX-CL	WIRE #4 ALUMINUM TIE	LB	$4.88
Alan	#4SSDBC-25#SPL	WIRE #4 COPPER SOLID	LB	$7.27
Nehring	#6STR-TRW-250'SPL	WIRE #6 RISER	FT	$0.93
Prysmian	1/0-25KV-AL-XLP-FCN	WIRE 1/0 25KV 260MIL PRI URD	FT	$4.00
Alcan	NEHRING-XL-CL	WIRE 1/0 TRIPLEX	FT	$1.76
National Strand	3/8HS-500'CL	WIRE 3/8" GUY	FT	$0.60
Alcan	TULIP-1900#NRR	WIRE 336 AAC	FT	$1.31
Prysmian	4/0-25KV-AL-XLP-FCN	WIRE 4/0 25KV 260MIL PRI URD	FT	$4.93
Alcan	PENGUIN-885#NRR	WIRE 4/0 ACSR	LB	$0.97
Alcan	SWEETBRIAR-XL-1000'NRR	WIRE 4/0 TRIPLEX URD	FT	$2.57
National Strand	7/16HS-500'CL	WIRE 7/16" GUY	FT	$0.92
Nehring	#6AL-TIE-25#BOX-CL	Wire, #6 AL Tie 25# Box;	LB	$4.88
	#6STR-TRW-250'SPL	WIRE, #6, STRANDED, TRANSFORMER RISER	FT	$0.93
	ARBUTUS-SMALL-FT	WIRE, ALUMINUM, 795, ARBUTUS	FT	$3.27
	TULIP-1900#NRR	WIRE, BARE ALUMINUM, 336.4, TULIP	FT	$1.31
Alcan	#6SSDBC-25#SPL	Wire, Copper #6 Solid;S.D.Bare 25#spl (315 ft)	LB	$7.27
	#2STRSDBC-25#SPL	WIRE, COPPER, #2, STRANDED, BARE	LB	$7.27
	6SSBDC-25#SPL	WIRE, COPPER, #6, SOLID, SOFT DRAWN, BARE	LB	$7.27

TRANSFORMERS CONSIGNED

ITEM	City of	Description	Min	Max	UOM	Unit Price	Delivery	Load Loss	No Load Loss	Total Loss

1	Bastrop	25KVA CONV 7.2 120/240;1 Bushing, No Taps	2	3	EA	$1,805.68	In Stock & Included	264	66	330
2	Bastrop	37.5KVA CONV 7.2 120/240;2 Bushing, No Taps	2	3	EA	$2,044.32	In Stock & Included	400	82	482
3	Bastrop	50KVA CONV 7.2 120/240;2 Bushing, No Taps	2	4	EA	$2,477.27	In Stock & Included	461	112	573
4	Bellville	10KVA CONV 7.2 120/240;2 Bushing, No Taps	2	3	EA	$1,257.95	In Stock & Included	150	39	189
5	Bellville	37.5KVA CONV 7.2 120/240;2 Bushing, No Taps	2	4	EA	$2,044.32	In Stock & Included	400	82	482
6	Bellville	25KVA CONV 7.2 120/240;2 Bushing, No Taps	3	5	EA	$1,706.82	In Stock & Included	289	70	359
7	Bellville	15KVA CONV 7.2 120/240;2 Bushing, No Taps	1	1	EA	$1,403.41	In Stock & Included	214	50	264
8	Bellville	37.5KVA 7200 277/480;2 Bushing, No Taps	2	3	EA	$2,131.82	In Stock & Included	423	78	501
9	Bellville	50KVA CONV 7.2 120/240;2 Bushing, No Taps	5	9	EA	$2,477.27	In Stock & Included	461	112	573
10	Brady	15KVA CONV 7.2 120/240;1 Bushing, No Taps	2	3	EA	$1,418.18	In Stock & Included	183	44	227
11	Brady	50KVA CONV 7.2 120/240;2 Bushing, No Taps	1	1	EA	$2,477.27	In Stock & Included	461	112	573
12	Brady	25KVA CONV 7.2 120/240;1 Bushing, No Taps	5	9	EA	$1,805.68	In Stock & Included	264	66	330
13	Brady	37.5KVA CONV 7.2 120/240;2 Bushing, No Taps	2	3	EA	$2,044.32	In Stock & Included	400	82	482
14	Brady	25KVA CONV 7.2 120/240;2 Bushing, No Taps	2	4	EA	$1,706.82	In Stock & Included	289	70	359
15	Brady	15KVA CONV 7.2 120/240;2 Bushing, No Taps	2	4	EA	$1,403.41	In Stock & Included	214	50	264
16	Brady	10KVA CONV 7.2 120/240;2 Bushing, No Taps	2	3	EA	$1,257.95	In Stock & Included	150	39	189
17	Burnet	75KVA Pad 1-PH 7.2;240/120 NT DF LF W&I	2	3	EA	$4,298.86	In Stock & Included	703	173	876
18	Burnet	100KVA Pad 1-PH 7.2;240/120 NT DF LF W&I	1	2	EA	$5,267.05	In Stock & Included	876	212	1088
19	Burnet	50KVA Pad 1-PH 7.2;240/120 NT DF LF W&I	2	4	EA	$3,464.77	In Stock & Included	559	114	673
20	Burnet	25KVA Pad 1-PH 7.2;240/120 NT DF LF W&I	1	2	EA	$2,746.59	In Stock & Included	313	69	382
21	Burnet	10KVA CONV 7.2 120/240;2 Bushing, No Taps	1	2	EA	$1,257.95	In Stock & Included	150	39	189
22	Burnet	15KVA CONV 7.2 120/240;2 Bushing, No Taps	4	8	EA	$1,403.41	In Stock & Included	214	50	264
23	Burnet	100KVA CONV 1-PH;120/240, 2 Bushing, No Taps	2	4	EA	$4,723.86	In Stock & Included	866	169	1035
24	Burnet	25KVA CONV 7.2 120/240;2 Bushing, No Taps	5	9	EA	$1,706.82	In Stock & Included	289	70	359
25	Burnet	25KVA CONV 7200-120/240V;2 Bushing, No Taps	1	2	EA	$1,706.82	In Stock & Included	289	70	359
26	Burnet	50KVA CONV 7.2 120/240;2 Bushing, No Taps	4	8	EA	$2,477.27	In Stock & Included	461	112	573
27	Giddings	75KVA CONV 7.2 120/240;2 Bushing, No Taps	1	1	EA	$3,669.32	In Stock & Included	700	136	836
28	Giddings	15KVA CONV 7.2 120/240;2 Bushing, No Taps	2	3	EA	$1,403.41	In Stock & Included	214	50	264
29	Giddings	25KVA CONV 7.2 120/240;2 Bushing, No Taps	2	3	EA	$1,706.82	In Stock & Included	289	70	359
30	Goldthwaite	37.5KVA CONV 7.2 120/240;1 Bushing, No Taps	1	2	EA	$2,136.36	In Stock & Included	402	82	484
31	Goldthwaite	37.5KVA CONV 7.2 120/240;2 Bushing, No Taps	1	1	EA	$2,044.32	In Stock & Included	400	82	482
32	Goldthwaite	50KVA CONV 7.2 120/240;1 Bushing, No Taps	1	1	EA	$2,648.86	In Stock & Included	463	111	574

33	Goldthwaite	25KVA CONV 7.2 120/240;2 Bushing, No Taps	1	2	EA	$1,706.82	In Stock & Included	289	70	359
34	Goldthwaite	15KVA CONV 7.2 120/240;1 Bushing, No Taps	1	2	EA	$1,418.18	In Stock & Included	183	44	227
35	Goldthwaite	25KVA CONV 7.2 120/240;1 Bushing, No Taps	1	2	EA	$1,805.68	In Stock & Included	264	66	330
36	Gonzales	50KVA CONV 7.2 120/240;2 Bushing, No Taps	2	3	EA	$2,477.27	In Stock & Included	461	112	573
37	Gonzales	15KVA CONV 7.2 120/240;2 Bushing, No Taps	2	4	EA	$1,403.41	In Stock & Included	214	50	264
38	Gonzales	25KVA CONV 7.2 120/240;2 Bushing, No Taps	3	6	EA	$1,706.82	In Stock & Included	289	70	359
39	Lampasas	25KVA CONV 7.2 120/240;1 Bushing, No Taps	6	11	EA	$1,805.68	In Stock & Included	264	66	330
40	Lampasas	37.5KVA CONV 7.2 120/240;1 Bushing, No Taps	2	3	EA	$2,136.36	In Stock & Included	402	82	484
41	Lampasas	50KVA CONV 7.2 120/240;1 Bushing, No Taps	1	2	EA	$2,648.86	In Stock & Included	463	111	574
42	Lampasas	15KVA CONV 7.2 120/240;2 Bushing, No Taps	1	2	EA	$1,403.41	In Stock & Included	214	50	264
43	Lampasas	50KVA CONV 7.2 120/240;2 Bushing, No Taps	2	3	EA	$2,477.27	In Stock & Included	461	112	573
44	Lampasas	15KVA CONV 7.2 120/240;1 Bushing, No Taps	4	8	EA	$1,418.18	In Stock & Included	183	44	227
45	Lampasas	37.5KVA CONV 7.2 120/240;2 Bushing, No Taps	2	3	EA	$2,044.32	In Stock & Included	400	82	482
46	Lampasas	25 KVA Conv 7200 240/480;2Bushing, No Taps	2	3	EA	$1,875.00	In Stock & Included	285	63	348
47	Lampasas	50KVA 7200 240/480 2 Bushing, No Taps	1	1	EA	$2,805.68	In Stock & Included	483	109	592
48	Lampasas	75KVA CONV 7.2 120/240;2 Bushing, No Taps	2	3	EA	$3,669.32	In Stock & Included	700	136	836
49	Lampasas	15 KVA Conv 7200 240/480;2Bushing, No Taps	1	2	EA	$1,634.09	In Stock & Included	151	51	202
50	Lampasas	250KVA Conv 7.2-277/480;2Bushing, No Taps	2	3	EA	$8,471.59	In Stock & Included	1762	341	2103
51	Lampasas	167KVA Conv 7.2-277/480;2Bushing, No Taps	1	2	EA	$6,260.23	In Stock & Included	1234	265	1499
52	Lampasas	10KVA CONV 7.2 120/240;1 Bushing, No Taps	2	4	EA	$1,312.50	In Stock & Included	133	33	166
53	Lampasas	37.5KVA Conv 7200;240/480 2Bushing, No Taps	3	6	EA	$2,127.27	In Stock & Included	379	85	464
54	Lampasas	25KVA CONV 7.2 120/240;2 Bushing, No Taps	3	6	EA	$1,706.82	In Stock & Included	289	70	359
55	Lampasas	100KVA CONV 1-PH;120/240, 2 Bushing, No Taps	2	3	EA	$4,723.86	In Stock & Included	866	169	1035
56	Lampasas	100KVA 7200 240/480 2Bushing, No Taps	1	1	EA	$4,688.64	In Stock & Included	699	203	902
57	Lexington	50KVA CONV 7.2 120/240;2 Bushing, No Taps	2	4	EA	$2,477.27	In Stock & Included	461	112	573
58	Lexington	25KVA CONV 7.2 120/240;2 Bushing, No Taps	3	5	EA	$1,706.82	In Stock & Included	289	70	359
59	Lexington	75KVA CONV 7.2 120/240;2 Bushing, No Taps	1	1	EA	$3,669.32	In Stock & Included	700	136	836
60	Lexington	37.5KVA CONV 7.2 120/240;2 Bushing, No Taps	3	5	EA	$2,044.32	In Stock & Included	400	82	482
61	Lockhart	10KVA CONV 7.2 120/240;2 Bushing, No Taps	1	1	EA	$1,257.95	In Stock & Included	150	39	189
62	Lockhart	1.5KVA CONV 7.2/12470GRY;120/240 W/ARR 1B, No Taps	2	3	EA	$1,042.05	In Stock & Included	31	20	51
63	Lockhart	37.5KVA CONV 7.2 120/240;2 Bushing, No Taps	1	1	EA	$2,044.32	In Stock & Included	400	82	482
64	Luling	15KVA CONV 7.2 120/240;2 Bushing, No Taps	2	4	EA	$1,403.41	In Stock & Included	214	50	264

65	San Saba	50KVA CONV 7.2 120/240;2 Bushing, No Taps	1	1	EA	$2,477.27	In Stock & Included	461	112	573
66	San Saba	25KVA CONV 7.2 120/240;2 Bushing, No Taps	3	5	EA	$1,706.82	In Stock & Included	289	70	359
67	San Saba	37.5KVA CONV 7.2 120/240;2 Bushing, No Taps	2	3	EA	$2,044.32	In Stock & Included	400	82	482
68	San Saba	15KVA CONV 7.2 120/240;2 Bushing, No Taps	3	6	EA	$1,403.41	In Stock & Included	214	50	264
69	Smithville	50KVA CONV 7.2 120/240;2 Bushing, No Taps	1	2	EA	$2,477.27	In Stock & Included	461	112	573
70	Smithville	10KVA CONV 7.2 120/240;2 Bushing, No Taps	3	5	EA	$1,257.95	In Stock & Included	150	39	189
71	Smithville	25KVA CONV 7.2 120/240;2 Bushing, No Taps	3	5	EA	$1,706.82	In Stock & Included	289	70	359
72	Smithville	37.5KVA CONV 7.2 120/240;2 Bushing, No Taps	3	6	EA	$2,044.32	In Stock & Included	400	82	482
73	Weimar	15KVA CONV 7.2 120/240;2 Bushing, No Taps	2	4	EA	$1,403.41	In Stock & Included	214	50	264
74	Weimar	25KVA CONV 7.2 120/240;2 Bushing, No Taps	1	2	EA	$1,706.82	In Stock & Included	289	70	359
75	Weimar	50KVA CONV 7.2 120/240;2 Bushing, No Taps	3	5	EA	$2,477.27	In Stock & Included	461	112	573
76	Weimar	10KVA CONV 7.2 120/240;2 Bushing, No Taps	3	5	EA	$1,257.95	In Stock & Included	150	39	189

Clarifications:

1) Transformers on this list must be consigned at the customer location.
2) Transformers on this list shall be quoted according to the LCRA Loss Evaluation listed below.

   Conventional single phase pole and pad units: $3.75/watt no-load loss and $1.10/watt load (core) loss. Supplier shall supply load and no-load losses for each unit.

TRANSFORMERS STOCK 1-PH & 3-PH

Single Phase Transformers

ITEM	Description	UOM	Price	Delivery	Load Loss	No Load Loss	Total Loss
	Pad Mounted, 1-PH						
1	100KVA Pad 1-PH 7.2KV, 240/120 NT DF LF W&I	EA	$5,512	In Stock & Included	876	212	1088
2	75KVA Pad 1-PH 7.2KV, 240/120 NT DF LF W&I	EA	$4,509	In Stock & Included	703	173	876
3	50KVA Pad 1-PH 7.2KV, 240/120 NT DF LF W&I	EA	$3,646	In Stock & Included	559	114	673
4	25KVA Pad 1-PH 7.2KV, 240/120 NT DF LF W&I	EA	$2,902	In Stock & Included	313	69	382
ITEM	**Description**	**UOM**	**Price**	**Delivery**	**Load Loss**	**No Load Loss**	**Total Loss**
	Conventional, 1PH						
5	100KVA CONV 7.2KV 120/240, 2 Bushing, No taps	EA	$4,781	In Stock & Included	866	169	1035
6	75KVA CONV 7.2KV 120/240, 2 Bushing, No Taps	EA	$3,752	In Stock & Included	700	136	836
7	50KVA CONV 7.2KV, 120/240, 2 Bushing, No Taps	EA	$2,534	In Stock & Included	461	112	573
8	37.5KVA CONV 7.2KV, 120/240, 2 Bushing, No Taps	EA	$2,148	In Stock & Included	400	82	482
9	25KVA CONV 7.2KV 120/240, 2 Bushing, No Taps	EA	$1,795	In Stock & Included	289	70	359
10	15KVA CONV 7.2KV, 120/240, 2 Bushing, No Taps	EA	$1,460	In Stock & Included	151	51	202
11	10KVA CONV 7.2KV, 120/240, 2 Bushing, No Taps	EA	$1,315	In Stock & Included	150	39	189

Clarifications:

1) Transformers must be NEW (not rebuilt or remanufactured).
2) Transformers on this list shall be quoted per LCRA Loss Evaluation listed below.
   Conventional single-phase pole and pad units: $3.75/watt no-load loss and $1.10/watt load (core) loss. Supplier shall supply load and no-load losses for each unit.

Emergency Stock Three Phase Pad Mounted Transformers

Storage of 3PH pad mounted units is currently at the Giddings location. Techline will continue to hold stock which can be accessed 24 hours a day.

ITEM	Description	Description	Minimum Stock	UOM	Price	Delivery	Load Loss	No Load Loss	Total Loss
1	45KVA Pad 3-PH DV	208/120 NT DF LF Bayonet	3	EA	$12,338	In Stock & Included	510	124	634
2	45KVA 3-PH Pad Dual Volt	480/277,DF,LF,NT,W&I	3	EA	$13,743	In Stock & Included	429	143	572
3	75KVA Pad 3PH DV 208/120	DF,LF,NT, Bayonet	3	EA	$14,016	In Stock & Included	822	167	989
4	75KVA Pad 3-PH DV	480/277 NT DF LF Bayonet	3	EA	$14,500	In Stock & Included	837	167	1004
5	112.5KVAPad 3-PH DV	208Y/120,NT,DF,LF BF	3	EA	$14,328	In Stock & Included	1149	228	1377
6	150KVA Pad 3-PH Dual	208/120 NT DF LF Bayonet	3	EA	$16,970	In Stock & Included	1266	317	1583
7	150KVA Pad 3-PH Dual	480/277 NT DF LF Bayonet	3	EA	$17,374	In Stock & Included	1419	299	1718
8	300KVA Pad 3-PH Dual	208/120 NT DF LF Bayonet	4	EA	$22,293	In Stock & Included	2583	486	3069
9	300KVA Pad 3-PH Dual	480/277 NT DF LF Bayonet	4	EA	$19,995	In Stock & Included	2229	567	2796
10	500KVA Pad 3-PH Dual	208/120 NT DF LF Bayonet	4	EA	$31,255	In Stock & Included	3888	698	4586
11	500KVA Pad 3-PH Dual	480/277 NT DF LF Bayonet	4	EA	$25,781	In Stock & Included	3849	719	4568
12	750KVA Pad 3-PH Dual	208/120 NT DF LF Bayonet	3	EA	$40,874	In Stock & Included	5613	897	6510
13	750KVA Pad 3-PH Dual	480/277 NT DF LF Bayonet	3	EA	$32,998	In Stock & Included	5244	999	6243
14	1000KVA Pad 3-PH Dual	480/277 NT DF LF Bayonet	3	EA	$38,438	In Stock & Included	7173	1113	8286
15	1000KVA Pad 3-PH Dual	208/120 NT DF LF Bayonet	3	EA	$48,500	In Stock & Included	7089	1130	8219
16	1500KVA Pad 3-PH Dual	480/277 NT DF LF Bayonet	2	EA	$53,827	In Stock & Included	8892	1705	10597
17	2000KVA 3-PH Pad DV 14.4	480/277,DF,LF,W&I,NT	2	EA	$75,053	In Stock & Included	12381	1873	14254
18	2500KVA Pad 3-PH Dual	480/277 NT DF LF Bayonet	3	EA	$93,058	In Stock & Included	14250	2339	16589

Clarifications:

1) Loading and Delivery of large pad mounted transformers is included in the cost of the transformer at no added cost. The large transformers are to be unloaded by customer at customer's site; however, the Supplier shall load up to a 2,500kva 3 Phase Pad at their approved stocking location and onto a flatbed truck that is available 24 hours per day 365 days per year to deliver.
2) For urgent needs, supplier must have units stocked and deliver within 4 hours.

WATER PRODUCTS

Manufacturer	Part Number	Description	UOM	Unit Price
		FIRE HYDRANTS		
EJIW	70500D	3' BURY NST OL 6" MJ SHOE EJ FIRE HYDRANT	EA	$2,830.57
EJIW	71520D	4' BURY NST OL 6" MJ SHOE EJ FIRE HYDRANT	EA	$2,450.50
EJIW	73525D	5' BURY NST OL 6" MJ SHOE EJ FIRE HYDRANT	EA	$2,563.92
		GATE VALVES		
EJIW	22010	3" MJ X MJ RW OL GATE VALVE, EJIW	EA	$524.01

EJIW	22020	4" MJ X MJ RW OL GATE VALVE, EJIW	EA	$582.23
EJIW	22030	6" MJ X MJ RW OL GATE VALVE, EJIW	EA	$733.07
EJIW	22040	8" MJ X MJ RW OL GATE VALVE, EJIW	EA	$1,180.34
EJIW	22060	12" MJ X MJ RW OL GATE VALVE, EJIW	EA	$2,328.93
EJIW	22070	16" MJ X MJ RW OL GATE VALVE, EJIW	EA	$7,807.10
		SERVICE BRASS MATERIAL		
AY MCDONALD	74704BG34	3/4" BALL CORP STOP MNPT X GRIP NUT CTS, NO LEAD	EA	$73.76
AY MCDONALD	74704BG1	1" BALL CORP STOP MNPT X GRIP NUT CTS, NO LEAD	EA	$97.00
AY MCDONALD	74704BG1.5	1.5" BALL CORP STOP MNPT X GRIP NUT CTS, NO LEAD	EA	$217.40
AY MCDONALD	74704BG2	2" BALL CORP STOP MNPT X GRIP NUT CTS, NO LEAD	EA	$359.58
AY MCDONALD	74602G34	3/4" GRIP X MSN ANGLE STOP, NO LEAD	EA	$60.69
AY MCDONALD	74602G1	1" GRIP X MSN PLUG ANGLE STOP, NO LEAD	EA	$83.02
AY MCDONALD	74602BCSG1.5	1.5" GRIP X MF BALL ANGLE STOP, NO LEAD	EA	$282.77
AY MCDONALD	74602BCSG2	2" GRIP X MF BALL ANGLE STOP, NO LEAD	EA	$362.99
AY MCDONALD	708UGM1.5X3/4X7.5	U-BRANCH, 1.5" GRIP X 3/4" MIP, AY, NO LEAD	EA	$123.94
AY MCDONALD	708UGM1X3/4X7.5	UBRANCH, 1" GRIP X 3/4" MIP X 7.5" WIDE, NO LEAD	EA	$68.71
AY MCDONALD	74620-34X3	3/4" X 3" METER NIPPLE NO-LEAD	EA	$18.00
AY MCDONALD	74620-34X8.5	3/4" X 8.5" MIP X MSN METER NIPPLE, NO LEAD	EA	$38.23
		METER BOXES		
DFW	1200	1200 SINGLE METER BOX 1 IN, 1 OUT	EA	$11.66
DFW	1200.DU	1200 DUAL METER BOX ONLY, 1 IN 2 OUT	EA	$11.66
DFW	1200.1A.LID	1200 DROP IN METER BOXLID WITH READER	EA	$11.07
DFW	1500	1500 SINGLE METER BOX 1 IN, 1 OUT	EA	$23.97
DFW	1500.DU	1500 DUAL METER BOX ONLY 1 IN 2 OUT	EA	$23.97
DFW	1500.1A.LID	1500 DROP IN METER BOXLID WITH READER	EA	$16.36
		PVC PIPE		
JM	DR1406	6" DR-14 C900 PVC GASKET JOINT X 20' CL-200 BLUE	FT	$12.59
JM	DR1408	8" DR-14 C900 PVC GASKET JOINT X 20' CL-200 BLUE	FT	$21.67
JM	DR1412	12" DR14 C900 PVC GASKET JOINT X 20' CL-200 BLUE	FT	$46.69
JM	DR1806	6" DR-18 C900 PVC GASKET JOINT X 20' CL-150 BLUE	FT	$10.16
JM	DR1808	8" DR-18 C900 PVC GASKET JOINT X 20' CL-150 BLUE	FT	$17.44
JM	DR1812	12" DR-18 C900 PVC GASKET JOINT X 20' CL-150 BLUE	FT	$36.87
JM	SR2604	4" SDR-26 HW PVC GJ SEWE R PIPE	FT	$2.72
JM	SR2606	6" SDR-26 HW GJ PVC SEWER PIPE	FT	$6.04
JM	SR2608	8" SDR-26 HW GJ PVC SEWER PIPE	FT	$10.94
JM	SSCH40040BE	4" X 20' SCH-40 PVC BE PIPE - WHITE	FT	$2.03
JM	SSCH40060BE	6" X 20' SCH-40 PVC BE PIPE - WHITE	FT	$3.77
JM	SSCH40080BE	8" X 20' SCH-40 PVC BE PIPE - WHITE	FT	$5.83
JM	SSCH40120BE	12" X 20' SCH-40 PVC BE PIPE - WHITE	FT	$10.87
		DUCTILE IRON PIPE		
MCWANE	GTJ35004	4" CLASS 350 DUCTILE IRON PIPE, TYTON JOINT	FT	$39.19
MCWANE	GTJ35006	6" CLASS 350 DUCTILE IRON PIPE, TYTON JOINT	FT	$26.79
MCWANE	GTJ35008	8" CLASS 350 DUCTILE IRON PIPE, TYTON JOINT	FT	$35.27

MCWANE	GTJ35012	12" CLASS 350 DUCTILE IRON PIPE, TYTON JOINT	FT	$54.06
		COPPER TUBING		
GREAT LAKES	CKSF100	3/4" CTS TYPE K COPPER TUBING	FT	$7.68
GREAT LAKES	CKSG100	1" CTS TYPE K COPPER TUBING	FT	$9.96
GREAT LAKES	CKSG100	1.5" CTS TYPE K COPPER TUBING	FT	$16.50
GREAT LAKES	CKSK060	2" CTS TYPE K COPPER TUBING	FT	$24.30
		HDPE POLY SERVICE TUBING		
ENDOT	PET200F100	3/4" SDR9 HDPE POLY TUBING	FT	$0.32
ENDOT	PET200G100	1" SDR9 HDPE POLY TUBING	FT	$0.54
ENDOT	PET200J100	1.5" SDR9 HDPE POLY TUBING	FT	$1.14
ENDOT	PET200K100	2" SDR9 HDPE POLY TUBING	FT	$1.94
		MUNICIPAL CASTINGS		
SIGMA	VB1651	SHORTY VALVE BOX LID MARKED "WATER"	EA	$13.58
SIGMA	VB1651S	SHORTY VALVE BOX LID MARKED "SEWER"	EA	$13.58
SIGMA	VB1652	SHORTY VALVE BOX BODY ONLY	EA	$40.73
SIGMA	RC32SWR	32" R&C GENERIC SANITARY SEWER	EA	$425.00
SIGMA	RC32STM	32" R&C GENERIC STORM	EA	$425.00
SIGMA	C5	COA VALVE BOX BOOT	EA	$92.96
SIGMA	C6	COA VALVE BOX PAVING RING	EA	$36.56
SIGMA	C7	COA VALVE BOX LID	EA	$24.02
		REPAIR CLAMPS & COUPLINGS		
HYMAX	860-54-0163-16	HYMAX COUPLING, 6.42" - 7.68"	EA	$369.12
HYMAX	860-54-0217-16	HYMAX COUPLING, 8.54" - 9.84"	EA	$416.74
HYMAX	860-54-0272-16	HYMAX COUPLING, 10.7" - 12.00"	EA	$536.11
HYMAX	860-54-0315-16	HYMAX COUPLING, 12.4" - 13.6"	EA	$632.79
HYMAX	860-54-0334-16	HYMAX COUPLING, 13.15" - 14.41"	EA	$757.03
HYMAX	860-54-0378-16	HYMAX COUPLING, 15.00" 17.10"	EA	$1,733.18
JCM	101-0238-7	2" X 7" FULL CIRCLE REPAIR CLAMP	EA	$58.90
JCM	101-0238-12	2" X 12" FULL CIRCLE REPAIR CLAMP	EA	$97.18
JCM	101-0350-7	3" X 7" SS FULL CIRCLE REPAIR CLAMP	EA	$74.14
JCM	101-0350-12	3" X 12" SS FULL CIRCLE REPAIR CLAMP	EA	$112.34
JCM	101-0450-7	4" X 7" SS FULL CIRCLE REPAIR CLAMP	EA	$76.96
JCM	101-0450-12	4" X 12" SS FULL CIRCLE REPAIR CLAMP	EA	$121.52
JCM	101-0690-7	6" X 7" SS FULL CIRCLE REPAIR CLAMP	EA	$91.21
JCM	101-0690-12	6" X 12" SS FULL CIRCLE REPAIR CLAMP	EA	$145.99
JCM	101-0690-18	6" X 18" SS FULL CIRCLE REPAIR CLAMP	EA	$217.97
JCM	101-0905-12	8" X 12" SS FULL CIRCLE REPAIR CLAMP	EA	$171.72
JCM	101-0905-18	8" X 18" SS FULL CIRCLE REPAIR CLAMP	EA	$250.19
		TAPPING SADDLES		
JCM	406-0350-08	3X1 IP TAP SADDLE FOR IPS JCM 406 3.25-3.50	EA	$61.73
JCM	406-0350-14	3X2 IP TAP SADDLE FOR IPS JCM 406 3.25-3.50	EA	$69.78
JCM	406-0450-08	4X1 IP TAP SADDLE FOR IPS JCM 406 4.25-4.50	EA	$62.29
JCM	406-0450-14	4X2 IP TAP SADDLE FOR DIPS JCM 406 4.50-4.80	EA	$73.49

JCM	406-0690-08	6X1 IP TAP SADDLE FOR DIPS JCM 406 6.63-6.90	EA	$71.34
JCM	406-0690-14	6X2 IP TAP SADDLE FOR DIPS JCM 406 6.63-6.90	EA	$83.75
JCM	406-0905-08	8X1 IP TAP SADDLE FOR DI JCM 406 8.63 - 9.05 O	EA	$84.48
JCM	406-0905-14	8X2 IP TAP SADDLE FOR DI JCM 406 8.63 - 9.05	EA	$98.41
JCM	406-1110-08	10X1 IP TAP SADDLE FOR DIPS JCM 406 11.10-11.40	EA	$99.58
JCM	406-1110-14	10X2 IP TAP SADDLE FOR DIPS JCM 406 11.10-11.40	EA	$112.60
JCM	406-1350-08	12X1 IP TAP SADDLE FOR DIPS JCM 406 12.75-13.50	EA	$114.85
JCM	406-1350-14	12X2 IP TAP SADDLE FOR DIPS JCM 406 12.75-13.50	EA	$129.04
JCM	406-1740-08	16X1 IP TAP SADDLE FOR DIPS JCM 406 17.40	EA	$155.17
JCM	406-1740-14	16X2 IP TAP SADDLE FOR DIPS JCM 406 17.40	EA	$168.92
		DUCTILE IRON FITTINGS AND RESTRAINTS		
SIGMA	MJSL04	4" DI MJ X MJ LONG SLEEVE, C153	EA	$79.27
SIGMA	MJSL06	6" DI MJ X MJ LONG SLEEVE, C153	EA	$132.76
SIGMA	MJSL08	8" DI MJ X MJ LONG SLEEVE, C153	EA	$212.67
SIGMA	MJB4504	4" DI MJ 45 DEGREE BEND CEMENT LINED, C153	EA	$74.76
SIGMA	MJB4506	6" DI MJ 45 DEGREE BEND CEMENT LINED, C153	EA	$118.58
SIGMA	MJB4508	8" DI MJ 45 DEGREE BEND CEMENT LINED, C153	EA	$172.71
SIGMA	MJT0404	TEE, MJ X MJ, 4" X 4", DUCTILE IRON	EA	$117.29
SIGMA	MJT0606	TEE, MJ X MJ, 6" X 6", DUCTILE IRON	EA	$209.44
SIGMA	MJT0604	TEE, MJ X MJ, 6" X 4", DUCTILE IRON	EA	$194.62
SIGMA	MJT0808	TEE, MJ X MJ, 8" X 8", DUCTILE IRON	EA	$313.84
SIGMA	MJT0806	TEE, MJ X MJ, 8" X 6", DUCTILE IRON	EA	$259.71
EBAA	2004PEC	4" C900 PVC EBAA MEGALUG W / ACC	EA	$53.46
EBAA	2006PEC	6" C900 PVC EBAA MEGALUG W / ACC	EA	$68.19
EBAA	2008PEC	8" C900 PVC EBAA MEGALUG W / ACC	EA	$91.33
EBAA	2012PEC	12" C900 PVC EBAA MEGALUG W / ACC	EA	$163.26
		SEWER FITTINGS		
PLASTIC TRENDS	P1404	4" FIP X SEWER HUB ADAPTER	EA	$6.53
PLASTIC TRENDS	P1406	6" FIP X SEWER HUB ADAPTER	EA	$30.87
PLASTIC TRENDS	P1154	4" RAISED MIP PLUG	EA	$3.98
PLASTIC TRENDS	P1156	6" RAISED MIP PLUG	EA	$19.97
PLASTIC TRENDS	321-0004	4" SCH40 DWV 45 DEGREE BEND	EA	$17.16
PLASTIC TRENDS	321-0006	6" SCH40 DWV 45 DEGREE BEND	EA	$30.96
PLASTIC TRENDS	H304	4" X 4" GASKETED WYE SDR26 HW SEWER	EA	$59.26
PLASTIC TRENDS	H306	6" X 6" GASKETED WYE SDR26 HW SEWER	EA	$96.32
PLASTIC TRENDS	H308-6	8" X 6" GASKETED WYE SDR26 HW SEWER	EA	$125.17
PLASTIC TRENDS	H308	8" X 8" GASKETED WYE SDR26 HW SEWER	EA	$218.86
PLASTIC TRENDS	H1654	4" X 4" SDR26 COMBO WYEW/ 45 BEND	EA	$71.74
PLASTIC TRENDS	H1656	6" X 6" SDR26 COMBO WYEW/ 45 BEND	EA	$113.74
PLASTIC TRENDS	H1656-4	6" X 4" SDR26 COMBO WYEW/ 45 BEND	EA	$84.32
		SCHEDULE 40 & SCHEDULE 80 PVC FITTINGS		
SPEARS	401-020	PVC TEE, 2" X 2" X 2", SCH 40, S X S	EA	$2.55
SPEARS	401-030	PVC TEE, 3" X 3" X 3", SCH 40, S X S	EA	$11.04

SPEARS	406-020	PVC ELBOW, 2", 90 DEG, SCH 40, S X S	EA	$2.06
SPEARS	406-030	PVC ELBOW, 3", 90 DEG, SCH 40, S X S	EA	$7.53
SPEARS	417-020	PVC ELBOW, 2", 45 DEG SCH 40, S X S	EA	$2.42
SPEARS	417-030	PVC ELBOW, 3", 45 DEG SCH 40, S X S	EA	$9.78
SPEARS	429-020	PVC COUPLING, 2", SCH 40, S X S	EA	$1.23
SPEARS	429-030	PVC COUPLING, 3", SCH 40, S X S	EA	$4.27
SPEARS	435-020	PVC FEMALE ADAPTER, 2", SCH 40, S X FIPT	EA	$1.35
SPEARS	435-030	PVC FEMALE ADAPTER, 3", SCH 40, S X FIPT	EA	$4.62
SPEARS	435-020	PVC MALE ADAPTER, 2.", SCH 40, S X MIPT	EA	$1.32
SPEARS	436-030	PVC MALE ADAPTER, 3.", SCH 40, S X MIPT	EA	$5.72
SPEARS	447-010	PVC CAP, 1" SCH 40 SOCKET	EA	$5.71
SPEARS	447-015	PVC CAP, 1.5" SCH 40 SOCKET	EA	$0.89
SPEARS	447-020	PVC CAP, 2" SCH 40 SOCKET	EA	$1.06
SPEARS	829-020	PVC COUPLING, 2", SCH 80, S X S	EA	$7.87
SPEARS	829-030	PVC COUPLING, 3", SCH 80, S X S	EA	$22.25
SPEARS	829-040	PVC COUPLING, 4", SCH 80, S X S	EA	$27.86
SPEARS	835-020	2" SCH-80 FIP ADAPTE R	EA	$22.79
SPEARS	835-040	4" SCH-80 FIP ADAPTER	EA	$69.63
SPEARS	836-020	2" SCHEDULE 80 S X MIP ADAPTER	EA	$17.38

WOOD POLES

Stock Wood Poles in Less Than Truck Load Quantities

Description	Minimum Order	UOM	Unit Price
Pole, Wood 30 ft cl 4 Creosote	1	EA	$820.00
Pole, Wood 35 ft cl 4 Creosote	1	EA	$1,055.00
Pole, Wood 40 ft cl 4 Creosote	1	EA	$1,308.00
Pole, Wood 40 ft cl 3 Creosote	1	EA	$1,512.00
Pole, Wood 45 ft cl 3 Creosote	1	EA	$1,820.00
Pole, Wood 50 ft cl 3 Creosote	1	EA	$2,185.00
Pole, Wood 55 ft cl 2 Creosote	1	EA	$2,906.00

Direct Ship Wood Poles Truck Load Quantities

Description	Truckload	UOM	Unit Price
Pole, Wood 30 ft cl 4 Creosote	54	EA	$303.00
Pole, Wood 35 ft cl 4 Creosote	42	EA	$389.00
Pole, Wood 40 ft cl 4 Creosote	34	EA	$483.00
Pole, Wood 40 ft cl 3 Creosote	29	EA	$558.00
Pole, Wood 45 ft cl 3 Creosote	24	EA	$671.00
Pole, Wood 50 ft cl 3 Creosote	20	EA	$806.00

Pole, Wood 55 ft cl 2 Creosote	15	EA	$1,071.00

MARGIN PERCENTAGE

The following table represents the margins in this contract, which shall not be exceeded.

Product Categories: Electric Utility	Margin
Wire & Cable	14%
Wire & Cable Direct-Ship from Manufacturer in TL Quantities	5%
Single Phase Pole Type Transformers	12%
Single Phase Pad Mount Transformers	15%
Three Phase Pad Mount Transformers	14%
Transformers Direct-Ship from Manufacturer	5%
Hardware	14%
Underground Products	18%
Connectors & Splices	18%
Wood Pole Products Direct-Ship in Truck Load Quantities	5%
Wood Pole Products Out of Stock in LTL Quantities	35%
Steel Poles Direct-Ship in Truck-Load Quantities	5%
Steel Poles Out of Stock in LTL Quantities	23%
Street Light Poles	15%
Pad Mount Switchgear – Drop Ship	5%
Pad Mount Switchgear – Out of Stock	20%
Cross Arms	15%
All Remaining Products	18%
Water Products	**Margin**
Pipe 4" & less	15%
Pipe 6" & greater	10%
Valves & Hydrants 4" & greater	12%
Fittings (PVC & Ductile) 4" & greater	14%
Fittings (PVC & Ductile) 3" & less	17%
Restraint Devices All	15%
Service Clamps and Couplings 4" & greater	14%
Service Clamps and Couplings 3" & less	16%
Service Brass 2" & less	15%
Galv, Sch40 & Sch80 Fittings 2" & less	18%
Service & Tap Saddles All	14%

ORDINANCE NO. _____

AN ORDINANCE OF THE CITY OF DENTON, A TEXAS HOME-RULE MUNICIPAL CORPORATION, AUTHORIZING THE CITY MANAGER TO EXECUTE A CONTRACT WITH TECHLINE, INC., THROUGH THE LOWER COLORADO RIVER AUTHORITY CONTRACT NO. 6941, FOR THE ACQUISITION OF ELECTRIC MAINTENANCE, REPAIR, AND CONSTRUCTION INVENTORY FOR DENTON MUNICIPAL ELECTRIC TO BE STOCKED IN THE WAREHOUSE AND AT DENTON MUNICIPAL ELECTRIC; PROVIDING FOR THE EXPENDITURE OF FUNDS THEREFOR; AND PROVIDING AN EFFECTIVE DATE (FILE 8947 – AWARDED TO TECHLINE, INC., IN THE FIVE (5) YEAR NOT-TO-EXCEED AMOUNT OF $6,000,000.00).

WHEREAS, pursuant to Ordinance 2006-334, the Lower Colorado River Authority has solicited, received, and tabulated competitive bids for the purchase of necessary materials, equipment, supplies, or services in accordance with the procedures of state law on behalf of the City of Denton; and

WHEREAS, the City Manager, or a designated employee, has reviewed and recommended that the herein described materials, equipment, supplies, or services can be purchased by the City through the Lower Colorado River Authority at less cost than the City would expend if bidding these items individually; and

WHEREAS, this procurement was undertaken as part of the City's governmental function; and

WHEREAS, the City Council has provided in the City Budget for the appropriation of funds to be used for the purchase of the materials, equipment, supplies, or services approved and accepted herein; NOW, THEREFORE,

THE COUNCIL OF THE CITY OF DENTON HEREBY ORDAINS:

SECTION 1. The items shown in the "File Number" referenced herein and on file in the office of the Purchasing Agent, are hereby accepted and approved as being the lowest responsible bids for such items:

FILE NUMBER	VENDOR	AMOUNT
8947	Techline, Inc.	$6,000,000.00

SECTION 2. By the acceptance and approval of the items set forth in the referenced file number, the City accepts the offer of the persons submitting the bids to the Lower Colorado River Authority for such items and agrees to purchase the materials, equipment, supplies, or services in accordance with the terms, conditions, specifications, standards, quantities, and for the specified sums contained in the bid documents and related documents filed with the Lower Colorado River Authority and the purchase orders issued by the City.

SECTION 3. Should the City and persons submitting approved and accepted items set forth in the referenced file number wish to enter into a formal written agreement as a result of the City's ratification of bids awarded by the Lower Colorado River Authority, the City Manager, or their designated representative, is hereby authorized to execute the written contract which shall be referenced herein; provided that the written contract is in accordance with the terms, conditions, specifications, and standards contained in the Proposal submitted to the Lower Colorado River Authority, and related documents herein approved and accepted.

SECTION 4. The City Council of the City of Denton hereby expressly delegates the authority to take any actions that may be required or permitted to be performed by the City of Denton under this ordinance to the City Manager of the City of Denton, or their designee.

SECTION 5. By the acceptance and approval of the items set forth in the referenced file number, the City Council hereby authorizes the expenditure of funds therefor in the amount and in accordance with the approval purchase orders or pursuant to a written contract made pursuant thereto as authorized herein.

SECTION 6. This ordinance shall become effective immediately upon its passage and approval.

The motion to approve this ordinance was made by _____ and seconded by _____. This ordinance was passed and approved by the following vote [___ - ___]:

	Aye	**Nay**	**Abstain**	**Absent**
Mayor Gerard Hudspeth:	_____	_____	_____	_____
Vicki Byrd, District 1:	_____	_____	_____	_____
Brian Beck, District 2:	_____	_____	_____	_____
Suzi Rumohr, District 3:	_____	_____	_____	_____
Joe Holland, District 4:	_____	_____	_____	_____
Brandon Chase McGee, At Large Place 5:	_____	_____	_____	_____
Jill Jester, At Large Place 6:	_____	_____	_____	_____

PASSED AND APPROVED this the _____ day of _____, 2025.

_____
GERARD HUDSPETH, MAYOR

ATTEST:
INGRID REX, CITY SECRETARY

BY: _____

APPROVED AS TO LEGAL FORM:
MACK REINWAND, CITY ATTORNEY

BY: Leah Bush

City of Denton

City Hall
215 E. McKinney Street
Denton, Texas
www.cityofdenton.com

AGENDA INFORMATION SHEET

DEPARTMENT: Procurement

ACM: Christine Taylor

DATE: December 15, 2025

SUBJECT

Consider recommending adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, ratifying the expenditure of funds by the City Manager, for the emergency purchase of switchgears for Denton Municipal Electric; and providing an effective date (File 8954 – awarded to Texas Electric Cooperatives, Inc., in the not-to-exceed amount of $260,200.00).

STRATEGIC ALIGNMENT

This action supports Key Focus Area: Enhance Infrastructure and Mobility.

INFORMATION/BACKGROUND

This Declaration of Emergency is for switchgears needed to provide restoration of, and service to customers. It is founded on current supply chain issues being experienced across the electric utility industry, including Denton Municipal Electric (DME). All current projects have zero (0) switchgears/switches for outages; the purchase is for new 25kV switches.

Section 252.022 of the Texas Local Government Code provides exemptions associated with purchasing requirements, which include (1) a procurement made because of a public calamity that requires the immediate appropriation of money to relieve the necessity of the municipality's residents..., and (2) a procurement necessary to preserve or protect the public health or safety of the municipality's residents.

Denton's current inventory of switchgears is at levels reserved for normal, daily electric service operational responsibilities and emergency response. For new construction, DME prioritizes switchgears on a first-come, first-ready basis for customers and developers who have inspections and permits complete.

Supply chain issues for distribution assets continue to be an issue for DME. Major shortages are being experienced nationwide of critical electric utility equipment such as electric distribution transformers, underground cable, substation equipment, and other equipment necessary to maintain and provide for electric service in Denton. The need for this Declaration of an Emergency stems from lead times on switchgears approaching 56 weeks in some instances. Vendors cannot provide reliable estimates of lead times for equipment, and many of our switchgears on order have been pushed back. Table 1 provides a list of orders for switchgears needed under this Declaration of an Emergency to help mitigate some of the supply chain issues and help support DME's stock levels of switchgears. Failure to declare an emergency could cause inventory levels to drop further below minimum acceptable levels, while also halting large construction projects like Hunter Ranch.

Table 1

Transformer Size	Transformer Cost	Quantity	Total Cost
S&C 422 Switchgear	$65,050	4	$260,200
		Purchase Order Total Cost	$260,200

Approval of a Declaration of an Emergency, with a one-time spend authority of $260,200, allows DME to better position its switchgear inventory for service and minimize the growing backlog of switchgear orders.

RECOMMENDATION

Approve the emergency purchase of switchgears for Denton Municipal Electric, in the estimated expenditure amount of $260,200.

PRINCIPAL PLACE OF BUSINESS

Texas Electric Cooperatives, Inc.
Georgetown, TX

ESTIMATED SCHEDULE OF PROJECT

This is a single purchase processed as an Emergency Declaration. Delivery of the switchgears was on Wednesday, November 5, 2025.

FISCAL INFORMATION

These items will be funded from Denton Municipal Electric Capital Improvement Program. Purchase Order #212844 has been entered into the Purchasing software system in the amount of $260,200. The budgeted amount for this item is $260,200.

EXHIBITS

Exhibit 1: Agenda Information Sheet
Exhibit 2: Quote
Exhibit 3: Ordinance

Respectfully submitted:
Lori Hewell, 940-349-7100
Purchasing Manager

For information concerning this acquisition, contact: Randy Key, 940-349-7665.

Legal point of contact: Marcella Lunn at 940-349-8333.

Texas Electric Cooperatives

Your Touchstone Energy® Partner

P.O. Box 201338
Dallas, TX 75320-1338

NOV 04 2025

Invoice	INV01777541
Date	10/29/2025
Order #	ORD0906894.2
Page	1

INVOICE

Bill To:

City Of Denton
Accounts Payable
215 E. Mckinney St.
Denton TX 76201-4299

Received 1 pc
PO 212844
11/4/2025 MC

Ship To:

City Of Denton Electrical Distribution
Mike Cox
1701 C Spencer RD
Denton TX 76205

Purchase Order No.	Customer ID	Salesperson ID	Shipping Method	Payment Terms	Cust Req Date	Master No.
212844	11137	MONTGOMERY	LOCAL DELIVERY	NET 15	10/29/2025	2,405,123

Ordered	Shipped	B/O	Item Number Customer Item Number	Description	Unit Price	Ext. Price
1	1	0	934223-P4T0 934223-P4T0	SWITCHGEAR PADMOUNT 2-600SW 2-200VFI	$65,050.0000	$65,050.00

Remit to:
Texas Electric Cooperatives
P.O. Box 201338
Dallas, TX 75320-1338

Bank Information for ACH payments:
Remittance information: achpayments@texas-ec.org
Wells Fargo Bank
121000248 (Routing) 4945039030 (Account)

Subtotal	$65,050.00
Trade Discount	$0.00
Misc	$0.00
Tax	$0.00
Freight	$0.00
Payment Rec'd.	$0.00
Total Due	$65,050.00

R43510 CITY OF DENTON Date - 11/4/2025 | Receipt Date - 11/4/2025
COD00004 Purchase Receiver Print Time - 15:09:41
Page - 1

Receiver - 212844- 000 - OP
Supplier - 1142457

Ship From TEXAS ELECTRIC COOPERATIVES INC
1122 COLORADO ST 24TH FLOOR
AUSTIN TX 78701

Ship To CITY OF DENTON ELECTRICAL DIST
1701 C SPENCER RD
DENTON TX 76205

Order Date 10/20/2025 Supplier 00002 | Ordered By 2482971
Requested 10/20/2025 Order Taken By 3039867

Account / Item Number	Description	UM	Ordered	Unit Cost	Extended Price	Dist./Line Number	Open	Received
28579409	SWITCHGEAR, VISTA 422 **24KV*EA		4	65,050.0000	260,200.00	1.000		
28579409	PY- 6- PME 9 600A ATO EQUIV.							

10/20/2025 This is a Declaration of Emergency purchase per Randy Key.

260,200.00

Rec'd me 11/4/25

Texas Electric Cooperatives
Your Touchstone Energy® Partner
100 Cooperative Way
Georgetown, TX 78626

PACKING SLIP

Order #	ORD0906894.2
Doc Date	10/21/2025

COMMENT

Bill To: Accounts Payable
215 E. Mckinney St.
Denton, TX 76201-4299

Ship To: City Of Denton Electrical Distribution
1701 C Spencer RD
Denton, TX 76205

PO Number	Customer		SalesPerson	Shipping Method	Customer Required Date	Master Number	
212844	11137		MONTGOMERY	LOCAL DELIVERY	10/29/2025	2405123	
Ordered	**Shipped**	**B/O**	**Item**	**Cust Item**	**Desc**	**U of M**	**Bin**
			Serial/Lot	**Serial/Lot Qty**	**Mfg Date**	**Expn Date**	
1	1	0	934223-P4T0		SWITCHGEAR PADMOUNT 2-600SW 2-200VFI	EA	

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By:TEXAS-EC\intouch

Picked By : cthompson

ORDINANCE NO. _____

AN ORDINANCE OF THE CITY OF DENTON, A TEXAS HOME-RULE MUNICIPAL CORPORATION, RATIFYING THE EXPENDITURE OF FUNDS BY THE CITY MANAGER, FOR THE EMERGENCY PURCHASE OF SWITCHGEARS FOR DENTON MUNICIPAL ELECTRIC; AND PROVIDING AN EFFECTIVE DATE (FILE 8954 – AWARDED TO TEXAS ELECTRIC COOPERATIVES, INC., IN THE NOT-TO-EXCEED AMOUNT OF $260,200.00).

WHEREAS, state law and city policy requires that certain contracts requiring an expenditure or payment by the city in an amount exceeding $50,000 be by competitive bids, except in the case of public calamity where it becomes necessary to act at once to appropriate money to relieve the necessity of the citizens of the city, or in case of unforeseen damage to public property, machinery, or equipment, or where the procurement is necessary to preserve or protect the public health or safety of the city's residents under Section 252 of the Local Government Code; and

WHEREAS, the City Manager has recommended to the City Council that it is necessary to ratify the purchase of goods or services due to the following emergency conditions outlined in the memorandum referenced herein; NOW, THEREFORE,

THE COUNCIL OF THE CITY OF DENTON HEREBY ORDAINS:

SECTION 1. The City Council hereby determines that there is a public calamity that makes it necessary to act at once to appropriate money to relieve the necessity of the citizens of the city, or to provide for unforeseen damage to public property, machinery, or equipment, or to preserve or protect the public health or safety of the city's residents, and by reason thereof, the following emergency purchases of materials, equipment, supplies, or services, as described in the "Declaration of Emergency Memorandum" referenced herein and on file in the office of the Purchasing Agent, are hereby approved:

FILE NUMBER	VENDOR	AMOUNT
8954	Texas Electric Cooperatives, Inc.	$260,200.00

SECTION 2. Because of such emergency, the City Manager, or a designated employee, is hereby authorized to purchase the materials, equipment, supplies, or services as described in the Memorandum on file in the office of the Purchasing Agent, and to make payment therefore in the amounts therein stated. Such emergency purchases, being in accordance with the provisions of state law, exempt such purchases by the city from the requirements of competitive bids.

SECTION 3. The City Council of the City of Denton hereby expressly delegates the authority to take any actions that may be required or permitted to be performed by the City of Denton under this ordinance to the City Manager of the City of Denton, or their designee.

SECTION 4. This ordinance shall become effective immediately upon its passage and approval.

The motion to approve this ordinance was made by _____ and seconded by _____. This ordinance was passed and approved by the following vote [___ - ___]:

	Aye	**Nay**	**Abstain**	**Absent**
Mayor Gerard Hudspeth:	_____	_____	_____	_____
Vicki Byrd, District 1:	_____	_____	_____	_____
Brian Beck, District 2:	_____	_____	_____	_____
Suzi Rumohr, District 3:	_____	_____	_____	_____
Joe Holland, District 4:	_____	_____	_____	_____
Brandon Chase McGee, At Large Place 5:	_____	_____	_____	_____
Jill Jester, At Large Place 6:	_____	_____	_____	_____

PASSED AND APPROVED this the _____ day of _____, 2025.

_____
GERARD HUDSPETH, MAYOR

ATTEST:
INGRID REX, CITY SECRETARY

BY: _____

APPROVED AS TO LEGAL FORM:
MACK REINWAND, CITY ATTORNEY

BY: Leah Bush _____

CITY OF DENTON PUBLIC UTILITIES BOARD MINUTES
October 27, 2025

After determining that a quorum was present of the Public Utilities Board of the City of Denton, convened in a Regular Meeting on Monday, October 27, 2025, at 9:00 a.m. in the Council Work Session Room at City Hall, 215 E. McKinney Street, Denton, Texas.

PRESENT: Chair Billy Cheek, Devin Taylor, Thomas Plock, Robert Rayner, Lee Riback

Also present: General Manager Stephen Gay and First Assistant City Attorney Marcella Lunn

Absent: Susan Parker, Aaron Newquist

REGULAR MEETING

1. PRESENTATIONS FROM MEMBERS OF THE PUBLIC

There were no presentations from the public.

2. CONSENT AGENDA

The Consent Agenda consisted of Item 2 A.

Board Member Riback moved to recommend adoption of agenda items 2 A. Motion seconded by Board Member Taylor; motion carried.
YES (5): Chair Billy Cheek, Devin Taylor, Thomas Plock, Robert Rayner, Lee Riback
NO (0):

A. PUB25-200 Consider recommending adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the approval of Change Order No. 10 to the Design-Build Agreement between the City of Denton and Beta Engineering, LLC, for the design and construction of the Hickory Gas Insulated Substation for Denton Municipal Electric; providing for the expenditure of funds therefor; and providing an effective date (RFQ 7670 - Change Order No. 10 in the not-to-exceed amount of $1,008,314.26, for a total contract award aggregated to $44,446,058.31).

3. ITEMS FOR INDIVIDUAL CONSIDERATION

A. PUB25-202 Consider approval of the October 13, 2025, minutes.

Board Member Plock moved to recommend adoption of agenda items 3 A. Motion seconded by Board Member Taylor; motion carried.
YES (5): Chair Billy Cheek, Devin Taylor, Thomas Plock, Robert Rayner, Lee Riback
NO (0):

B. PUB25-201 Consider recommending adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute a

contract with Exceleron Software, LLC., for a prepaid utilities solution for the Customer Service Department, which is the sole provider of this software, in accordance with Texas Local Government Code 252.022, which provides that procurement of commodities and services that are available from one source are exempt from competitive bidding, and if over $50,000, shall be awarded by the governing body; providing for the expenditure of funds therefor; and providing an effective date (File 8923 - awarded to Exceleron Software, LLC., through September 30, 2038, in the not-to-exceed amount of $15,460,605.23).

Christa Foster gave a presentation and answered questions from board members. Tony Puente also answered questions from board members.

Board Member Rayner moved to recommend adoption of agenda items 3 B. Motion seconded by Board Member Plock; motion carried.
YES (5): Chair Billy Cheek, Devin Taylor, Thomas Plock, Robert Rayner, Lee Riback
NO (0):

C. PUB25-187 Management Reports

1. Integrated Utility Payment Solutions Memo
2. FM 1515 Utilities Relocation Memo
3. Bond Rates Memo
4. Future Agenda Items
5. New Business Action Items

4. CONCLUDING ITEMS

With no further business, the meeting was adjourned at 9:28 AM.

BILLY CHEEK	**CASSIE BLACKBURN**
CHAIR	**ADMIN MANAGER**
CITY OF DENTON, TEXAS	**CITY OF DENTON, TEXAS**

Minutes approved on: 11/17/2025

City of Denton

Public Utilities Board

The Public Utilities Board of the City of Denton, Texas was noticed to convene in a meeting on Monday, November 17, 2025, at 9:00 AM in the City Council Work Session Room. The following attendance was recorded:

PRESENT: *Devin Taylor, Robert Rayner, Lee Riback,*

ABSENT: *Chair Billy Cheek, Thomas Plock, Susan Parker, Aaron Newquist*

Attendees waited until 9:10 a.m. for a quorum of members to arrive.

A quorum failed to materialize, no action was taken, and the meeting was adjourned at 9:10 a.m.

_____	_____
BILLY CHEEK	CASSIE BLACKBURN
CHAIR	ADMINISTRATIVE MANAGER

MINUTES APPROVED ON: December 15, 2025

City of Denton

City Hall
215 E. McKinney Street
Denton, Texas
www.cityofdenton.com

AGENDA INFORMATION SHEET

DEPARTMENT: Denton Municipal Electric

DCM: Cassey Ogden

DATE: December 15, 2025

BACKGROUND

Consistent with Ordinance 25-1688, approved by City Council on October 14, 2025, DME has assessed the adequacy of the current Energy Cost Adjustment (ECA) rate of $.0462/kWh. Through that analysis, staff determined that the current Energy Cost Adjustment (ECA) rate of $0.0462/kWh remains adequate to maintain the system ECA account balance within the target range of +/- $20 million over the next 12 months. In addition, the ECA LL rate will remain $0.0577/kWh. The ECA LL account balance buffer will continue to be maintained between $0 and $20 million, based on a 60-day forecast of purchase power costs

The current Transmission Cost Recovery Factor (TCRF) of $0.0176/kWh will be sufficient throughout the next quarter.

RECOMMENDATION

The DME General Manager and Finance Department recommend maintaining the current rates for the Energy Cost Adjustment, Energy Cost Adjustment for Large Loads, and the Transmission Cost Recovery Factor.

EXHIBITS

Exhibit 1: Agenda Information Sheet
Exhibit 2: Presentation

Respectfully submitted:
Antonio Puente, Jr.
DME General Manager

Prepared By:
Melissa Cuevas
Division Manager of Business Services

4th Quarter Review: Energy Cost Adjustment and Transmission Cost Recovery Factors

Denton Municipal Electric

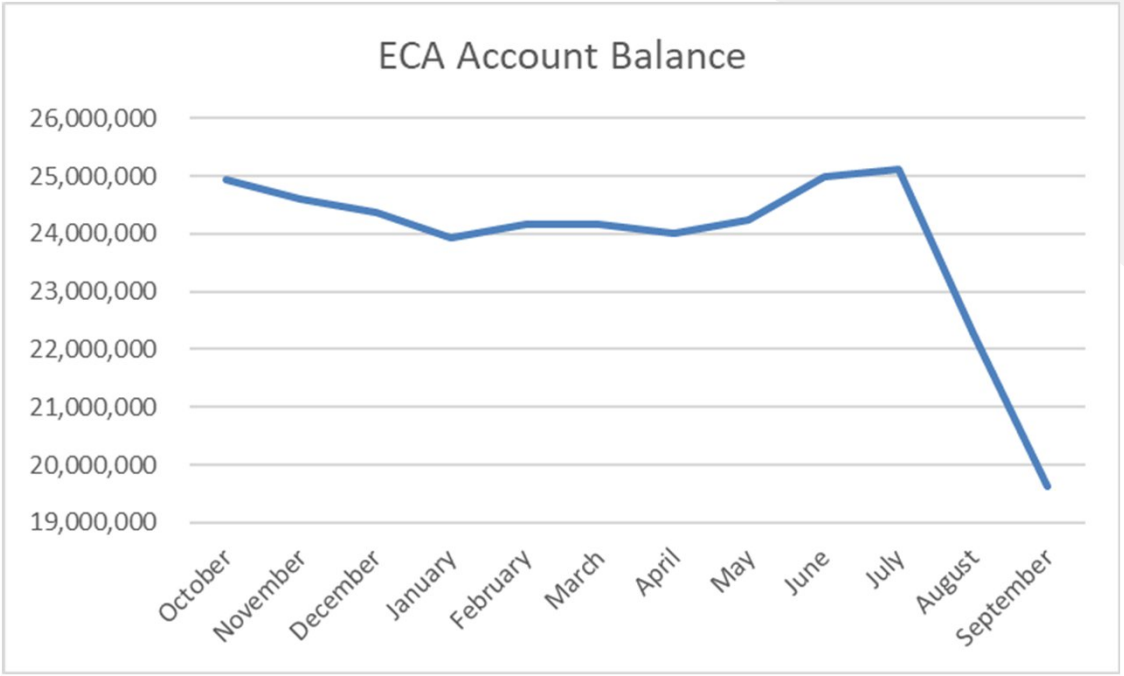
Melissa Cuevas
PUB 25-222, December 15, 2025

Current Rates

- Energy Cost Adjustment (No Changes Recommended)
  - $0.0462/kWh
  - Provides a buffer +/- $20,000,000 ECA Balance
- Large Load Energy Cost Adjustment (No Changes Recommended)
  - $0.0577/kWh
  - Provides a buffer $20,000,000 ECA Balance
- Transmission Cost Recovery Factor (No Changes Recommended)
  - $0.0176/kWh
  - $5.02/kW
  - $6.95/kVA

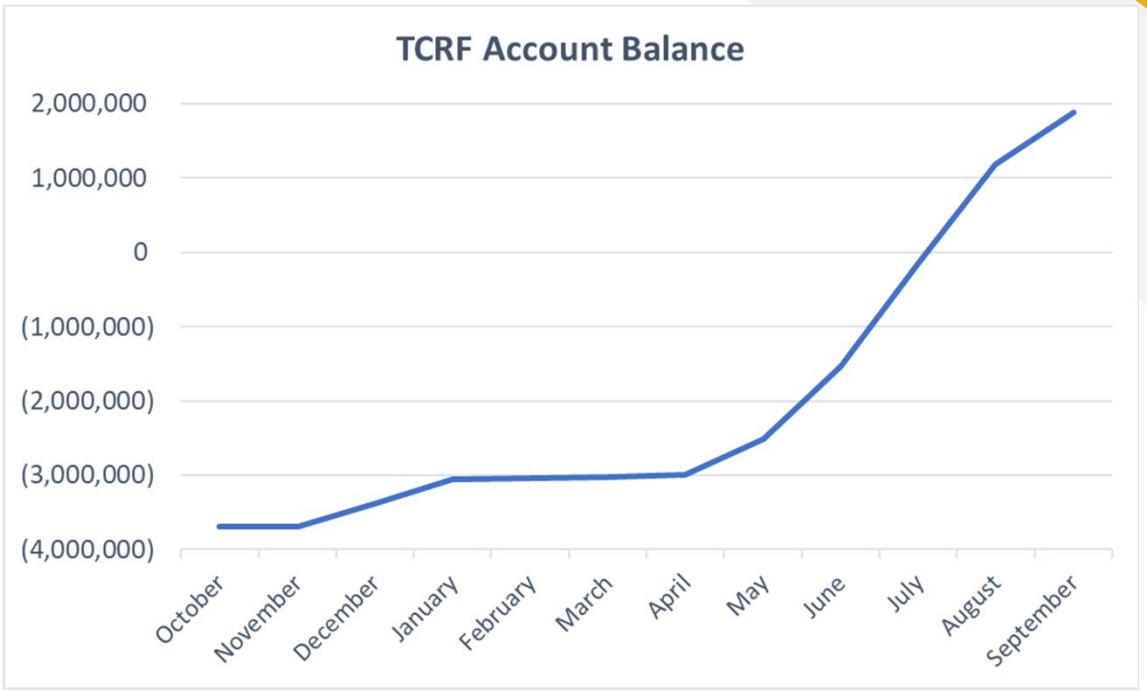
ECA Forecasted Account Balance

ECA Account Balance Forecast		
Month	Year	Maintain Rate
		$ 0.0462
October	2025	24,947,905
November	2025	24,595,271
December	2025	24,378,391
January	2026	23,922,516
February	2026	24,165,376
March	2026	24,159,559
April	2026	24,003,371
May	2026	24,238,939
June	2026	24,987,733
July	2026	25,122,446
August	2026	22,286,850
September	2026	$ 19,624,350



TCRF Forecasted Account Balance

TCRF Account Balance Forecast		
Month	Year	Maintain Rate
		$ 0.0176
October	2025	(3,693,929)
November	2025	(3,692,116)
December	2025	(3,380,523)
January	2026	(3,059,219)
February	2026	(3,040,810)
March	2026	(3,025,271)
April	2026	(2,988,839)
May	2026	(2,515,954)
June	2026	(1,536,413)
July	2026	(144,880)
August	2026	1,179,796
September	2026	$ 1,884,962



Recommendation

DME General Manager and Finance Department recommendation (Effective January 1, 2026)

- ECA
  - No requested changes for next quarter
- Large Load ECA
  - No requested changes for next quarter
- TCRF
  - No requested changes for next quarter

Questions?

City of Denton

City Hall
215 E. McKinney Street
Denton, Texas
www.cityofdenton.com

AGENDA INFORMATION SHEET

DEPARTMENT: Procurement

ACM: Christine Taylor

DATE: December 15, 2025

SUBJECT

Consider recommending adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute a contract with Integrated Power Co., for transmission line construction and maintenance for Capital Improvement Plan projects for Denton Municipal Electric; providing for the expenditure of funds therefor; and providing an effective date (CSP 8776 – awarded to Integrated Power Co., in the not-to-exceed amount of $67,990,000.00).

STRATEGIC ALIGNMENT

This action supports Key Focus Area: Enhance Infrastructure and Mobility.

INFORMATION/BACKGROUND

The Denton Municipal Electric (DME) Capital Improvement Plan (CIP) contains twenty 138kV and 345kV transmission line projects to be constructed within the next five (5) years, which will require the services of an overhead transmission line contractor. The identified projects have a range of scopes, including building new transmission lines, intercepting and extending transmission lines into new and existing substations, reconstructing existing transmission lines, and rerouting existing transmission lines for future Texas Department of Transportation (TxDOT) Interstate 35 and Loop 288 projects. A Competitive Sealed Proposal (CSP) was assembled with unit costs for all possible materials and services for the work required for all the planned CIP projects. Construction services will primarily be for the assembly and placement of steel transmission poles, installing pole foundations, stringing of conductors, and removing existing facilities where required. Transmission line construction will always have a certain amount of uniqueness, and the exact requirements for all the projects will not be known until the actual designs are complete.

In addition, a yearly retainer has been added for emergency services to repair transmission line failures. Transmission lines are vulnerable to damage from unpredictable natural storm events, such as tornadoes, electrical storms, and icy winter weather. DME does not have the manpower or equipment to handle catastrophic events that may affect the transmission system. The CSP also includes provisions for hourly rates. This provides DME the flexibility to address unforeseen construction issues as they arise, including emergency maintenance and restoration of any damaged transmission facilities. The list below includes, but is not limited to, the expected future projects. This contract will also cover any future projects as needed.

	Project	Estimated Construction Cost
Year 1	Underwood Substation Tie-in	$350,000.00
	UW Road - DW to FW TML	350,000.00
	UW Road - DW to UW TML	350,000.00
	Emergency Retainer	198,000.00
	Year 1 Total	**$1,248,000.00**
Year 2	Hickory to RD Wells TM Line	$2,300,000.00
	West Loop 288 - DW to FW TML	1,800,000.00
	West Loop 288 - MB to DN TML	1,900,000.00
	West Loop 288 - RDW to DW TML	1,800,000.00
	Emergency Retainer	198,000.00
	Year 2 Total	**$7,998,000.00**
Year 3	East Loop 288 - AR to DN TML	$2,100,000.00
	East Loop 288 - CC to KR TML	1,200,000.00
	East Loop 288 - KR to DN TML	3,600,000.00
	345kV Line Modification for New Switch	1,300,000.00
	345kV Line Modification for INT #2	1,300,000.00
	138kV TML - INT #2 to MB	8,900,000.00
	Emergency Retainer	198,000.00
	Year 3 Total	**$18,598,000.00**
Year 4	Cooper Creek to Brinker TML	$1,200,000.00
	Woodrow to Brinker TML	850,000.00
	Woodrow to Locust TML	4,300,000.00
	345kV TML - Switch to INT #1	26,300,000.00
	138kV TML - INT #1 to AR	3,500,000.00
	Emergency Retainer	198,000.00
	Year 4 Total	**$36,348,000.00**
Year 5	Southwest Substation Tie-in	$500,000.00
	Spencer Int to Pockrus TML	3,100,000.00
	Emergency Retainer	198,000.00
	Year 5 Total	**$3,798,000.00**
	Contract Estimate Total	**$67,990,000.00**

Competitive Sealed Proposals were sent to 993 prospective suppliers, including 36 Denton firms. In addition, specifications were placed on the Procurement website for prospective suppliers to download and advertised in the local newspaper. Three (3) proposals were received, references were checked, and proposals were evaluated based upon published criteria, including price, safety, schedule, and quality and reputation. Best and Final Offers (BAFO) were requested from the top firm. Based upon this evaluation, Integrated Power Co. was ranked the highest and determined to be the best value for the City.

NIGP Code Used for Solicitation:	285, 287, 553, 578, 691
Notifications sent for Solicitation sent in IonWave:	993
Number of Suppliers that viewed Solicitation in IonWave:	17
HUB-Historically Underutilized Business Invitations sent out:	103
SBE-Small Business Enterprise Invitations sent out:	390
Responses from Solicitation:	3

RECOMMENDATION

Award a contract with Integrated Power Co., for transmission line construction and maintenance for Capital Improvement Plan projects for Denton Municipal Electric, in a not-to-exceed amount of $67,990,000.

PRINCIPAL PLACE OF BUSINESS

Integrated Power Co.
North Platte, NE

ESTIMATED SCHEDULE OF PROJECT

Work will be authorized based on project schedules.

FISCAL INFORMATION

The costs for materials and services purchased under the proposed agreement will be funded out of amounts budgeted for specific CIP projects. The majority of the work proposed will be in the transmission category. Therefore, these costs for transmission projects will ultimately be recovered through the Public Utility Commission of Texas, Transmission Cost of Service Program (TCOS). The budgeted amount of this item is $67,990,000. The City will only pay for services rendered and is not obligated to pay the full contract amount unless needed.

EXHIBITS

Exhibit 1: Agenda Information Sheet
Exhibit 2: Pricing Evaluation
Exhibit 3: Presentation
Exhibit 3: Ordinance and Contract

Respectfully submitted:
Lori Hewell, 940-349-7100
Purchasing Manager

For information concerning this acquisition, contact: Mark Zimmerer, 940-349-7169.

Legal point of contact: Marcella Lunn at 940-349-8333.

Exhibit 2

CSP 8776 - Pricing Evaluation for Transmission Line Maintenance and Construction

	Respondent's Business Name:	**Integrated Power Co.**	Pike Electric, LLC	Aecon Utilities US Ltd.
	Principal Place of Business (City and State):	**North Platte, NE**	Mount Airy, NC	Wilmington, DE
1	Total Proposal Amount	**$33,562,927.99**	$55,989,818.37	$36,426,476.38

Evaluation				
Item #	**Scoring Criteria**	**Integrated Power Co.**	Pike Electric, LLC	Aecon Utilities US Ltd.
1	Quality, Reputation, and Ability to Complete Similar Projects on Schedule and Within Budget - 35%	**25.67**	32.67	18.67
2	Detailed Schedule and Written Plan - 20%	**12.00**	12.00	12.00
3	Offeror's Safety Record - 5%	**3.00**	2.00	3.00
4	Price, Total Cost of Ownership - 40%	**40.00**	23.98	36.86
	Total Score:	**80.67**	70.65	70.53

RFP 8776
Transmission Line Construction & Emergency Services

ID PUB25-228

Mark Zimmerer, P.E.

Electric Engineering Supervisor

Denton Municipal Electric

December 15, 2025

Transmission Line Construction

- Construction of Engineered Foundations
- Assembling and Erecting Steel Towers
- Hanging Assemblies and Stringing Conductor
- Emergency Services

Projects

	Project (DME)	Estimated Construction Cost	Total Project Cost
Year 1	Underwood Substation Tie-in	$ 350,000.00	$ 570,000.00
Year 1	UW Road - DW to UW TML	$ 350,000.00	$ 650,000.00
Year 1	Emergency Retainer	$ 198,000.00	-
Year 2	Hickory to RD Wells TM Line	$ 2,300,000.00	$ 5,300,000.00
Year 2	Emergency Retainer	$ 198,000.00	-
Year 3	138kV TML - INT #2 to MB	$ 8,900,000.00	$ 20,090,000.00
Year 3	Emergency Retainer	$ 198,000.00	-
Year 4	Cooper Creek to Brinker TML	$ 1,200,000.00	$ 3,550,000.00
Year 4	Woodrow to Brinker TML	$ 850,000.00	$ 1,700,000.00
Year 4	Woodrow to Locust TML	$ 4,300,000.00	$ 6,400,000.00
Year 4	345kV TML - Switch to INT #1	$ 26,300,000.00	$ 49,200,000.00
Year 4	138kV TML - INT #1 to AR	$ 3,500,000.00	$ 8,770,000.00
Year 4	Emergency Retainer	$ 198,000.00	-
Year 5	Southwest Substation Tie-in	$ 500,000.00	$ 1,300,000.00
Year 5	Emergency Retainer	$ 198,000.00	-
	Total	**$ 49,540,000.00**	**$ 97,530,000.00**

	Project (TMPA)	Estimated Construction Cost	Total Project Cost
Year 1	UW Road - DW to FW TML	$ 350,000.00	$ 650,000.00
Year 3	345kV Line Modification for New Switch	$ 1,300,000.00	$ 3,000,000.00
Year 3	345kV Line Modification for INT #2	$ 1,300,000.00	$ 3,000,000.00
Year 5	Spencer Int to Pockrus TML	$ 3,100,000.00	$ 7,290,000.00
	Total	**$ 6,050,000.00**	**$ 13,940,000.00**

	Project (TxDOT)	Estimated Construction Cost	Total Project Cost
Year 2	West Loop 288 - DW to FW TML	$ 1,800,000.00	$ 4,150,000.00
Year 2	West Loop 288 - MB to DN TML	$ 1,900,000.00	$ 4,300,000.00
Year 2	West Loop 288 - RDW to DW TML	$ 1,800,000.00	$ 4,150,000.00
Year 3	East Loop 288 - AR to DN TML	$ 2,100,000.00	$ 4,400,000.00
Year 3	East Loop 288 - CC to KR TML	$ 1,200,000.00	$ 1,600,000.00
Year 3	East Loop 288 - KR to DN TML	$ 3,600,000.00	$ 8,300,000.00
	Total	**$ 12,400,000.00**	**$ 26,900,000.00**

Year 1 Total	$ 1,248,000.00
Year 2 Total	$ 7,998,000.00
Year 3 Total	$ 18,598,000.00
Year 4 Total	$ 36,348,000.00
Year 5 Total	$ 3,798,000.00
Contract Estimate Total	**$ 67,990,000.00**

Request for Proposals:

RFP 8776 was advertised to construct transmission lines for DME.

DME has structured designs into standard units. Each standard unit has a cost which may consist of several pieces of material.

Three proposals were received.

Evaluation was based on Safety, Quality & Reputation, Schedule, and price. Integrated Power Company was ranked the highest.

Results:

RFP 8776 - Pricing Evaluation for Transmission Line Construction & Maintenance					
Contractor	**Safety**	**Quality**	**Schedule**	**Price**	**Total**
Integrated Power Company	3	25.67	12	40	**80.67**
Pike Electric West, LLC	2	32.67	12	23.98	**70.65**
Aecon Utilities US LTD	3	18.67	12	36.86	**70.53**

Recommendation

- Based on the results of RFP 8776, Integrated Power Company received the highest evaluated score and had the lowest overall price.
- Staff recommends approval of an agreement with Integrated Power Company for transmission line construction services in an amount not to exceed $67,990,000.*

* DME is not obligated to spend any amount under this contact. The majority of this total will be funded out of amounts budgeted for specific approved CIP projects will ultimately be recovered through the Public Utility Commission (PUC) Transmission Cost of Service (TCOS) Program. TXDOT projects will be funded from the State of Texas.

Questions?

ORDINANCE NO. _____

AN ORDINANCE OF THE CITY OF DENTON, A TEXAS HOME-RULE MUNICIPAL CORPORATION, AUTHORIZING THE CITY MANAGER TO EXECUTE A CONTRACT WITH INTEGRATED POWER CO., FOR TRANSMISSION LINE CONSTRUCTION AND MAINTENANCE FOR CAPITAL IMPROVEMENT PLAN PROJECTS FOR DENTON MUNICIPAL ELECTRIC; PROVIDING FOR THE EXPENDITURE OF FUNDS THEREFOR; AND PROVIDING AN EFFECTIVE DATE (CSP 8776 – AWARDED TO INTEGRATED POWER CO., IN THE NOT-TO-EXCEED AMOUNT OF $67,990,000.00).

WHEREAS, the City has solicited, received, and evaluated competitive proposals for transmission line construction and maintenance for Capital Improvement Plan projects for Denton Municipal Electric; and

WHEREAS, the City Manager, or a designated employee, has received, reviewed, and recommended that the herein described proposals are the most advantageous to the City considering the relative importance of price and the other evaluation factors included in the competitive sealed proposals; and

WHEREAS, this procurement was undertaken as part of the City's governmental function; and

WHEREAS, the City Council has provided in the City Budget for the appropriation of funds to be used for the purchase of the materials, equipment, supplies, or services approved and accepted herein; NOW, THEREFORE,

THE COUNCIL OF THE CITY OF DENTON HEREBY ORDAINS:

SECTION 1. The items in the following numbered competitive sealed proposal for materials, equipment, supplies, or services shown in the "Competitive Sealed Proposals" on file in the office of the Purchasing Agent, are hereby accepted and approved as being the most advantageous to the City considering the relative importance of price and the other evaluation factors included in the competitive sealed proposal.

CSP NUMBER	CONTRACTOR	AMOUNT
8776	Integrated Power Co.	$67,990,000.00

SECTION 2. That by the acceptance and approval of the above numbered items of the submitted proposals, the City accepts the offer of the persons submitting the proposals for such items and agrees to purchase the materials, equipment, supplies, or services in accordance with the terms, specifications, standards, quantities, and for the specified sums contained in the Proposal Invitations, Proposals, and related documents.

SECTION 3. That should the City and person submitting approved and accepted items wish to enter into a formal written agreement as a result of the acceptance, approval, and awarding of the proposals, the City Manager, or their designated representative, is hereby authorized to execute the written contract which shall be attached hereto; provided that the written contract is in accordance with the terms, conditions, specifications, standards, quantities, and specified sums contained in the Proposal and related documents herein approved and accepted.

SECTION 4. The City Council of the City of Denton hereby expressly delegates the authority to take any actions that may be required or permitted to be performed by the City of Denton under this ordinance to the City Manager of the City of Denton, or their designee.

SECTION 5. By the acceptance and approval of the above enumerated bids, the City Council hereby authorizes the expenditure of funds therefor in the amount and in accordance with the approved bids.

SECTION 6. This ordinance shall become effective immediately upon its passage and approval.

The motion to approve this ordinance was made by _____ and seconded by _____. This ordinance was passed and approved by the following vote [___ - ___]:

	Aye	**Nay**	**Abstain**	**Absent**
Mayor Gerard Hudspeth:	_____	_____	_____	_____
Vicki Byrd, District 1:	_____	_____	_____	_____
Brian Beck, District 2:	_____	_____	_____	_____
Suzi Rumohr, District 3:	_____	_____	_____	_____
Joe Holland, District 4:	_____	_____	_____	_____
Brandon Chase McGee, At Large Place 5:	_____	_____	_____	_____
Jill Jester, At Large Place 6:	_____	_____	_____	_____

PASSED AND APPROVED this the _____ day of _____, 2025.

_____
GERARD HUDSPETH, MAYOR

ATTEST:
INGRID REX, CITY SECRETARY

BY: _____

APPROVED AS TO LEGAL FORM:
MACK REINWAND, CITY ATTORNEY

BY: Leah Bush

Docusign Envelope ID: 45D94101-DFDA-4D99-8A65-B405DB143A78

Docusign City Council Transmittal Coversheet

FILE	8776
File Name	TRANSMISSION LINE MAINTENANCE AND CONSTRUCTION
Purchasing Contact	Crystal Westbrook
City Council Target Date	
Piggy Back Option	Not Applicable
Contract Expiration	
Ordinance	

DS

Docusign Envelope ID: 45D94101-DFDA-4D99-8A65-B405DB143A78

STIPULATED SUM VERTICAL CONSTRUCTION CONTRACT

BY AND BETWEEN

CITY OF DENTON

AND

INTEGRATED POWER CO.

Docusign Envelope ID: 45D94101-DFDA-4D99-8A65-B405DB143A78

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4 CONTRACT SUM
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8 MISCELLANEOUS PROVISIONS
9 ENUMERATION OF CONTRACT DOCUMENTS

EXHIBIT A GENERAL CONDITIONS
EXHIBIT B DRAWINGS AND SPECIFICATIONS; ON FILE WITH THE PURCHASING AGENT
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Docusign Envelope ID: 45D94101-DFDA-4D99-8A65-B405DB143A78

STIPULATED SUM VERTICAL CONSTRUCTION CONTRACT

This Stipulated Sum Vertical Construction Contract (this "Agreement") made as of the ____ day of _____ in the year 20____ (the "Effective Date") between City of Denton, a Texas home rule municipal corporation located at 215 East McKinney Street Denton, Texas 76201 (the "Owner" or "City") and INTEGRATED POWER CO. at 2100 E 14th Street, North Platte, NE 69101 (the "Contractor") for the following Project:

CSP #8776 - TRANSMISSION LINE MAINTENANCE AND CONSTRUCTION

The Owner and Contractor agree as follows:

Article 1. THE CONTRACT DOCUMENTS

Section 1.1 The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in the above table of contents, documents issued as part of the solicitation for the Project, this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9. In the event any provision contained in this Agreement conflicts with any provision contained in the Contract Documents, the more stringent provision for the Contractor, as interpreted by the Owner, shall govern.

Section 1.2 If, and to the extent of, any inconsistency, ambiguity, discrepancy or error in the Contract Documents (referred to collectively in this Section 1.2 as discrepancy), the Contractor shall immediately seek clarification from the Owner. In the event that the fails to clarify such discrepancy, within a reasonable time under the circumstances, the Contractor shall proceed with the Work without the clarification based on written permission from the Owner, and give precedence to the Contract Documents in the following descending order of priority:

a. Modifications issued after execution of the Owner-Contractor Agreement, including all exhibits not specifically referenced in this Section 1.2;
b. the Owner-Contractor Agreement;
c. Addenda issued prior to the execution of the Owner-Contractor Agreement, with the Addenda bearing the latest date taking precedence;
d. the General Conditions of the Contract for Construction;
e. Exhibit "B" - Drawings and Specifications;

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Article 2. THE WORK OF THIS CONTRACT

Section 2.1 The Contractor shall in a good workmanlike manner, fully execute the Work described in, and reasonably inferable by the Contractor as necessary to provide the results intended by fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others: and the Contractor at its sole cost, risk, and expense shall construct, equip, provide purchase, pay for, and furnish all of the Work in accordance with such Contract Documents. and governmental codes and regulations as they apply to performance of the Work.

Section 2.2 An Index of Drawings and Specifications which have been furnished to the Contractor as of the date of this Agreement is set forth in Exhibit “B” – Drawings and Specifications.

Section 2.3 The Contractor shall not be entitled to any adjustments in the Contract Sum or the Contract Time as a result of any action, or failure to act, in connection with any work or other services performed by the Contractor, or any entity affiliated with the Contractor, for portions of the Project other than the Work, such as, without limitation, other projects for this Owner or nearby the Project site, whether such work or other services are performed under contract with the Owner or an independent third party.

Section 2.4 The Contractor shall proceed with performance of the Work as required by the Contract Documents and shall not modify such requirements unless such modifications are accepted by the Owner in a Change Order or Construction Change Directive. The Contractor shall not be entitled to receive any additional fees as a result of any modification requests or recommendations submitted by the Contractor.

Section 2.5 The Contractor shall furnish only skilled and properly trained staff for the performance of the Work. The key members of the Contractor's staff shall be persons agreed upon with the Owner and Contractor and identified in Exhibit "C" – Key Personnel, which is attached hereto and incorporated herein for all purposes.

a. Such key members of the Contractor's staff shall not be changed without the written consent of the Owner and Contractor, unless such person becomes unable to perform any required duties due to death, disability or termination of employment with the Contractor. If a key member is no longer capable of performing in the capacity described in Exhibit "C" – Key Personnel, the Owner, and the Contractor shall agree on a mutually acceptable substitute.

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b. During the performance of the Work, the Contractor shall keep a competent superintendent at the Project site, who is fully authorized to act on behalf of the Contractor. Notice from the Owner or Contractor to such superintendent, in connection with defective Work, instructions for performance of the Work or any and all other issues shall be considered notice of such issues to the Contractor.

Article 3. DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

Section 3.1 The construction of the Work to be performed under this Contract shall be commenced within three (3) calendar days after receipt of a building permit and Owner's Notice to Proceed.

Issuance of a Notice to Proceed for construction of the Work is subject to Owners acceptance of the Contractor's proposed Construction Management Plan, and receipt of a building permit.

The Contractor shall notify the Owner in writing, with confirmation of receipt, not less than three (3) business days before commencing the Work on the Project site to permit timely filing of mortgages, mechanics' liens, and other security interests.

Section 3.2 The Contract Time shall be measured from the date of Notice to Proceed.

Section 3.3 Substantial Completion

a. Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall diligently prosecute the Work and shall achieve Substantial Completion of the entire Work by the calendar days specified in the individual project task order.
b. If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, shall be as specified in Section 8.6 of Exhibit A - General Conditions for the Contract for Construction.

Section 3.4 Final Completion

a. Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall diligently prosecute the Work and shall achieve final completion of the entire Work by the calendar days specified in the individual project task order.
b. If the Contractor fails to achieve final completion as provided in this Section 3.3, liquidated damages, shall be as specified in Section 8.6 of Exhibit A - General Conditions for the Contract for Construction.

Article 4. CONTRACT SUM

Docusign Envelope ID: 45D94101-DFDA-4D99-8A65-B405DB143A78

Section 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be sixty-seven million, nine hundred ninety thousand Dollars ($67,990,000.00), subject to additions and deductions as provided in the Contract Documents.

Section 4.2 Alternates

a. Alternates, if any, included in the Contract Sum:

See Exhibit "D" – Alternates - none

Section 4.3 Allowances, if any, included in the Contract Sum:

See Exhibit "E" – Allowances - none

Section 4.4 Unit prices, if any are set forth in Exhibit "F" – Unit Costs, and such unit prices are considered complete and include all materials, equipment, labor, delivery, installation, overhead, and profit; and any other costs or expenses in connection with, or incidental to, the performance of that portion of the Work to which such unit prices apply.

See Exhibit "F" – Unit Costs

Section 4.5 Liquidated damages, if any:
See Exhibit A - General Conditions for the Contract for Construction

Section 4.6 Other:

Section 4.7 By executing this Agreement and furnishing the Owner with both Exhibit "E" – Allowances and Exhibit "G" – Initial Schedule of Values, the Contractor represents and warrants that the Contract Documents, materials, and information furnished by the Contractor as of the date of this Agreement, and the ongoing discussions and meetings between the Contractor and the Owner have described the scope, construction requirements and design intent for the Work in detail sufficient to enable the Contractor to firmly establish the Contract Sum and the Contract Time. The Contractor shall not be permitted to claim any adjustment in either the Contract Sum or Contract Time prior to Notice to Proceed in connections with the completion of the Work except as described in the Contract Documents.

Article 5. PAYMENTS

Docusign Envelope ID: 45D94101-DFDA-4D99-8A65-B405DB143A78

Section 5.1 Progress Payments

a. Based upon Applications for Payment including all supporting documentation required by the Owner and submitted to the Owner by the Contractor; its review by the Owner; and Certificates for Payment issued by the Design Professional and Certificates for Payment issued by the Design Professional, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.
b. The period covered by each Application for Payment shall be one calendar month ending on the last day of the month.
c. Provided that a certifiable Application for Payment is approved by the Owner not later than the «twenty-fifth (25th) » day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the « thirtieth (30th) » day of the « following » month. If a certifiable Application for Payment is received by the Owner after the application date fixed above, payment of the amount certified shall be made by the Owner not later than « thirty » (« 30 ») calendar days after the Owner approves the Application for Payment.
d. Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor and approved in advance by the Owner in accordance with the Contract Documents and the Construction Management Plan. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work and be prepared in such form, and supported by such data to substantiate its accuracy, as the Owner may require. This schedule of values, unless objected to by the Owner shall be used as a basis for reviewing the Contractor's Applications for Payment.
e. Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.
f. In accordance with Exhibit A - General Conditions for the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:
    i. The amount of each progress payment shall first include:
        .1 That portion of the Contract Sum properly allocable to completed Work;
        .2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and
        .3 That portion of Construction Change Directives that the Owner determines, in the Owner's professional judgment, to be reasonably justified.

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ii. The amount of each progress payment shall then be reduced by:

.1 The aggregate of any amounts previously paid by the Owner;

.2 The amount, if any, for Work that remains uncorrected and for which the Contractor or Owner has previously withheld or nullified a Certificate for Payment as provided in Article 9 of Exhibit A - General Conditions for the Contract for Construction;

.3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;

.4 For Work performed or defects discovered since the last payment application, any amount for which the Owner may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of Exhibit A - General Conditions for the Contract for Construction; and

.5 Retainage withheld pursuant to Section 5.1.g.

g. Retainage

i. For each progress payment made prior to Final Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:

Five Percent (5.0%)

h. Omitted.

i. Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

j. Each Application for Payment shall, without limitation, conform with the requirements of Exhibit A - General Conditions for the Contract for Construction, as amended.

k. In taking action on the Contractor's Applications for Payment, the Owner shall be entitled to rely on the accuracy and completeness of the information furnished by the Contractor and shall not be deemed to represent that the Owner have made a detailed examination, audit or arithmetic verification of the documentation submitted in accordance with this Section 5.1.k or other supporting data; that the Owner have made exhaustive or continuous on-site inspections; or that the Owner have made examinations to ascertain how or for what purposes the Contractor has used amounts previously paid on account of the Contract. Such examinations, audits and verifications, if required by the Owner, will be performed by the Owner's auditors acting in the sole interest of the Owner.

l. Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the

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site, and even with such approval the Contractor shall follow the procedures in the Contract Documents for such payments.

m. In addition to other required items, the final Application for Payment shall be accompanied by the following, all in form and substance satisfactory to the Owner and in compliance with applicable statutes of the State of Texas all in a form acceptable to the Owner:

.1 A current sworn statement from the Contractor setting forth all Subcontractors and any material suppliers with whom the Contract has entered into subcontracts; the amount of each such subcontract; the amount requested for any Subcontractor or material supplier in the Application for Payment; and the amount to be paid to the Contractor from such final payment;

.2 A current, duly executed waiver of mechanics' and material suppliers' liens from the Contractor conditional upon establishing receipt of payment or satisfaction of the payment requested by the Contractor in the current Application for Payment;

.3 A current Subcontractor's lien waiver for the current period, conditional only on payment from the Contractor, and duly executed, acknowledged sworn statement showing all Sub-subcontractors and material suppliers with whom the Subcontractor has entered into sub-subcontracts, the amount of each such sub-subcontract, the amount requested for any Sub-subcontractor and material supplier in the requested progress payment, and the amount to be paid to the Sub-subcontractor from such final payment to the Subcontractor;

.4 A current, duly executed unconditional final waiver of mechanics' and material suppliers' liens from the Contractor and all Subcontractors and, when deemed appropriate by the Owner from material suppliers and Sub-subcontractors establishing payment or satisfaction of payments of all amounts requested by the Contractor on behalf of such entities or persons in any previous Applications for Payment;

.5 A final certificate of occupancy issued by the appropriate governmental body in which the project is located;

.6 All maintenance and operating manuals;

.7 Digitally marked, fully accessible electronic files (not "plot files" or "PDFs") of both field record drawings and specifications reflecting "as-built" conditions;

.8 Digitally marked, accurately dimensioned, and fully accessible electronic files (not "plot files" or "PDFs") of drawings reflecting the location of any concealed utilities, mechanical or electrical systems, and components;

.9 any special guarantees or warranties required by the Contract Documents;

.10 assignments of all guarantees and warranties from subcontractors, vendors, suppliers, or manufacturers;

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.11 a list of the primary contact names, email addresses, physical addresses, and telephone numbers of all Subcontractors and any other persons providing guarantees and warranties;

.12 all information and materials required to comply with the requirements of the Contract Documents or reasonably requested by the Owner; and

.13 If required by the Owner's title insurer, if any, the Contractor shall execute a personal gap undertaking in form and substance satisfactory to such title insurer.

Section 5.2 Final Payment

a. Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

.1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of Exhibit A - General Conditions for the Contract for Construction, and to satisfy other requirements, if any, which necessarily survive beyond final payment; and

.2 a final Certificate for Payment has been issued by the Owner; and.

.3 the Contractor has provided, and the Owner has accepted as correct, all the information and documents required under Section 5.1.m above; and

.4 a complete release of all claims arising out of, related to or connected with Contractor's performance of the respective Phase under this Agreement, and any claims of Subcontractors, subject to any claims reserved in accordance with the terms of the General Conditions and an affidavit that so far as Contractor has knowledge or information, the release includes and covers all materials and services over which Contractor has control for which a claim could be filed, subject to any claims reserved in accordance with the terms of the General Conditions.

b. The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the final Certificate for Payment and the Contractor has provided Owner with all required documentation.

Section 5.3 Interest

Payments are due and payable within thirty (30) days of the date the Owner receives the Construction Manager's approvable invoice, unless a different date for payment is provided under this Agreement. Amounts unpaid shall bear interest at the legal rate allowed by Texas Government Code Ch. 2251.

Article 6. DISPUTE RESOLUTION

Section 6.1 Initial Decision Maker

The Owner will serve as the Initial Decision Maker pursuant to Article 15 of Exhibit A - General Conditions for the Contract for Construction.

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Section 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation or other alternative dispute resolution method as mutually agreed by the parties ("ADR") pursuant to Article 15 of Exhibit A - General Conditions for the Contract for Construction, the method of binding dispute resolution shall be litigation in a court of competent jurisdiction.

Article 7. TERMINATION OR SUSPENSION

Section 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of Exhibit A - General Conditions for the Contract for Construction, as amended.

If the Contract is terminated for the Owner's convenience in accordance with Article 14 of Exhibit A - General Conditions for the Contract for Construction, then the Owner shall pay the Contractor a compensation calculated in the manner as specified in Section 14.4.c of Exhibit A - General Conditions for the Contract for Construction, as amended.

Section 7.2 The Work may be suspended by the Owner as provided in Article 14 of Exhibit A - General Conditions for the Contract for Construction, as amended.

Section 7.3 In the event of such termination by the Owner, the amount to be paid to the Contractor shall not exceed the amount the Contractor would have been entitled to receive under Article 5 above.

Section 7.4 In no event shall the Contractor be entitled to receive "Lost Opportunity Costs", defined as unabsorbed overhead costs or unrealized profit on this Work, future work for this Owner, other owner(s), other work, foregone opportunities for the Contractor, or other costs not directly and verifiably associated with services actually performed or Work successfully completed under this Agreement.

Article 8. MISCELLANEOUS PROVISIONS

Section 8.1 All references in this Agreement to Exhibit A, shall mean the Exhibit A - General Conditions for the Contract for Construction, as modified and amended by the parties hereto. Where reference is made in this Agreement to a provision of another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

Section 8.2 The Owner's representative:
Mark Zimmerer
City of Denton
1689 Spencer Rd

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Denton, TX 76205
mark.zimmerer@cityofdenton.com

Section 8.3 The Contractor's representative:
Kathryn Hisel
INTEGRATED POWER CO.
2100 E 14th Street
North Platte, NE 69101
khisel@ip-co.net

Section 8.4 Neither the Owner's nor the Contractor's representative shall be changed without ten days' prior notice to the other party.

Section 8.5 Insurance and Bonds

a. The Owner and the Contractor shall purchase and maintain insurance as set forth in Exhibit A - General Conditions for the Contract for Construction, Insurance and Bonds, and elsewhere in the Contract Documents.

Section 8.6 « Not Used. »

Section 8.7 Other Conditions and Services:

a. The Contractor represents and warrants the following to the Owner (in addition to any other representation and warranties contained in the Contract Documents) as a material inducement to the Owner to execute this Agreement, which representations and warranties shall survive the execution and delivery of this Agreement, any termination of this Agreement, and final completion of the Work:

.1 The Contractor is financially solvent, capable of obtaining adequate insurance, able to pay all debts as they mature and possessed of sufficient working capital to complete the Work and perform all obligations hereunder;

.2 The Contractor is able to furnish the physical infrastructure, tools, materials, supplies, equipment and supervision, and labor required to complete the Work and perform its obligations hereunder and has sufficient experience and competence to do so;

.3 The Contractor is authorized to do business in the City of Denton, and the State of Texas and is properly licensed by all necessary governmental and public and quasi-public authorities having jurisdiction over the Contractor and over the Work and the Project;

.4 The Contractor's execution of this Agreement and performance thereof is within the Contractor's duly-authorized powers;

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.5 The Contractor's duly-authorized representative has visited the site of the Project and is familiar with the local conditions under which the Work is to be performed and has correlated its observations with the requirements of the Contract Documents;

.6 The Contractor possesses a high level of experience and expertise in the business administration, construction, construction management and superintendence of projects of this size, complexity and nature of this particular Project and will perform the Work with the care, skill and diligence of such a contractor;

.7 The foregoing warranties are in addition to, and not in lieu of, any and all other liability imposed upon the Contactor by law with respect to the Contractor's duties, obligations, and performance hereunder; and

.8 The Contractor acknowledges that the Owner is relying upon the Contractor's skill and experience in connection with the proper, timely and diligent prosecution of the Work.

b. In the event any provision contained in this Agreement conflicts with any provision contained in the Contract Documents, the more stringent provision for the Contractor, as interpreted by the Owner, shall govern.
c. Some or all of the Owner's duties, approvals and actions required under this Agreement may be provided by third parties by mutual agreement of the Owner and such third parties. When notified in writing of the specific duties and responsibilities of such third party, the Contractor will recognize the actions and approvals of the third party as sufficient to fulfill the Owner's responsibilities under this Agreement.
d. The Contractor shall provide sufficient supporting documentation in form and with a level of detail wholly acceptable to the Owner and Contractor to substantiate any Application for Payment, request for Change to the Contract Sum or Contract Time, and all contract Allowances provided within the Contractor's Contract Sum for this scope of work. Failure to timely provide all supporting documentation, in and of itself, may result in rejection of the Application for Payment or requested change to the Contract Sum or Contract Time, or payment for work charged to the Allowance(s).
e. Proof of purchase and warehouse insurance naming the Owner and Contractor as additional insureds, together with inspection rights for the Owner and Contractor is to be provided for any billed materials by the Contractor for the work not physically stored at the Project site.
f. Time limits set out in or under this Agreement are solely for the protection and benefit of the Owner and create no third-party beneficiary rights in any other party.
g. Notices. All legal notices, consents, approvals, demands, requests or other communications provided for or permitted to be given under any of the provisions of this Agreement shall be in writing and shall be deemed to have been duly given or served

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when delivered by hand delivery or when deposited in the U.S. mail by registered or certified mail, return receipt requested, postage prepaid, and addressed as follows:

If to Owner:
Mark Zimmerer
City of Denton
1689 Spencer Rd
Denton, TX 76205
mark.zimmerer@cityofdenton.com

City of Denton
ATTN: Contract *8776*; Purchasing Manager
901B Texas Street
Denton, Texas 76209
purchasing@cityofdenton.com

And with a copy to City Attorney's point of contact:

City Attorney
City of Denton
215 East McKinney St.
Denton, TX 76201
legal@cityofdenton.com

If to Contractor:

INTEGRATED POWER CO.
2100 E 14th Street
North Platte, NE 69101

h. All Exhibits referred to in this Agreement are, by reference, incorporated herein for all purposes.
i. The numbering and captions of the sections are set forth only for convenience and reference and are not intended in any way to define, limit, or describe the scope or intent of this Agreement.

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j. The parties agree that they will execute any further instrument or instruments, and that they will perform any act or acts, which are or may become necessary to effectuate any of the terms or provisions of this Agreement.

k. Nothing contained in this Agreement shall create a contractual relationship with a cause of action in favor of a third party against either the Owner or Contractor.

l. This Agreement has been created jointly and ambiguity cannot be construed against either party.

m. This Agreement is and shall be subject to those provisions required of political subdivisions by the laws of the State of Texas. The Contractor understands that the Owner is a Texas home rule municipality and that the project is subject to applicable provisions of Texas law including bid requirements, bonding, and final settlement provisions.

n. Contractor understands that certain information, including this Agreement, are public records available for public inspection and copying under the Texas Open Records Act., Texas Government Code Ch. 552, as amended, and other applicable laws.

o. The Owner represents that there are sufficient funds available to undertake this Project.

p. No term or condition of the Agreement shall be construed or interpreted as a waiver, express or implied, of any of the governmental or sovereign immunities, rights, benefits, or protections of the Owner.

q. Contractor warrants that the products, processes, techniques and methodologies provided by Contractor shall not infringe upon the copyright, patent or other proprietary rights of others.

r. Contractor certifies and warrants that no gratuities, kickbacks or contingency fees were paid in connection with this Agreement, nor were any fees, commissions, gifts or other considerations made contingent upon the award of this Agreement. Contractor warrants that to the best of Contractor's knowledge, there exists no actual or potential conflict of interest, and no financial or substantial interest as may be prohibited by Texas law, the Charter, or Code of Ethics of the City of Denton between Contractor and Owner.

s. Contractor shall comply with the disclosure and reporting requirements in Local Government Code Chapters 171 and 176, and Texas Government Code Sec. 2252.908. Under Sec. 2252.908, if City Council approval is required to award this Agreement or if this Agreement has a value of at least $1,000,000, the City may not enter into the Agreement unless the Contractor submits a disclosure of interested parties to the City at the time the executed Agreement is presented to the City. The disclosure must be made on the form prescribed by the Texas Ethics Commission and the City is required to submit a copy of the disclosure statement to the Texas Ethics Commission not later than the 30th day after the disclosure is received by the City.

t. In case any provision hereof shall, for any reason, be held invalid or unenforceable in any respect, such invalidity or unenforceability shall not affect any other provision hereof,

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and this Contract shall be construed as if such invalid or unenforceable provision had not been included herein.

u. Contractor understands and agrees that TIME IS OF THE ESSENCE.

v. This Agreement may be executed by the parties hereto in separate counterparts, each of which when so executed and delivered shall be an original, but all such counterparts shall together constitute one and the same instrument. Each counterpart may consist of any number of copies hereof each signed by less than all, but together signed by all of the parties hereto. Any documents submitted to the City in electronic format shall be considered equivalent to an original of such document.

w. Any of the representations, warranties, covenants, and obligations of the Parties, as well as any rights and benefits of the Parties, pertaining to a period of time following the termination of this Agreement shall survive termination.

x. COMPLIANCE WITH CERTAIN STATE LAW

.1 Prohibition on Contracts with Companies Boycotting Israel. Contractor acknowledges that in accordance with Chapter 2271 of the Texas Government Code, City is prohibited from entering into a contract with a company for goods or services unless the contract contains a written verification from the company that it: (1) does not boycott Israel; and (2) will not boycott Israel during the term of the contract. The terms "boycott Israel" and "company" shall have the meanings ascribed to those terms in Section 808.001 of the Texas Government Code. By signing this agreement, Contractor certifies that Contractor's signature provides written verification to the City that Contractor: (1) does not boycott Israel; and (2) will not boycott Israel during the term of the agreement. Failure to meet or maintain the requirements under this provision will be considered a material breach.

.2 Prohibition on Contracts with Companies Boycotting Certain Energy Companies. Contractor acknowledges that in accordance with Chapter 2274 of the Texas Government Code, City is prohibited from entering into a contract with a company for goods or services unless the contract contains written verification from the company that it (1) does not boycott energy companies; and (2) will not boycott energy companies during the term of the contract. The terms "boycott energy company" and "company" shall have the meanings ascribed to those terms in Section 809.001 of the Texas Government Code. By signing this agreement, Contractor certifies that Contractor's signature provides written verification to the City that Contractor: (1) does not boycott energy companies; and (2) will not boycott energy companies during the term of the agreement. Failure to meet or maintain the requirements under this provision will be considered a material breach.

.3 Prohibition on Contracts with Companies Boycotting Certain Firearm Entities and Firearm Trade Associations. Contractor acknowledges that in

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accordance with Chapter 2274 of the Texas Government Code, City is prohibited from entering into a contract with a company for goods or services unless the contract contains written verification from the company that it (1) does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association; and (2) will not discriminate during the term of the contract against a firearm entity or firearm trade association. The terms "discriminate against a firearm entity or firearm trade association," "firearm entity" and "firearm trade association" shall have the meanings ascribed to those terms in Chapter 2274 of the Texas Government Code. By signing this agreement, Contractor certifies that Contractor's signature provides written verification to the City that Contractor: (1) does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association; and (2) will not discriminate during the term of the contract against a firearm entity or firearm trade association. Failure to meet or maintain the requirements under this provision will be considered a material breach.

.4 Prohibition on Contracts with Companies Doing Business with Iran, Sudan, or a Foreign Terrorist Organization. Sections 2252 and 2270 of the Texas Government Code restricts CITY from contracting with companies that do business with Iran, Sudan, or a foreign terrorist organization. By signing this agreement, Contractor certifies that Contractor's signature provides written verification to the City that Contractor, pursuant to Chapters 2252 and 2270, is not ineligible to enter into this agreement and will not become ineligible to receive payments under this agreement by doing business with Iran, Sudan, or a foreign terrorist organization. Failure to meet or maintain the requirements under this provision will be considered a material breach.

.5 Termination Right for Contracts with Companies Doing Business with Certain Foreign-Owned Companies. The City of Denton may terminate this Contract immediately without any further liability if the City of Denton determines, in its sole judgment, that this Contract meets the requirements under Chapter 2274, and Contractor is, or will be in the future, (i) owned by or the majority of stock or other ownership interest of the company is held or controlled by individuals who are citizens of China, Iran, North Korea, Russia, or other designated country (ii) directly controlled by the Government of China, Iran, North Korea, Russia, or other designated country, or (iii) is headquartered in China, Iran, North Korea, Russia, or other designated country.

.6 Pursuant to Chapter 2258, Texas Government Code, all contractors and any Subcontractor involved in the construction of a public work project shall pay not less than the prevailing rates as per diem wages in the locality at the time of construction to all laborers, workmen and mechanics employed by them in the execution of this contract. Contractor shall assure that these requirements are met

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for the Project and shall insure that every contract or subcontract relating to the Work requires, on behalf of Owner, that the prevailing wage rates be paid.

.7 The Contractor shall be provided an applicable Department of Labor Wage Rate Determination for use on the Project required by Chapter 2258.022, Texas Government Code. In the event the Owner does not provide this Labor Wage Rate Determination, the Contractor shall request it in writing in a timely manner, so as not to delay the Construction Manager's initial subcontractor procurement process during preconstruction. The Construction Manager shall, if requested by the Owner, assist the Owner in conducting a survey of the wages paid, by labor class, on projects of a similar type in a similar location.

Article 9. ENUMERATION OF CONTRACT DOCUMENTS

Section 9.1 This Agreement is comprised of the following documents:

.1 Stipulated Sum Vertical Construction Contract

.2 Exhibit "A" – General Conditions of the Contract for Construction

.3 Exhibit "B" – Drawings and Specifications (On File with Purchasing Manager)

.4 Addenda, if any:

See Exhibit "B" – Drawings and Specifications (On File with Purchasing Manager)

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

.5 Other Exhibits:

Exhibit "C" – Key Personnel
Exhibit "D" – Alternates – *None*
Exhibit "E" – Allowances – *None*
Exhibit "F" – Unit Costs
Exhibit "G" – Initial Schedule of Values– *None*
Exhibit "H" – Contractor's Construction Schedule
Exhibit "I" – Escrow Agreement– *None*
Exhibit "J" – Conflict of Interest Questionnaire
Exhibit "K" – Proposal Form
Exhibit "L" – Prevailing Wage Rates
Exhibit "M" – Contractor's Insurance Certificate(s) and Bonds (To be Completed after Contract Award)

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.6 Other documents, if any, listed below:
(List here any additional documents that are intended to form part of the Contract Documents. Exhibit A provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

« »

This Agreement entered into as of the day and year first written above.

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CONTRACTOR:

BY: Signed by: Kathryn Hisel 78E1520DE3D64D6...

Name: Kathryn Hisel

Title: Owner

Phone Number: 308-430-2982 Email Address: khisel@ip-co.net

PO Box 1743, North Platte, NE 69103

TEXAS ETHICS COMMISSION CERTIFICATE NUMBER

2025- 1386324

CITY:
CITY OF DENTON, TEXAS

BY: _____

SARA HENSLEY
CITY MANAGER

ATTEST:

_____ CITY SECRETARY

BY: _____

APPROVED AS TO LEGAL FORM:

MACK REINWAND, CITY ATTORNEY

BY: DocuSigned by: Marcella Lunn 4B070831B4AA438...

THIS AGREEMENT HAS BEEN

BOTH REVIEWED AND APPROVED

as to financial and operational obligations and business terms.

Signed by: Antonio Puente, Jr. E3760944C2BF4B5...

SIGNATURE PRINTED NAME Antonio Puente, Jr.

DME General Manager

TITLE

Electric

DEPARTMENT

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Section 00 72 00
Exhibit A – General Conditions
for the following PROJECT:
8776 – Transmission Line Construction and Maintenance

THE OWNER:

City of Denton
215 East McKinney Street
Denton, Texas 76201

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Article 1. GENERAL PROVISIONS

Section 1.1 Basic Definitions

a. The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Proposal Documents, Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Design Professional. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

b. The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Design Professional or the Design Professional's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Design Professional or the Design Professional's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Design Professional shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Design Professional's duties. This Agreement was the result of negotiations between the Owner and Contractor, and has been reviewed by the Owner, Contractor and their respective counsel. Accordingly, this Agreement shall be deemed to be the product of both parties and no ambiguity shall be construed in favor of or against either party. The terms "Agreement" and "Contract" shall be used interchangeably to have the same meaning as defined in this Section 1.1.b.

c. The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, supplies, skill, supervision, transportation, support services, facilities and other resources necessary or proper or incidental to the carrying out and completion of the terms of the contract and all other items of cost or value needed to produce, construct and fully complete the Work identified by the Contract Documents. The Work may constitute the whole or a part of the Project.

d. The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

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e. The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

f. The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

g. Design Documents

Design Documents are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Design Professional and the Design Professional's consultants under their respective professional services agreements. Design Documents may include, without limitation, studies, surveys, models, sketches, drawings, specifications, the Project Manual and other similar materials.

h. Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions.

i. The Indemnitees

The Owner, which includes the Mayor, members of the City Council, employees, agents, assigns, and other city officers, the Owner's consultants, the Design Professional, Design Professional's consultants, and the agents and employees of any of them shall hereafter be known as the "Indemnitees".

j. Construction Management Plan

The Construction Management Plan is prepared by the Contractor for its use in managing the Work and is not a Contract Document. The Construction Management Plan must include, at a minimum and without limitation, the following separate deliverables, which are subject to review and approval by the Design Professional and Owner:

i. Safety and Logistics Plan;
ii. Contractor's Construction Schedule;
iii. Cost Management Plan, Control Estimate and Schedule of Values;
iv. Quality Management, Commissioning and Turnover Plan; and
v. Information Management System.

k. As-Built Documents

The As-Built Documents are the Drawings, Specifications, and addenda thereto that may be updated by the Contractor to accurately reflect the actual Work in place, including without limitation, the incorporation of Change Orders, responses to the Contractor's requests for information, Design Professional's supplemental instructions, field modifications, and other similar changes made to the Work during construction. The As-Built documents shall conform to the format and compatibility requirements of Section 3.10.1.i.

l. Work Breakdown Structure

The project's Work Breakdown Structure ("WBS") is a deliverable-oriented, hierarchical organization of the Project components to be executed by the Owner, and its accompanying numbering system. The WBS will be mutually agreed upon by the Owner and Design Professional and used by the Contractor.

m. Equal to (or Approved Equal)

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Products by manufacturers and information about those products other than those products specified in the Contract Documents which the Contractor may submit for substitution as equal to those products specified in the Contract Documents; which may be incorporated in the Work after using the process specified in the Contract Documents for review and acceptance by the Design Professional and acceptance of same by the Owner.

n. Underground Facilities

All underground lines, pipelines, conduits, ducts, encasements, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or systems at the Site, including but not limited to those facilities or systems that produce, transmit, distribute, or convey telephone or other communications, cable television, fiber optic transmissions, power, electricity, light, heat, gases, oil, crude oil products, liquid petroleum products, water, steam, waste, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

o. Force Majeure

An act of God, fire, tornado, hurricane, flood, earthquake, explosion, war on American soil, civil disturbance, labor strikes, and similar unavoidable circumstances beyond Contractor's control, not caused by the negligent act or omission of Contractor or breach of this Agreement, its Subcontractors, or anyone else for whom Contractor is responsible, and not caused by Contractor's breach of a project labor or a "no strike" agreement.

p. Knowledge

The terms "knowledge," "recognize" and "discover," their respective derivatives and similar terms in the Contract Documents, as used in reference to the Contractor, shall be interpreted to mean that which the Contractor knows or should know, recognizes or should recognize and discovers or should discover in exercising the care, skill, and diligence of a diligent and prudent contractor familiar with the Work. Analogously, the expression "reasonably inferable" and similar terms in the Contract Documents shall be interpreted to mean reasonably inferable by a diligent and prudent contractor familiar with the Work and in accordance with the highest standards in the construction profession.

q. Proposal

The offer or proposal of an Offeror submitted on the prescribed form setting forth the prices for the Work to be performed.

r. Offeror

The individual or entity that submits a Proposal directly to City.

s. Proposal Documents

The Proposal Requirements and the proposed Contract Documents including all addenda.

t. Proposal Requirements

The Advertisement or Request for Proposal, Invitation to Offerors, Instructions to Offerors, Offeror's Bond or other Proposal security, the Proposal Form, and the Proposal with any attachments.

u. Notice of Award

A written notice given by City to the Successful Offeror stating that upon timely compliance by the Successful Offeror with the conditions precedent listed in such notice, City will sign and deliver the Agreement.

v. Calendar Day

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A day consisting of 24 hours measures from midnight to the next midnight. A “day” or “Day” unless otherwise defined shall mean a Calendar Day.

w. Business Day

A day that the City conducts normal business, generally Monday through Friday, except for federal or state holidays observed by the City.

x. Notice to Proceed

A written instrument from the Owner to the Contractor requiring the Contractor to proceed with performance of activities, including, but not limited to development of submittals, ordering of materials, and any other services (the “Preconstruction Services”) required to prepare for and expedite the construction of the Work as required by the Contract Documents; and complete the Work (the “Construction Services”).

Section 1.2 Correlation and Intent of the Contract Documents

a. The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results. Where a conflict occurs between or within standards, specifications, and drawings, the more stringent or higher quality requirements shall apply. The precedence and coordination of the Contract Documents are as follows:

.1 Any addenda and modifications to the Drawings and Specifications take precedence over any earlier Contract Documents.

.2 Should there be a conflict within the Specifications, or within the Drawings, or between the Drawings and Specification, the Design Professional shall decide which stipulation will provide the best installation and its decision shall be final.

.3 The Drawing and Specifications are intended to coordinate with each other. Anything shown on the Drawings but not mentioned in the Specification or vice-versa, or anything not expressly set forth in either, but which is reasonably implied, shall be furnished as though specifically shown and mentioned in both without any extra charge.

.4 The Drawings, for purposes of clearness and legibility, are essentially diagrammatic, and although the sizes and locations of equipment are shown to scale wherever possible, the Contractor, Subcontractors, and Sub-subcontractors are required to familiarize themselves with all the Work required by the Contract Documents. Each Contractor, Subcontractor, and Sub-subcontractor shall properly coordinate its work with that of the Owner and all Separate Contractors. It is not within the scope of the Drawings to show all necessary offsets, obstructions or structural conditions. It shall be the responsibility of each Contractor to plan, coordinate, and install its work in such a manner so as to conform to the structure. Any conflict within the Drawings shall be referred to the Design Professional for disposition prior to the installation of any affected work.

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.5 Figured dimensions contained in the Contract Documents shall be accurately followed, even though they differ from scaled measurements. No work shown on the plans, the dimensions of which are not figured, shall be executed until instructions have been obtained from the Design Professional as to the dimensions to be used. Larger scale Drawings shall have preference over smaller scale drawings, but discrepancies shall be referred to the Design Professional for interpretation.

.6 Underground Facilities

Shown or Indicated: The information and data shown or indicated in the Contract Documents with respect to Underground Facilities at or contiguous to the Site is based on information and data furnished to City or Engineer by the owners of such Underground Facilities, including City, or by others, unless it is otherwise expressly provided in the Supplementary Conditions:

City and Engineer shall not be responsible for the accuracy or completeness of any such information or data provided by others; and

the cost of all of the following are included in the Contract Price, and Contractor shall have full responsibility for:

reviewing and checking all information and data;

verifying the actual location of those Underground Facilities shown or indicated in the Contract Documents as being within the area affected by the Work, by exposing such Underground Facilities during the course of construction;

coordination and adjustment of the Work with the owners (including City) of such Underground Facilities, during construction; and

the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.

Not Shown or Indicated: If an Underground Facility that is uncovered or revealed at the Site was not shown or indicated on the Drawings or otherwise indicated in the Contract Documents, or was not shown or indicated on the Drawings or in the Contract Documents with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith, identify the owner of such Underground Facility and give notice to that owner and to City. Contractor shall be responsible for the safety and protection of such discovered Underground Facility.

If City concludes that a change in the Contract Documents is required, a Change Order may be issued to reflect and document such consequences, subject to the provisions of Article 7.

Verification of existing utilities, structures, and service lines shall include notification of all utility companies a minimum of 48 hours in advance of construction including exploratory excavation if necessary.

.7 Reliance by Contractor on Technical Data:

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Contractor is provided certain technical data with respect to such reports and drawings for its use, but the City does not warrant or guarantee the accuracy of the information, and such information including reports and drawings are not Contract Documents. Contractor may not make any Contract Claim against City, or any of its officers, elected or appointed officials, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

the completeness or accuracy of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or

other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

the contents of other Site-related documents made available to Contractor, such as record drawings from other projects at or adjacent to the Site, or City's archival documents concerning the Site; or

any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

i. The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

b. Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

c. Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

Section 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents that are a part of this Contract.

Section 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

Section 1.5 Ownership and Use of Design Documents

a. Submittal or distribution of the Design Documents or any portion thereof to meet official laws, statutes, ordinances and regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Owner's reserved rights.

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b. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers are authorized to use and reproduce the Design Documents provided to them solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Design Documents. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers may not use the Design Documents on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner.

Section 1.6 Notice

a. Except as otherwise provided in Section 1.6.b, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement. In the event notice is provided by mail, it shall be sent certified return receipt requested.
b. Notice of Claims as provided in Section 15.1.c shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

Section 1.7 Digital Data Use and Transmission

a. The parties shall agree upon protocols governing the transmission and use of Design Documents or any other information or documentation in digital form. The parties will establish the protocols for the development, use, transmission, and exchange of digital data in writing, as mutually agreed.
b. The Contractor, at any time upon the request of the Owner, shall immediately return and surrender to the Owner, without limitation, all electronic and hard copies of any Project-related materials, records, notices, memoranda, recordings, drawings, specifications, mock-ups and any other documents furnished by the Owner or the Design Professional to the Contractor.

Section 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without written agreement to protocols governing the use of, and reliance on, the information contained in the model, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

Section 1.9 The representations and warranties contained in the Contract Documents shall survive the complete performance of the Work or earlier termination of this Agreement.

Article 2. OWNER

Section 2.1 General

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a. The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.a, the Design Professional does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

b. The Owner shall furnish the following information to a person, including the Design Professional or Contractor, who makes a request for information under Texas Government Code Chapter 2253, related to a payment or performance bond: (1) a certified copy of a payment bond and any attachment to the bond; (2) the public work contract for which the bond was given; and (3) the toll-free telephone number maintained by the Texas Department of Insurance under Subchapter B, Chapter 521, Insurance Code, for obtaining information concerning licensed insurance companies.

c. The Owner may obtain independent review(s) of the Design Professional's Design Documents, or of any document or other materials submitted by the Contractor, by a separate architect, engineer, contractor, cost estimator or any other consultant they deem necessary and put under contract to or cause to be employed by the Owner. Such independent review shall be undertaken at the Owner's expense in a timely manner and shall not delay the orderly progress of the Work. The Design Professional and Contractor shall cooperate with such Owner's other consultants fully and respond to their reviews and comments in writing in a timely and comprehensive manner. This provision shall not be interpreted to require the Owner to obtain an independent review or imply that the Owner is in any way assuming responsibility for the work of the Design Professional and Contractor.

Section 2.2 Evidence of the Owner's Financial Arrangements

a. Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract.

b. Following commencement of the Work and within ten (10) business days of written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.b, the Contract Time shall be extended appropriately, and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

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c. After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.
d. Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information. Notwithstanding the above, all Agreements with the Owner shall have all references to compensation redacted before disclosing to Subcontractors, sub-Subcontractors, or any other tier of vendor.

Section 2.3 Information and Services Required of the Owner

a. Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.a, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.
b. The Owner shall retain a Design Professional lawfully licensed to practice architecture or engineering as applicable, or an entity lawfully practicing architecture or engineering, as applicable, in the jurisdiction where the Project is located. That person or entity is identified as the Design Professional in the Agreement and is referred to throughout the Contract Documents as if singular in number.
c. If the employment of the Design Professional terminates, the Owner shall employ a successor whose status under the Contract Documents shall be that of the Design Professional.
d. The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.
e. The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.
f. Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.b.
g. The foregoing are, without limitation and in addition to, the other duties and responsibilities of the Owner specified in Article 6; Article 9; and Article 11.

Section 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or fails to carry out Work in accordance with the

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Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.c nor shall the exercise of the Owner's right hereunder give rise to any claim by Contractor for additions to the Contract Sum or Contract Time.

Section 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within forty-eight (48) hours from receipt of written notice from the Owner or Design Professional to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. The Design Professional may, at the direction of the Owner, pursuant to Section 9.5.a, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Design Professional's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Design Professional, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

Section 2.6 Extent of Owner Rights

a. The rights stated in this Article 2 and elsewhere in the Contract Documents are cumulative and not in limitation of any rights of the Owner granted in the Contract Documents; at law; or in equity.
b. In no event shall the Owner or Design Professional have control over, charge of, or any responsibility for construction means, methods, techniques, sequences, or procedures or for safety precautions and programs in connection with the Work. Notwithstanding anything else herein, and without limitation, any review(s), independent or otherwise, or approval(s) by the Owner or Design Professional of the Design Documents, the Contract Documents, the Contractor's Construction Management Plan(s), the Contractor's Construction Schedule, shop drawings, submittals, meeting minutes or other Contractor's services, deliverables or activities; nor the exercising of any of the rights and authority granted the Owner or Design Professional in the Contract Documents shall in any way reduce, diminish, or otherwise affect the Contractor's responsibilities, duties and accountability to the Owner for, without limitation, the construction means, methods, techniques, sequences, procedures or for safety precautions, and the provision of the Work per the requirements of the Contract Documents.
c. The Owner reserves the right to have the Contractor and/or subcontractors remove person(s) and/or personnel from any and all work on the Project for cause but without cost to the Owner. Such requests from the Owner will be made in writing and may be done directly or indirectly through the Design Professional/Engineer or on-site representative. "Cause" may include, but is not limited to, any of the following: incompetence, poor workmanship, poor scheduling abilities, poor coordination, disruptive to the project, the facility or others, poor management, cause delay or delays, will not strictly adhere to facility procedures and project requirements either willfully

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or unknowingly, insubordination, drug/alcohol use, possession of contraband, belligerent acts or actions, etc. The Contractor shall provide replacement person(s) and/or personnel acceptable to the Owner at no cost to the Owner.

Article 3. CONTRACTOR

Section 3.1 General

a. The Contractor is the person or entity identified as such in the Contract or Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located, Denton County, Texas. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.
b. The Contractor shall perform the Work in accordance with the Contract Documents.
c. The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Design Professional in the Design Professional's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

Section 3.2 Review of Contract Documents and Field Conditions by Contractor

a. Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents. Prior to execution of the Agreement, the Contractor and each Subcontractor have evaluated and satisfied themselves as to the conditions and limitations under which the Work is to be performed, including, without limitation, (i) the location, condition, layout, and nature of the Project site and surrounding areas and generally prevailing climatic conditions; (ii) anticipated labor supply and costs; (iii) availability and cost of materials, tools, and equipment; and (iv) other similar issues. The Owner and Design Professional assume no responsibility or liability for the physical condition or safety of the Project site, or any improvements located on the Project site. Except as set forth in Section 10.3, the Contractor shall be solely responsible for providing a safe place for the performance of the Work. The Owner and Design Professional shall not be required to make any adjustment in either the Contract Sum or the Contract Time in connection with any failure by the Contractor or any Subcontractor to have complied with the requirements of this Section 3.2.a.
b. Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.d, shall take field measurements of and verify any existing conditions related to that portion of the Work, and shall observe and verify the impact of any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Design Professional any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for

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information in such form as the Design Professional may require. If the Contractor performs any construction activity knowing it involves a recognized error, inconsistency or omission in the Contract Documents without such notice to the Design Professional, the Contractor shall assume appropriate responsibility for such performance and shall bear an appropriate amount of the attributable costs for correction per Section 12.2. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

c. The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Design Professional any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Design Professional may require.
d. If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Design Professional issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.b or 3.2.c, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.b or 3.2.c, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.g, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Design Professional for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities unless such error, inconsistency or omission could be ascertained from a careful study of the Contract Documents in its capacity as a contractor and not as a design professional.

Section 3.3 Supervision and Construction Procedures

a. The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work in accordance with the Contract Documents.
b. The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.
c. The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.
d. The Contractor shall carefully check its own work and that of Subcontractors as the Work is being performed.
e. During the finishing stages of the project, the Contractor shall make frequent inspections of the Work, with the applicable Subcontractor(s) involved, if any, with seven (7) days advance notice to the Design Professional, and the Contractor shall identify incorrect and faulty Work.
f. The Contractor shall ensure that incorrect or faulty Work is corrected immediately.
g. The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Design Professional in their

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administration of the Contract, or by tests, inspections or approvals required or performed by persons other than the Contractor.

Section 3.4 Labor and Materials

a. Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

b. The Contractor is encouraged to consider products and systems that improve the project and retain the character of the products specified, but do not alter the intent of the project. However, except in the case of minor changes in the Work authorized by the Design Professional in accordance with Sections 3.12.h or 7.4, the Contractor may make substitutions only by a formal request for substitution of products in place of those specified with the consent of the Owner, after evaluation by the Design Professional in accordance with the conditions set forth below and elsewhere in the Contract Documents, and a Change Order or Construction Change Directive. The Contractor must submit to the Design Professional and the Owner, for each proposed substitution:

.1 A full explanation of the proposed substitution and submittal of all supporting data, including technical information, catalog “cut sheets”, warranties, test results, installation instructions, operating procedures, and other like information necessary for a complete evaluation of the substitution;

.2 A written explanation of the reasons the substitution is advantageous and necessary, including the benefits to the Owner and the Work in the event the substitution is acceptable;

.3 The adjustment, if any, in the Contract Sum, in the event the substitution is acceptable;

.4 The adjustment, if any, in the time of completion of the Contract and the Contractor’s Construction Schedule in the event the substitution is acceptable;

.5 An affidavit stating that (1) the proposed substitution conforms to and meets all the requirements of the pertinent Specifications and the requirements shown on the Drawings, and (2) the Contractor accepts the warranty and correction obligations in connection with the proposed substitution as if originally specified by the Design Professional;

.6 Proposals for substitutions shall be submitted electronically to the Design Professional and the Owner’s other consultants, if any, in sufficient time to allow no less than ten (10) business days for their respective reviews;

.7 No substitutions will be considered or allowed without the Contractor's submittal of complete substantiating data and information as stated herein; and

.8 Substitutions and alternates may be rejected without explanation and will be considered only under one or more of the following conditions: (1) the proposal is required for compliance with interpretation of code requirements or insurance regulations then existing; (2) specified products are unavailable through no fault of the Contractor; (3) subsequent information discloses the

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inability of specified products to perform properly or to fit in the designated space; (4) the manufacturer/fabricator refuses to certify or guarantee the performance of the specified product as required; and (5) when, in the judgment of the Owner or the Design Professional, a substitution would be substantially in the Owner's best interests, in terms of cost, time, or other considerations; and

.9 Whether or not any proposed substitution is accepted by the Owner, the Owner's other consultants, if any (if any), or the Design Professional, the Contractor shall reimburse the Owner for any fees charged by the Design Professional, and the Owner's other consultants for evaluating each proposed substitute.

c. The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them. Smoking and chewing of tobacco products is prohibited in enclosed new construction. No glass bottles shall be brought on the construction site or Owner's property by any construction personnel.
d. All work under this Agreement shall be performed in a skillful and workmanlike manner in accordance with the highest industry standards.
e. The Contractor shall only employ or use labor in connection with the Work capable of working harmoniously with all trades, crafts, and any other individuals associated with the Project. The Contractor shall also use best efforts to minimize the likelihood of any strike, work stoppage, or other labor disturbance.

.1 If the Work is to be performed by trade unions, the Contractor shall make all necessary arrangements to reconcile, without delay, damage, or cost to the Owner and without recourse to the Design Professional or the Owner, any conflict between the Contract Documents and any agreements or regulations of any kind at any time in force among members or councils that regulate or distinguish the activities that shall not be included in the work of any particular trade; and

.2 In case the progress of the Work is affected by any undue delay in furnishing or installing any items or materials or equipment required under the Contract Documents because of such conflict involving any such labor agreement or regulation, the Owner may require that other material or equipment of equal kind and quality be provided pursuant to a Change Order or Construction Change Directive.

Section 3.5 Warranty

a. The Contractor warrants to the Owner and Design Professional that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform with the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal

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wear and tear and normal usage. If required by the Design Professional, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. **THE CONTRACTOR SHALL DEFEND AND HOLD THE OWNER HARMLESS AGAINST ANY CLAIM, DEMAND, LOSS, OR DAMAGE BY ANY BREACH OF THIS WARRANTY, AND CONTRACTOR ACKNOWLEDGES IT SHALL NOT LIMIT SUCH WARRANTY BY THE PROVISIONS OF SECTION 12.2.**

b. All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner and shall commence in accordance with Section 9.8.d.

c. When written warranties are specified, the document shall include the following information:
Name and address of Project and Owner;
Article, materials, or systems covered;
Name and address of Installer;
Name and address of Contractor; and
Signature of individual authorized to sign contracts for the company issuing the warranty.

d. The following minimum warranty terms shall be incorporated:

.1 Duration shall be one year or as otherwise specified, dated from the Date of Substantial Completion;

.2 The article, material or system is free from defective materials and workmanship;

.3 Costs of repair or replacement shall not accrue to the Owner, including, without limitation, repair or replacement of other work disturbed by, or because of, repair or replacement; and

.4 The warranty period of two years, or as otherwise specified, shall recommence upon the identification and completion by Contractor and acceptance by Owner of any warranty claim during the initial two-year (2) warranty period.

e. Warranties which are provided by a manufacturer for its product shall be received by the Contractor, filled out and filed with the manufacturer or other appropriate entity in coordination with the Owner. Certificates or registration stubs shall be included with the record documents submitted for the Owner upon completion of the Work. The Owner shall administrate manufacturer's warranties/guarantees after expiration of the Contractor's warranty.

f. Temporary or trial usage by the Owner of any mechanical device, machinery, apparatus, equipment, or any work or material supplied under the Contract Documents before final completion and written acceptance by the Design Professional and Owner shall not be construed as evidence of the Design Professional's or the Owner's acceptance of same, or the commencement of any warranty periods.

g. The Owner has the privilege of such temporary or trial usage, for such reasonable time as the Owner, or the Design Professional deem proper. The Contractor shall make no claims for damage or injury to, or breaking of, any parts of such work which may be caused by weakness or insufficiency of structural parts, or by defective materials or workmanship.

h. The Contractor may, without cost to the Owner, make such trial usage. However, trials shall only be conducted with the Design Professional's prior approval and under its observation as may be required by either of them. Equipment and/or materials shall be replaced or returned to "as new" condition prior to acceptance by the Owner.

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i. The Contractor agrees to assign to the Owner at the time of final completion of the Work any and all manufacturer's warranties relating to materials and labor used in the Work and further agrees to perform the Work in such manner so as to preserve any and all such manufacturer's warranties.

j. If necessary as a matter of law, the Contractor may retain the right to enforce directly any such manufacturers' warranties during the one (1) year period following the date of Substantial Completion described in Section 12.2.b.

Section 3.6 Taxes

The Contractor shall, to the extent not exempted under Section 13.11.i herein, pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect. In no event shall the Owner pay the Contractor for taxes that were not properly due or for which the Owner is exempt from paying under Texas law.

Section 3.7 Permits, Fees, Notices and Compliance with Laws

a. Unless otherwise provided in the Contract Documents, the Owner shall secure and pay for the building permit. The Owner shall also pay for any applicable gas, water, sewer and electrical service application fees; assessments against the property, including property tax, developmental excise and similar taxes; sewer, water, and related utility tap fees; and sewer plant improvement fees, unless exempted under Texas law. The Contractor shall secure and pay for all other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

b. The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

c. If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, regardless of whether such work is in accordance with Contract Documents, and without notice to the Design Professional that the Contract Documents are at variance with applicable laws, ordinances, rules, or regulations, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction. Codes and ordinances shall take full and complete precedence over anything contained in the Drawings, Specifications, or other Contract Documents, except where the Contract Documents call for Work or materials of higher standards than those required by codes or ordinances, in which case, the Contract Documents shall govern. Nothing contained in the Contract Documents shall be construed as authority for the Contractor to violate any applicable codes or ordinances in effect at the site.

d. Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Design Professional before conditions are disturbed and in no event later than

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seven (7) days after first observance of the conditions. The Design Professional will promptly investigate such conditions and, if, in the Design Professional's opinion, they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If, in the Design Professional's opinion, the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Design Professional shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Design Professional's recommendation, that party may submit a Claim as provided in Article 15.

i. In no event shall any adjustment in the Contract Sum or Contract Time be made for conditions which should have been known to the Contractor or would have been noticed by a Contractor of similar size and experience pursuant to its on-site inspection; by way of or conditions referenced in any other inspections or tests concerning the site which have been made available to the Contractor or have been performed by the Contractor or its Subcontractors; are part of the Contract Documents; or are part of the materials provided by the Contractor to be used in constructing the improvements.

e. If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Design Professional. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

f. The Contractor shall comply with all applicable laws, statutes, rules, codes, orders, regulations, and ordinances, including, but not limited to, all immigration, environmental and safety laws, statutes, rules, codes, orders and regulations.

.1 The Contractor shall also maintain at all times during the term of the this Agreement (and for the time otherwise required by law) all records required by the United States Citizenship and Immigration Services ("USCIS"), including, without limitation, the completion and maintenance of the Form I-9 for each of Contractor's employees and shall respond at all times during the term of this Agreement in a timely fashion to any inspection request related to such I-9 forms by the Contractor, Owner or governmental agency or authority;

.2 Furthermore, during the term of this Agreement, and for the time otherwise required by law, Contractor shall cause its officers, directors, managers, agents, and employees to cooperate fully in all respects with any audit, inquiry, inspection, or investigation that may be conducted by the USCIS of the Contractor or any of its employees or subcontractors;

.3 The Contractor shall immediately, and in any event within two (2) hours of Contractor's first notice of an event described in this Section 3.7.f notify the Owner in writing and by in-person voice communications (not voicemail) of any unscheduled inspections, raids, investigations, inquiries, visits, or audits

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conducted by the USCIS, OSHA, or any other governmental agency or authority related to environmental, immigration, or employee safety issues of the Contractor, its agents, employees, its Design Professional, Subcontractors, or Sub-subcontractors;

.4 The Contractor shall, on a monthly basis during the term of this Agreement, conduct an audit of the I-9 forms for its employees and shall promptly correct any defects or deficiencies that are identified as a result of such audit;

.5 The Owner may, at its sole discretion, terminate this Agreement immediately if, at any time during the term of this Agreement, the Contractor violates or is in breach of any provision of this Section 3.7.f or the USCIS determines that Contractor has not complied with any of the immigration laws, statutes, rules, codes, or regulations of the United States or any applicable state laws or regulations, or any applicable local ordinances, including, without limitation, the Immigration Reform and Control Act of 1986, as amended, and the Illegal Immigration Reform and Immigration Responsibility Act of 1996, as amended, and any successor statutes thereto;

.6 If an employee of the Contractor or if the Contractor is later determined to not have valid I-9 information then that employee shall be removed and barred from the Project site at the Contractor's expense; and

.7 The Contractor shall require the Subcontractors, Sub-subcontractors and material suppliers to make the representations and warranties set forth in this Section 3.7.f and to be bound by the same requirements set forth herein.

Section 3.8 Allowances

a. The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.
b. Unless otherwise provided in the Contract Documents,

.1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

.2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and

.3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.b.1 and (2) changes in Contractor's costs under Section 3.8.b.2.

c. Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

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Section 3.9 Superintendent

a. The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work including, but not limited to, weekends, evenings and nights, or as otherwise reasonably and mutually agreed in writing with the Owner, until all punch list items have been completed to the satisfaction of the Design Professional. No subcontractor shall perform work on the site without the presence of the Superintendent or Assistant Superintendent. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.
b. The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Design Professional of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Owner or the Design Professional may notify the Contractor, stating whether the Owner or the Design Professional (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Design Professional to provide notice within the 14-day period shall constitute notice of no reasonable objection.
c. All of the Contractor's proposed on-site personnel must be approved by the Design Professional and Owner. The Contractor shall not employ a proposed superintendent to whom the Owner or Design Professional has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed. Substitution or other significant personnel changes which may affect the Contractor's on-site personnel must be preceded by written notification of the Design Professional and Owner no less than seven (7) business days before the anticipated event. Such proposed changes must be approved by the Design Professional and Owner. The Contractor shall designate a second person in charge in writing in the event the Superintendent is temporarily absent due to illness, vacation, or any other cause(s).

Section 3.10 Contractor's Construction and Submittal Schedules

i. Where the Contract is based on a Stipulated Sum, the Contractor, immediately after being awarded the Work, and before execution of the Agreement, shall meet at a Preconstruction Conference with the Owner for the purpose of reviewing the Contractor's proposed Construction Management Plan; assisting the Owner with further developing the Master Project Schedule; and integrating the Work of the Contractor into that of the Owner and all Separate Contractors, if any.
ii. The Contractor's Project Schedule must include all the following:
    .1 Use precedence format, critical path method scheduling without the use of artificial activity constraints or "negative float";
    .2 Use software, techniques and methods satisfactory to the Owner;
    .3 Provide an electronic and graphic representation of all activities and events that will occur during performance of the Work;
    .4 Identify each subproject, to include, without limitation preconstruction, construction, commissioning, turnover of the Work, and Owner's occupancy;
    .5 Set forth dates that are critical in ensuring the timely and orderly completion of the Work in accordance with the requirements of the Contract Documents (hereinafter referred to as "Contractual Milestone Dates");

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.6 Upon review by the Design Professional and written review and acceptance by the Owner of the Contractual Milestone Dates, the Contractor's Project Schedule shall be deemed part of the Contract Documents and provided to the Owner as a submittal;

.7 If not accepted, the Contractor's Project Schedule shall be promptly revised by the Contractor in accordance with the recommendations of the Owner and resubmitted for acceptance;

.8 Submission of an updated Contractor's Project Schedule with each Application for Payment shall be a mandatory condition precedent to the payment by the Owner to the Contractor pursuant to an Application for Payment, and the Owner shall not be obligated to make payment if the Contractor fails to include an updated Contractor's Project Schedule reflecting the then-current conditions on the Project and the anticipated progress of Work based on those conditions; and

.9 All requests for change orders, modifications or additional compensation from the Contractor affecting the Contract Time or Contract Sum shall include a detailed schedule with both data and graphics showing the specific effect of the changed, modified or differing condition(s) on the critical path of the Contractor's Project Schedule.

iii. The Contractor, prior to preparing the Construction Management Plan and attending the Preconstruction Conference, will have reviewed the sequences, durations, sequencing and dependencies of activities, material deliveries, and sequenced man-hour staffing to complete the Work. Work activities which have an installed value of twenty thousand dollars ($20,000) or more will be broken down into major products or operations except where mutually agreed otherwise by Contractor and Owner, and these values cost-loaded into the Contractor's Project Schedule as deemed necessary by the Owner. Upon request by the Owner, the Contractor shall support values given for each work activity with data that will substantiate its correctness. The Owner may require the Contractor to show separate work activities and Contractual Milestones for, as examples only and without limitation: Substructure Completion; Superstructure Completion; Building Exterior Skin Completion; Interior Finishes Completion; Owner's Beneficial Occupancy, and other similar dates the Owner, at its sole discretion deems important to the Project.

iv. In the event the Contractor does not timely provide the Contractor's Construction Management Plan with an acceptable Contractor's Project Schedule containing such elements, information, and processes in a form and with a level of detail acceptable to the Design Professional and the Owner, the Owner may, at the Owner's discretion, unilaterally generate the target Contractor's Project Schedule at the Contractor's expense, and impose such schedule, sequences, logic, and/or durations on the Contractor as it deems necessary to complete the Work, or the Owner may declare the Contractor in breach of contract. Whether or not the Owner decides to implement this option, all other contractual provisions relating to breach of contract will continue to be in full force and apply without modification. The Owner may deduct from the Contractor's Application(s) for Payment the amount paid by the Owner for generating the Contractor's Project Schedule.

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v. Upon completion of the Master Project Schedule, and acceptance by the Owner and all Separate Contractors, the Master Project Schedule shall supersede previously submitted schedules. Each updated Master Project Schedule shall supersede previous updates.

b. The Contractor shall, at the Preconstruction Conference, and as a sub-system of its Contractor's Project Schedule, prepare an easily isolated, sorted and separately viewed submittal schedule, and thereafter update it as necessary to maintain a current submittal schedule, and shall submit such schedule(s) for the Design Professional's approval. The Design Professional's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's Construction Schedule, and (2) allow the Design Professional reasonable time to review submittals. If the Contractor fails to submit an approvable submittal schedule thirty (30) days prior to the date established for commencement of the Work, the Contractor shall not mobilize on site, or be entitled to any increase in Contract Sum or extension of Contract Time based on the delay of the Work or time required for review of submittals during the prosecution of the Work.

c. The Contractor shall perform the Work in general accordance with the most recent Contractor's Project Schedules submitted to the Owner and Design Professional and incorporated into the approved Master Project Schedule.

d. The Owner together with the Contractor, will monitor the Master Project Schedule, and incorporate the Contractor's updates to its portions of this overall schedule. As all Separate Contractors are also obligated to follow the Master Project Schedule and their respective schedules therein, they will be required to actively cooperate and participate in the preparation and updating of their portion of this schedule, as well as updating the overall Master Project Schedule by the Owner. The Contractor will be kept updated on all significant Master Project Schedule changes materially affecting the Contractor's Project Schedule.

e. The Contractor will produce a Short Interval Schedule containing activities for not less than one (1) previous week and the next three (3) weeks, and which focuses on the major weekly work activities of each subsystem. At each weekly meeting this Short Interval Schedule will be reviewed by the Contractor with all affected Subcontractors and the Owner.

f. In the event of substantial delay, if excusable under the Contract, for which extension of the Contract Time has or will be granted, the Owner will review and may require revision by the appropriate contractor(s) of affected component of the Master Project Schedule as required by the specific applicable situation(s), and with the cooperation of the Separate Contractors on the Project.

g. The Contractor shall, at mutually agreed intervals, submit to the Owner and Design Professional a progress report stating, without limitation, labor forces mobilized and working on site; areas worked in or on; percent complete of current work activities; any potential schedule or coordination problems; material deliveries received; site visitors; and other information as required by the Owner.

h. The Contractor shall monitor the progress of the Work for conformance with the requirements of the Contractor's Project Schedule and shall promptly advise the Owner of any delays or potential delays. The accepted Contractor's Project Schedule shall be updated to reflect actual conditions as frequently as mutually agreed by the Contractor and Owner; but in no event less frequently than with each Application for Payment; and at other times as may be reasonably requested by the Owner or Design Professional. In the event any progress report or schedule update indicates any

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actual or potential delays, the Contractor shall, using both the most currently approved Contractor's Project Schedule as a baseline for comparison, and a written narrative, propose an affirmative plan to correct the delay (hereinafter referred to as the "Proposed Recovery Schedule") which must include the following:

.1 The Proposed Recovery Schedule will show the results of working additional shift or days, adding additional labor, and any of the other actions specified in Section 8.4, if necessary, all as described in the accompanying narrative;

.2 The Proposed Recovery Schedule will be reviewed by the Owner, and the Contractor will promptly and diligently make all adjustments to the Proposed Recovery Schedule reasonably requested as a result of such review.

.3 The Proposed Recovery Schedule shall become the most current, approved Contractor's Project Schedule upon its approval by the Owner, issuance of a Change Order for the purpose by the Design Professional; and signing of such Change Order by the Contractor, Design Professional, and Owner, in that order; and

.4 In no event shall any progress report, schedule update or Proposed Recovery Schedule constitute an adjustment in the Contract Time, any Contractual Milestone Date, or the Contract Sum unless any such adjustment is agreed to by the Owner and authorized pursuant to Change Order.

i. In the event either the Owner or Design Professional determine that the performance of the Work, as of a Contractual Milestone Date, has not progressed or reached the level of completion required by the Contract Documents, the Owner shall have the right to order the Contractor to take corrective measures necessary to expedite the progress of construction, including, without limitation those further specified in Section 8.4.

j. The Owner may exercise the rights furnished the Owner under or pursuant to this Section 3.10 and Section 8.4 as frequently as the Owner deems necessary to ensure that the Contractor's performance of the Work will comply with any Contractual Milestone Date or completion date set forth in the Contract Documents.

k. The Owner shall have the right to direct a postponement or rescheduling of any date or time for the performance of any part of the Work that may interfere with the operation of any part of the Owner's organization or any stakeholders or invitees thereof. The Contractor shall, upon the Owner's or Design Professional's request, reschedule such portion of the Work during hours when the interference to the Owner's organization, or any stakeholders or invitees thereof, will be minimized or eliminated. Any postponement, rescheduling, or performance of the Work under this Section 3.10.k may be grounds for an extension of the Contract Time, if permitted under Section 8.3.a; and an equitable adjustment in the Contract Sum if the performance of the Work was properly scheduled by the Contractor in compliance with the requirements of the Contract Documents; and to the extent such rescheduling or postponement is required for the convenience of the Owner.

l. Documents and Samples at the Site

The Contractor shall make available, to the Owner, Design Professional or their designees, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and

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selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy and delivered to the Design Professional for submittal to the Owner upon completion of the Work as a record of the Work as constructed. The Contractor shall make available to the Owner or Design Professional for inspection and copying the record copy of the drawings, specifications, addenda, Change Orders and other Modifications, including all such documents maintained by the Contractor in electronic format, upon reasonable request of the Owner or Design Professional and, in any event, within twenty-four (24) hours of receipt by Contractor of a request from Owner or Design Professional for such review and/or copying. The Owner or Design Professional may request the record copy of the As-Built Documents, specifications, addenda, Change Orders and other modifications of the Work to be updated before Substantial Completion to reflect the most current condition of the Project, as additional Cost of the Work paid as a Change Order at the Owner's expense. The Owner or Design Professional may require the Contractor to furnish the As-Built Documents in electronic format and may make copies of them prior to completion of the Work at the Owner's expense.

i. The Contractor shall provide final electronic files and one "hard" copy of the Drawings and Specifications to the Owner updated to reflect the final condition of the Project with the final Application for Payment as a condition precedent to final payment.

Section 3.12 Shop Drawings, Product Data and Samples

a. Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.
b. Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.
c. Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.
d. Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Design Professional is subject to the limitations of Section 4.2.g. Informational submittals upon which the Design Professional is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Design Professional without action.
e. The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Design Professional, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, after Contractor has verified the information contained within said submittals is in accordance with representations required by Section 3.12.f and in accordance with the submittal schedule approved by the Design Professional or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

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f. By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Design Professional that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents and (4) verified the information contained within said submittals is in accordance with all applicable Federal, state and local codes or ordinances in effect at the site.

g. The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Design Professional. Should the Contractor, Subcontractors, or Sub-subcontractors install, construct, erect or perform any portion of the Work without approval of any requisite submittal, the Contractor shall bear the costs, responsibility, and delay for removal, replacement, and/or correction of any and all items, material, and /or labor.

h. The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Design Professional's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Design Professional of such deviation at the time of submittal and (1) the Design Professional has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Design Professional's approval thereof.

i. The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Design Professional on previous submittals. In the absence of such notice, the Design Professional's approval of a resubmission shall not apply to such revisions.

    i. Copies of all approved Shop Drawings, Product Data, Samples and similar submittals shall be preserved in an orderly manner and delivered by the Contractor to the Owner upon Final Completion.

j. The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

    i. If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor, the Owner and the Design Professional will specify all performance and design criteria that such services must satisfy in the Contract Documents. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional who shall comply with reasonable

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requirements of the Owner regarding qualifications and insurance. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Design Professional. The Owner and the Design Professional shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Design Professional have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.j, the Design Professional will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

ii. If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Owner and the Design Professional at the time and in the form specified by the Design Professional.

Section 3.13 Use of Site, Delivery and Storage

a. The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.
b. The Contractor shall coordinate the Contractor's operations with, and secure the approval of, the Owner before using any portion of the site.
c. The Contractor shall take reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury or loss to, all persons at the Project site; all property at the Project site; and all persons or property adjacent thereto, which includes, but is not limited to, the all the following duties and acknowledgments:

.1 The Contractor acknowledges the Project site comprises and/or may be adjacent to existing structures and that these site areas may be occupied during the performance of some portions of this Contract;

.2 The Work shall be performed, to the fullest extent reasonably possible, in such a manner that public areas adjacent to the site of the Work shall be free from all debris, building materials, and equipment likely to cause interference with adjacent stakeholders or create hazardous conditions;

.3 The Contractor shall be responsible for the mitigation and/or abatement of all noise, dust, fumes, traffic or other by-product of construction activity that, in the opinion of the Owner or the Design Professional, have an adverse affect on the quality of life or productivity for Project stakeholders, the Owner's current operations, or the Owner's employees. Such mitigation and/or abatement shall be performed in manner and with a result completely and wholly acceptable to the Owner and Design Professional;

.4 The Contractor shall control its personnel and the Subcontractors on site, especially regarding the use of alcohol or profanity, dressing in an inappropriate manner, parking in an inappropriate place, or other activities deemed to be inappropriate, to the satisfaction of the Owner and Design Professional. Repeat

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offenses will cause the Owner or Design Professional to require, through the Contractor, the temporary or permanent removal of the offending individuals, Subcontractor(s) or Sub-subcontractor(s) from the site;

.5 The Contractor shall, at a minimum, secure the site by erecting and maintaining a 6'-0" chain link fence around the perimeter of the construction site. This fence shall remain intact until such time the site becomes secure in the opinion of the Contractor, as a result of construction progress (by way of example, and without limitation, completion of site grading and backfill, installation of doors and windows, etc.);

.6 The Contractor shall furnish and maintain sufficient sanitary facilities for its own forces and those of any Subcontractor or Sub-subcontractor. The facilities of any existing, nearby buildings will not be available for construction use; and

.7 The Contractor is advised that the project site area is subject to, among other inclement weather, unpredictable and high winds. When all or a portion of the Work is suspended for any reason, the Contractor shall securely fasten down all coverings and stored materials on site and fully protect the Work, as necessary, from injury or damage by any cause and to prevent possible damage caused by flying materials and debris.

d. The Contractor shall ensure that the Work, at all times, is performed in a manner that affords reasonable access, both vehicular and pedestrian, to the site of the Work and all adjacent areas, which includes, but is not limited to, all of the following duties:

.1 The access to the site shall be maintained in compliance with all local, state, and Federal code and life safety requirements for ingress by first responders and other similar emergency requirements;

.2 The Contractor shall inform the Owner, Design Professional and any officials referenced in Section 3.13.f in writing a minimum of thirty (30) calendar days prior to any disruption of access, specifically and graphically showing the nature of the disruption, as well as the hours it will be disrupted. Such disruption will be subject to Owner's and Design Professional's approval, such approval not to be unreasonably withheld;

.3 The Owner shall be responsible for snow removal to the limits of the construction site only so far that the Contractor will have access to the entrance to the construction area; and

.4 Snow removal within the limits of work and/or for the purpose of performing and protecting work by individual contractors is the duty of the Contractor.

e. During the performance of the Work, the Contractor, its Subcontractors, Sub-subcontractors, suppliers and their employees agree they shall:

.1 Use such entrances to the construction site that may be designated by the Owner;

.2 Perform the Work at such times of the day and days of the week as may be designated by the Owner; and

.3 Accept that these entrances and times may be reviewed and changed from time to time by the Owner.

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f. The Contractor shall notify all public utility companies a minimum of two (2) business days prior to the commencement of any work by it or its Subcontractors in the vicinity of the utilities. No work shall commence until the utilities have been located and staked by the utility company or written consent from the Owner to proceed has been given to the Contractor. If the utility service must be interrupted, the Contractor shall, at Contractor's sole cost and expense, notify the head of the local administrative services (by way of example only, and without limitation, the city manager, the mayor, the city or county clerk, etc. as applicable) and the utility users affected by the interruption. Such notice shall consist of direct written communication, publication in a local newspaper, and/or announcement on local radio or television stations, whichever is most reasonably calculated to give the most effective notice to such utility users.

g. The Contractor shall exercise due diligence in seeing that all equipment, material, and supplies are delivered in advance of the time they are needed on the job and shall properly store and protect same at the Contractor's expense.

h. Notwithstanding any other provision herein, the Contractor shall take all necessary measures to store materials on site for which payment has been requested by the Contractor or been made by the Owner so that they shall not deteriorate, be damaged or be stolen, which includes, but is not limited to, all the following:

.1 Only materials and equipment that are to be used directly in the Work shall be brought to and stored on the Project site by the Contractor;

.2 Protection of construction materials and equipment stored at the Project site from fire, weather, burglary, pilferage, vandalism and mischief, damage, and all other adversity; and the care and protection of materials and Work installed in the building is solely the responsibility of the Contractor;

.3 The Contractor shall bear sole responsibility for the restoration of damaged Work and replacement of damaged or stolen materials at no additional cost to the Owner; and

.4 After equipment is no longer required for the Work, it shall be promptly removed from the Project site.

i. The Contractor shall not deliver any materials to the site which are not to be installed by same Contractor without fifteen (15) day's advance notice in writing to the Owner of the location, date, and time of such delivery to allow proper coordination. Such materials shall be received jointly by a representative of the Contractor and a representative of the Owner, who shall agree, and the Contractor shall document such agreement in writing:

.1 The materials delivered are undamaged, or if damaged, such damage is documented by digital photo(s);

.2 They are in the quantities shown on the purchase order, invoice or bill of lading accompanying the shipment or delivery or otherwise provided;

.3 The storage conditions are adequate for the purposes; and

.4 The Contractor has accepted responsibility for insurance and ongoing protection per Section 10.2 for such material until it is released to a third party authorized in writing by the Owner to receive it.

Section 3.14 Cutting and Patching

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a. The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.
b. The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

Section 3.15 Cleaning Up

a. The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract and shall be responsible for daily clean-up of construction materials and dust control. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project and shall clean all glass surfaces and leave the Work "broom clean", or its equivalent, except as otherwise specified.
b. If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

Section 3.16 Access to Work

The Contractor shall provide the Owner and Design Professional and their representatives with access to the Work in preparation and progress at all times wherever located, and shall provide proper and safe facilities for such access.

Section 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall defend and hold the Owner and Design Professional harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Design Professional. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Design Professional.

Section 3.18 Indemnification

a. CONTRACTOR DOES HEREBY AGREE TO WAIVE ALL CLAIMS, RELEASE, INDEMNIFY, DEFEND AND HOLD HARMLESS INDEMNITEES FROM AND AGAINST ANY AND ALL CITATIONS, CLAIMS, COSTS, DAMAGES, DEMANDS, EXPENSES, FINES, JUDGMENTS, LIABILITY, LOSSES, PENALTIES, SUITS OR CAUSES OF ACTION OF EVERY KIND INCLUDING ALL EXPENSES OF LITIGATION AND/OR SETTLEMENT, COURT COSTS AND ATTORNEY FEES

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WHICH MAY ARISE BY REASON OF INJURY TO OR DEATH OF ANY PERSON OR FOR LOSS OF, DAMAGE TO, OR LOSS OF USE OF ANY PROPERTY OCCASIONED BY ERROR, OMISSION, OR NEGLIGENT ACT OF CONTRACTOR, ITS SUBCONTRACTORS, ANY OFFICERS, AGENTS OR EMPLOYEES OF CONTRACTOR OR ANY SUBCONTRACTORS, INVITEES, AND ANY OTHER THIRD PARTIES OR PERSONS FOR WHOM OR WHICH CONTRACTOR IS LEGALLY RESPONSIBLE, IN ANY WAY ARISING OUT OF, RELATING TO, RESULTING FROM, OR IN CONNECTION WITH THE PERFORMANCE OF THIS CONTRACT, AND CONTRACTOR WILL AT ITS OWN COST AND EXPENSE DEFEND AND PROTECT OWNER FROM ANY AND ALL SUCH CLAIMS AND DEMANDS.

CONTRACTOR DOES HEREBY AGREE TO WAIVE ALL CLAIMS, RELEASE, INDEMNIFY, DEFEND AND HOLD HARMLESS INDEMNITEES FROM AND AGAINST ANY AND ALL CITATIONS, CLAIMS, COSTS, DAMAGES, DEMANDS, EXPENSES, FINES, JUDGMENTS, LIABILITY, LOSSES, PENALTIES, SUITS OR CAUSES OF ACTION OF EVERY KIND INCLUDING ALL EXPENSES OF LITIGATION AND/OR SETTLEMENT, COURT COSTS AND ATTORNEY FEES FOR INJURY, SICKNESS, DISEASE OR DEATH OF ANY EMPLOYEE, AGENT OR REPRESENATIVE OF CONTRACTOR OR ANY OF ITS SUBCONTRACTORS, REGARDLESS OF WHETHER THE CITATIONS, CLAIMS, COSTS, DAMAGES, DEMANDS, EXPENSES, FINES, JUDGMENTS, LIABILITY, LOSSES, PENALTIES, SUITS OR CAUSES OF ACTION ARISE IN WHOLE OR IN PART FROM THE NEGLIGENCE OF INDEMNITEES. IT IS THE EXPRESS INTENTION OF THE PARTIES HERETO THAT THE INDEMNITY PROVIDED FOR IN THIS PARAGRAPH IS AN INDEMNITY BY CONTRACTOR FOR THE BENEFIT OF THE OWNER FROM THE CONSEQUENCES OF OWNER'S NEGLIGENCE, WHETHER THAT NEGLIGENCE IS A SOLE OR CONCURRING CAUSE OF THE INJURY, SICKNESS, DISEASE OR DEATH OF CONTRACTOR'S EMPLOYEE OR EMPLOYEE OF ANY OF ITS SUBCONTRACTORS.

IN ANY AND ALL CLAIMS AGAINST ANY PARTY INDEMNIFIED HEREUNDER BY ANY EMPLOYEE OF THE CONTRACTOR, ANY SUB-CONTRACTOR, ANYONE DIRECTLY OR INDIRECTLY EMPLOYED BY ANY OF THEM OR ANYONE FOR WHOSE ACTS ANY OF THEM MAY BE LIABLE, THE INDEMNIFICATION OBLIGATION HEREIN PROVIDED SHALL NOT BE LIMITED IN ANY WAY BY ANY LIMITATION ON THE AMOUNT OR TYPE OF DAMAGES, COMPENSATION OR BENEFITS PAYABLE BY OR FOR THE CONTRACTOR OR ANY SUB-CONTRACTOR UNDER WORKMEN'S COMPENSATION OR OTHER EMPLOYEE BENEFIT ACTS.

INDEMNIFIED ITEMS SHALL INCLUDE, BUT NOT BE LIMITED TO, ATTORNEYS' FEES AND COSTS, COURT COSTS AND SETTLEMENT COSTS, INCURRED BY AN INDEMNIFIED INDIVIDUAL OR ENTITY IN ATTEMPTING TO ENFORCE THIS INDEMNITY.

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THE CONTRACTOR IS NOT REQUIRED TO INDEMNIFY OR DEFEND THE DESIGN PROFESSIONAL, ANY LICENSED ENGINEER, OR AN AGENT, SERVANT, OR EMPLOYEE OF THE DESIGN PROFESSIONAL OR LICENSED ENGINEER FROM LIABILITY THAT MAY ARISE FROM DEFECTS IN THE PLANS, DESIGNS OR SPECIFICATIONS OR NEGLIGENCE ON THE PART OF THE DESIGN PROFESSIONAL OR LICENSED ENGINEER IN THE RENDITION OR CONDUCT OF PROFESSIONAL DUTIES ARISING FROM THE CONTRACT AND THE PLANS DESIGNS OR SPECIFICATIONS THAT ARE PART OF THE CONSTRUCTION CONTRACT AS SET FORTH IN CHAPTER 130 OF THE TEXAS CIVIL PRACTICE AND REMEDIES CODE.

b. THE CONTRACTOR'S INDEMNITY OBLIGATIONS UNDER THIS SECTION 3.18 SHALL ALSO SPECIFICALLY INCLUDE, WITHOUT LIMITATION, ALL FINES, PENALTIES, DAMAGES, LIABILITY, SAFETY VIOLATIONS, COSTS, EXPENSES (INCLUDING, WITHOUT LIMITATION, REASONABLE ATTORNEYS' FEES), AND PUNITIVE DAMAGES, IF ANY, ARISING OUT OF, OR IN CONNECTION WITH ANY:

.1 VIOLATION OF OR FAILURE COMPLY WITH ANY LAW, STATUTE, ORDINANCE, RULE, REGULATION, CODE OR REQUIREMENT OF A PUBLIC AUTHORITY THAT BEARS UPON THE PERFORMANCE OF THE WORK BY THE CONTRACTOR, A SUBCONTRACTOR OR ANY PERSON OR ENTITY FOR WHOM EITHER IS RESPONSIBLE;

.2 MEANS, PROCEDURES, TECHNIQUES, SAFETY PRECAUTIONS, OR SEQUENCES OF EXECUTION OR PERFORMANCE OF THE WORK; AND

.3 FAILURE TO SECURE AND PAY FOR PERMITS, FEES, APPROVALS, LICENSES, AND INSPECTION AS REQUIRED UNDER THE CONTRACT DOCUMENTS, OR ANY VIOLATION OF ANY PERMIT OR OTHER APPROVAL OF A PUBLIC AUTHORITY APPLICABLE TO THE WORK, BY THE CONTRACTOR, A SUBCONTRACTOR, OR ANY PERSON OR ENTITY FOR WHOM EITHER IS RESPONSIBLE.

c. THE CONTRACTOR SHALL INDEMNIFY AND HOLD HARMLESS ALL OF THE INDEMNITEES SET OUT IN SECTION 3.18.a FROM AND AGAINST ANY COSTS AND EXPENSES (INCLUDING REASONABLE ATTORNEYS' FEES) INCURRED BY ANY OF THE INDEMNITEES IN ENFORCING ANY OF THE CONTRACTOR'S DEFENSE, INDEMNITY, AND HOLD-HARMLESS OBLIGATIONS UNDER THIS CONTRACT.

Article 4. DESIGN PROFESSIONAL

Section 4.1 General

a. The Design Professional is the person or entity retained by the Owner pursuant to Section 2.3.b and identified as such in the Agreement.

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b. Duties, responsibilities, and limitations of authority of the Design Professional as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Design Professional. Consent shall not be unreasonably withheld.

Section 4.2 Administration of the Contract

a. The Design Professional will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Design Professional issues the final Certificate for Payment. The Design Professional will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

b. The Design Professional will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, as the Work progresses and when fully completed, will be in accordance with the Contract Documents. However, the Design Professional will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Design Professional will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, except as provided in Section 3.3.a.

c. On the basis of the site visits, the Design Professional will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Design Professional will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Design Professional will not have control over or charge of and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

i. **NEITHER THE OWNER NOR THE DESIGN PROFESSIONAL NOR THE OWNER'S OTHER CONSULTANTS SHALL BE RESPONSIBLE OR LIABLE FOR THE SAFETY PROGRAM(S) DEVELOPED BY THE CONTRACTOR OR ITS SUBCONTRACTORS FOR THE SAFETY OF PERSONS AND PROPERTY, OR FOR COMPLIANCE WITH STATUTES, RULES, REGULATIONS, AND ORDERS APPLICABLE TO CONDUCT THE WORK. SHOULD ANY CONTRACTOR OR THEIR SUBCONTRACTOR(S), OR THE SUB-SUBCONTRACTOR(S) MAKE A CLAIM AGAINST THE INDEMNITEES, OR SHOULD THEY OR ANY GOVERNMENTAL ENTITY BRING ANY ACTION OR LEVY ORAND FINE OR PENALTY AGAINST THE INDEMNITEES ON ACCOUNT OF ANY SAFETY-RELATED DAMAGE OR VIOLATION OF LAW ALLEGED TO HAVE BEEN SUSTAINED, THE CONTRACTOR AGREES THAT IT WILL HOLD THE INDEMNITEES HARMLESS AGAINST ANY SUCH VIOLATION, FINE, CLAIM OR SUIT, AND THAT IT WILL REIMBURSE THE INDEMNITEES THE COST OF DEFENDING SUCH SUIT,**

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AND IF ANY JUDGMENT AGAINST THE INDEMNITEES ARISES THEREFROM, THE CONTRACTOR SHALL PAY OR SATISFY IT AND SHALL PAY ALL COSTS INCURRED BY THE INDEMNITEES.

d. Communications

The Owner and Contractor shall include the Design Professional in all communications about the Design Professional's services or professional responsibilities. The Owner shall promptly notify the Design Professional of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Design Professional's consultants shall be through the Design Professional. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

i. Failure of Contractor to give the Owner or Design Professional written notice of Contractor's objections, within three (3) business days, to directives, instructions, interpretations, or minutes from the Owner or Design Professional, shall constitute final and conclusive consent on the part of the Contractor to such directives, instructions, interpretations, or minutes of the Owner or Design Professional.

ii. Any written notice from the Owner or Design Professional to the Contractor shall be sufficiently given when delivered to the last known business address of the Contractor, or to its registered or authorized agent, representative, or officer. Any written notice from the Contractor to the Owner shall be sufficiently given when personally delivered to the Owner's Office, Attn: Project Manager, or at such other address and to the attention of such person as the Owner may from time to time designate in writing.

e. Based on the Design Professional's evaluations of the Contractor's Applications for Payment, the Design Professional will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

f. The Design Professional has authority to reject Work that does not conform to the Contract Documents. Whenever the Design Professional considers it necessary or advisable, the Design Professional will have the authority to require inspection or testing of the Work in accordance with Sections 13.4.b and 13.4.c, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Design Professional nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Design Professional to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.

g. The Design Professional will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Design Professional's action will be taken in accordance with the submittal schedule approved by the Design Professional or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Design Professional's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor

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as required by the Contract Documents. The Design Professional's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 1.2, 3.2.a, 3.3, 3.5, 3.12, and 13.9. The Design Professional's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Design Professional's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

h. The Design Professional will prepare Change Orders and Construction Change Directives and may order minor changes in the Work as provided in Section 7.4. The Design Professional will investigate and make recommendations regarding concealed and unknown conditions as provided in Section 3.7.d.

i. The Design Professional will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

j. If the Owner and Design Professional agree, the Design Professional will provide one or more Project representatives to assist in carrying out the Design Professional's responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

k. The Design Professional will interpret matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Design Professional's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

l. Interpretations of the Design Professional will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations, the Design Professional will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

m. The Design Professional's opinions on matters relating to aesthetic effect will be considered by the Owner when making the Owner's determination on these issues and the Owner's decision will be final if consistent with the intent expressed in the Contract Documents. Such Owner's determination shall be communicated through the Design Professional.

n. The Design Professional will review and respond to requests for information about the Contract Documents. The Design Professional's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Design Professional will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

Article 5. SUBCONTRACTORS

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Section 5.1 Definitions

a. A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.
b. A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

Section 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

a. Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Design Professional of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Design Professional may notify the Contractor whether the Owner or the Design Professional (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Design Professional to provide notice within the 14-day period shall constitute notice of no reasonable objection.
b. The Contractor shall not contract with a proposed person or entity to whom the Owner or Design Professional has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.
c. If the Owner or Design Professional has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Design Professional has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.
d. The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Design Professional makes reasonable objection to such substitution.
e. Upon request, the Contractor shall provide to the Owner an executed copy of all subcontracts, purchase orders, and other agreements relating to the Work.
f. The Contractor shall not sublet the Work as a whole. The approval of subcontractors in no way relieves the Contractor from full responsibility.

Section 5.3 Subcontractual Relations

a. By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including responsibility for safety of the Subcontractor's Work, which the Contractor, by the Contract Documents, assumes toward the Owner , the Owner's other consultants and Design

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Professional. Each subcontract agreement shall preserve and protect the rights of the Owner , the Owner's other consultants, and Design Professional under the Contract Documents with respect to the Work to be performed by the Subcontractor. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available for review for each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors. Notwithstanding the above, all Agreements with the Owner shall have all references to compensation redacted before disclosing to Subcontractors, sub-Subcontractors, or any other tier of vendor.

b. All subcontracts shall be in writing in form and substance substantially similar to the Contractor's standard form subcontract, attached to the Agreement and made a part thereof as an Exhibit, and shall specifically provide that the Owner is an intended third-party beneficiary of such subcontract. The Contractor's subcontractors, however, are not intended third-party beneficiaries of this Agreement by pass through, assignment, or otherwise, except as provided in the Contract Documents, and the Owner shall not be bound to Contractor's subcontract agreements.
c. Whenever the Contractor receives payment pursuant to the Contract Documents, the Contractor shall make payments to each of its Subcontractors of any amounts actually received which were included in the Contractor's Application for Payment to the Owner for such subcontracts unless otherwise allowed to withhold payment by the terms and conditions of the subcontract or as allowed by law. The Contractor shall make such payments within ten (10) days of receipt of payment from the Owner in the same manner as the Owner is required to pay the Contractor under the Contract Documents if the Subcontractor is satisfactorily performing under its contract with the Contractor. Such payments from Owner to Contractor shall be imposed with an express trust to assure that payment is made to all Project Subcontractors, Sub-subcontractors, and suppliers. In addition to the express trust imposed upon such funds and the fiduciary duties incumbent upon the Contractor, Texas Property Code Chapter 162 shall apply.
d. The Contractor shall monitor the Subcontractors, who shall pay all suppliers, Sub-subcontractors, laborers, and any other persons who provide goods, materials, labor, or equipment to the Subcontractor any amounts actually received which were included in the Subcontractor's request for payment to the Contractor for such persons, within ten (10) days of receipt of payment from the Contractor. The construction payments made by the Contractor to the Subcontractor shall be trust funds as set forth in Chapter 162 of the Texas Property Code. If the Subcontractor fails to make such payments in the required manner, the Subcontractor shall pay said suppliers, Sub-subcontractors, and laborers interest as set forth in Chapter 162 of the Texas Property Code.
e. At the time the Subcontractor submits a request for payment to the Contractor, the Subcontractor shall also submit to the Contractor a list of the Subcontractor's suppliers, Sub-subcontractors, and laborers. The Contractor shall be relieved of the requirements of this Section regarding payment in ten (10) days and interest payments until the Subcontractor submits such list. If the Contractor fails to make timely payments to the Subcontractor as required by this Section, the Contractor shall pay the Subcontractor interest as calculated under the provisions of Chapter 2251 of the

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Texas Government Code. Nothing in this Section 5.3 shall be construed to affect the retention provisions of any contract.

f. The provisions of this Section 5.3 shall be made a part of each contract between the Contractor and each Subcontractor, either expressly or by incorporation by reference to this Section of the Contract Documents.

Section 5.4 Contingent Assignment of Subcontracts

a. Each subcontract agreement for a portion of the Work may be assigned by the Contractor to the Owner, provided that

.1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and

.2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

b. If the Work in connection with a subcontract has been suspended for more than thirty (30) days, after termination of the Contract by the Owner pursuant to Section 14.2 and the Owner accepts assignment of such subcontract, the Subcontractor's compensation shall be equitably adjusted for any increase in direct verifiable costs incurred by such Subcontractor as a result of the suspension.

c. Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity, including the performance bond Surety's takeover or completion contractor, which shall relieve the Owner of any legal responsibility under the subcontract.

d. Each subcontract shall specifically provide that the Owner shall only be responsible to the Subcontractor for those obligations that accrue subsequent to the assignment of the Subcontractor to the Owner after suspension and termination of the Contract, as provided in this Section 5.4. This Section 5.4 shall be construed to prohibit a pass through or assignment of rights, unless authorized by the Owner in writing

Section 5.5 Owner Payments to Subcontractors

a. In the event of any default hereunder by the Contractor, or in the event the Owner or Design Professional fails to approve any Application for Payment that is not the fault of a Subcontractor, the Owner may make direct payment to the Subcontractor, less appropriate retainage. In that event, the amount paid the Subcontractor shall be deducted from the payment to the Contractor.

b. Nothing contained herein shall create any obligation on the part of the Owner to make any payments to any Subcontractor, and no payment by the Owner to any Subcontractor shall create any obligation to make any further payments to any Subcontractor.

Article 6. CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

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Section 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

a. The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided in Article 15.
b. When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.
c. The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.
d. Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.
e. The Contractor accepts assignment of, and liability for, all purchase orders and other agreements for procurement of materials and equipment that are listed in and identified as part of the Contract Documents. The Contractor shall be responsible for such pre-purchased items, if any, as if the Contractor were the original purchaser. The Contract Sum includes, without limitation, all costs and expenses in connection with delivery, storage, insurance, installation, and testing of items covered in any assigned purchase orders or agreements. All warranty and correction of the Work obligations under the Contract Documents shall also apply to any pre-purchased items, unless the Contract Documents specifically provide otherwise.

Section 6.2 Mutual Responsibility

a. The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.
b. If part of the Contractor's Work depends on proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Design Professional of any apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Design Professional of these apparent discrepancies or defects prior to

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proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work.

c. The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

d. The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.e.

e. The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

f. Should the Contractor wrongfully delay or cause damage to the work or property of any Separate Contractor, the Contractor shall, upon due notice, promptly attempt to settle with such other contractor by agreement or otherwise to resolve the dispute. If such Separate Contractor sues or initiates a judicial proceeding against the Owner on account of any delay or damage alleged to have been caused by the Contractor, the Owner shall notify the Contractor who shall defend such proceedings at the Contractor's expense. The Owner may fund the defense of such proceedings contemplated by this Section but, in any event, if any judgment or award against the Owner arises therefrom, the Contractor shall pay to satisfy it to the extent of Contractor's responsibility.

g. **SHOULD ANY SUCH SEPARATE CONTRACTOR WRONGFULLY DELAYED OR DAMAGED BY THE CONTRACTOR OR PERSONS FOR WHOM THE CONTRACTOR IS RESPONSIBLE PER SECTION 6.2.f MAKE A CLAIM AGAINST THE INDEMNITEES, OR BRING ANY ACTION AGAINST THE INDEMNITEES, ON ACCOUNT OF THE DAMAGE ALLEGED TO HAVE BEEN SO SUSTAINED, THE CONTRACTOR SHALL HOLD THE INDEMNITEES HARMLESS AND DEFEND THEM AGAINST ANY SUCH CLAIM OR SUIT, AND SHALL REIMBURSE TO THE INDEMNITEES THE COST INCLUDING, WITHOUT LIMITATION, REASONABLE, ADDITIONAL ATTORNEY'S FEES INCURRED DEFENDING SUCH SUIT, AND IF ANY JUDGMENT AGAINST THE INDEMNITEES ARISES THERE FROM, THE CONTRACTOR SHALL PAY OR SATISFY IT AND SHALL PAY ALL COSTS INCURRED BY THE INDEMNITEES.**

h. Should the Contractor be caused damage by any Owner's Separate Contractor(s)'s work, by reason of such Owner's Separate Contractor's failure to perform properly under its contract with the Owner, no action will lie against the Owner, and the Owner shall have no liability therefor, but the Contractor may assert its claims for damages directly against such Owner's Separate Contractor and the Owner shall reasonably assist the Contractor. by assign such rights to Contractor, unless otherwise prohibited under Texas law.

i. Inasmuch as the completion of the building within the prescribed time is dependent very largely upon the close and active cooperation of all those engaged therein, it is, therefore expressly understood and agreed that each contractor shall lay out and install its work at such time(s) and in such manner as to not delay or interfere with the carrying forward of the work of the other contractors.

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j. Where the work of one contractor directly affects the conditions of the work of another contractor including, as examples only, and not limited to, providing shoring for backfilling, providing protective covering for painting, providing adequate bracing of door jambs, etc., the contractor performing the work which will adversely affect another contractor's work shall be responsible for providing adequate protection based upon methods used to perform its work.

Section 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, or the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Design Professional will allocate the cost among those responsible, which allocation shall be final.

Article 7. CHANGES IN THE WORK

Section 7.1 General

a. Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.
b. A Change Order shall be based upon agreement among the Owner, Contractor, and Design Professional. A Construction Change Directive requires agreement by the Owner and Design Professional and may or may not be agreed to by the Contractor. An order for a minor change in the Work not involving an adjustment in the Contract Sum or an extension of the Contract Time and reasonably inferable from the intent of the Contract Documents may be issued by the Design Professional alone.
c. Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work. Except as permitted in Section 7.3 or as otherwise provided herein, a change in the Contract Sum or the Contract Time shall be accomplished only by Change Order. Accordingly, no course of conduct or dealings between the parties, nor express or implied acceptance of alterations or additions to the Work, and no claim that Owner has been unjustly enriched by any alteration of or addition to the Work, whether or not there is, in fact, any unjust enrichment to the Work, shall be the basis of any claim to an increase in any amounts due under the Contract Documents or a change in any time period provided for in the Contract Documents.

Section 7.2 Change Orders

a. A Change Order is a written instrument prepared by the Design Professional and signed by the Owner, Contractor, and Design Professional stating their agreement upon all of the following:
    .1 The change in the Work;
    .2 The amount of the adjustment, if any, in the Contract Sum; and
    .3 The extent of the adjustment, if any, in the Contract Time.

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b. Methods used in determining adjustments to the Contract Sum may include those listed in Sections 7.3.c, 7.3.g and 7.3.j.

c. Agreement on any Change Order constitutes a final settlement of all past and future claims, at law or in equity, concerning all matters relating to the change in the Work that is the subject of the Change Order, including, but not limited to, delays, all direct and indirect costs, any claim for damages associated with such change, and any and all adjustments to the Contract Sum and the construction schedule.

d. Change Orders Requiring City Council Approval

The Contract Sum may not be increased because of a Change Order unless additional money for increased costs is appropriated for that purpose from available funds or is provided for by the authorization of the issuance of time warrants. The approval of the Denton City Council is required if a Change Order involves a decrease or an increase of $50,000.01 or more. The original Contract Sum also may not be increased under this Section 7.2 by more than twenty-five percent (25.0%) over the entire duration of the Project. The original Contract Sum may not be increased by more than twenty-five percent (25%) over the entire duration of the Project for any reason; nor may it be decreased by more than twenty-five percent (25%) without the consent of the Contractor, as provided in Texas Local Government Code Sec. 252.048. After the Change Order is submitted by the Contractor under this Section 7.2, the additional time required to obtain City Council approval shall not be factored into any past or future claim for delays or calculated as a part of the Change Order request.

Section 7.3 Construction Change Directives

a. A Construction Change Directive is a written order prepared by the Design Professional and signed by the Owner and Design Professional, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

b. A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

c. If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

.1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;

.2 Unit prices stated in the Contract Documents or subsequently agreed upon;

.3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed fee; or

.4 As provided in Section 7.3.d.

d. If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Design Professional shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit calculated using the sum of the actual costs allowed in Sections 7.3.d.1 through 7.3.d.5, and using the percentages as

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set forth in Section 7.3.l below. In such case, and also under Section 7.3.c, the Contractor shall keep and present, in such form as the Design Professional may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.d shall be limited to the following:

.1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Design Professional;

.2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;

.3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;

.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and

.5 Additional, verifiable payroll and subsistence costs incurred by the Contractor, Subcontractor, and Sub-subcontractor of field personnel directly attributable to the change.

e. If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

f. Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Design Professional of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

g. A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

h. The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Design Professional. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

i. Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Design Professional will make an interim recommendation for purposes of monthly certification for payment for those costs and certify for payment the amount that the Design Professional recommends, in the Design Professional's professional judgment, to be reasonably justified. The Design Professional's interim recommendation of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

j. When the Owner and Contractor agree with a recommendation made by the Design Professional concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Design Professional will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

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k. If the Owner and Contractor do not agree with the adjustment in Contract Time or the method for determining it, the adjustment or the method shall be referred to the Design Professional for determination. The Design Professional may consult with the Owner in connection with such determination either at the direction of the Owner or at the Design Professional's discretion. If the Contractor does not ultimately agree with the Design Professional's determination, the Contractor may assert a Claim in accordance with Article 15.

l. In Subparagraph 7.3.d, the allowance for the combined total of onsite and offsite overhead and profit included in the total cost to the Owner shall be based on the following schedule:

.1 For the Contractor, for Work performed by the Contractor's own forces, fee percentage of the Cost of Work stated in Section 5.1.a of the Stipulated Sum Agreement plus actual direct jobsite costs associated with the additional work, if any;

.2 For the Contractor, for Work performed by the Contractor's Subcontractor, fee percentage of the Cost of Work stated in the Stipulated Sum Agreement, if any, plus actual direct jobsite costs associated with the additional work, if any;

.3 For each Subcontractor or Sub-subcontractor involved, for Work performed by that Subcontractor or Sub-subcontractor's own forces, ten percent (10%) of the cost;

.4 For each Subcontractor, for Work performed by the Subcontractor's Sub-subcontractors, five percent (5%) of the amount due the Sub-subcontractor;

.5 Cost to which overhead and profit is to be applied shall be determined in accordance with Section 7.3.d;

.6 Under no circumstance shall costs of the Contractor's supervisory, management, administrative or other office personnel, regardless of where stationed, be paid as cost of the Work under 7.3.d Conversely, the Contractor shall be compensated for their labor within the overhead and profit percentage specified in this Section 7.3.l;

.7 In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can immediately be seen by inspection, shall be accomplished by a complete itemization of costs including labor, materials, and subcontracts. Labor and materials shall be itemized in the manner prescribed above. Where major cost items are subcontracts, they shall be itemized also;

.8 When both additions and credits are involved in any change, the allowance for overhead and profit shall be figured on the basis of the net increase or decrease, if any; and

.9 Overtime, when specifically authorized by the Owner and not as a requirement for the Contractor to fulfill its obligations under this Agreement, shall be paid for by the Owner on the basis of premium payment only, plus the cost of insurance and taxes based on the premium payment period. Overhead and profit will not be paid by the Owner for overtime.

Section 7.4 Minor Changes in the Work

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The Design Professional may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Design Professional's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Design Professional and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Design Professional's order for a minor change without prior notice to the Design Professional that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

Section 7.5 Supporting Information

Notwithstanding the above, requests for an adjustment in the Contract Sum or adjustment in the Contract Time shall be in a form and accompanied by supporting information with a level of detail wholly acceptable to the Owner and Design Professional. The Contractor shall also comply with all provisions of Articles 8 and 15 with respect to claims. The required information shall be provided by the Contractor in less than twenty-one (21) days from the Contractor's request for an adjustment in the Contract Sum or Contract Time. Failure to timely provide this information in the proper form may be, in and of itself, grounds for rejection of the request, at the sole discretion of the Owner or Design Professional.

Article 8. TIME

Section 8.1 Definitions

a. Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.
b. The date of commencement of the Work is the date established in the Agreement. The date shall not be postponed by the failure to act of the Contractor or of persons or entities for whom the Contractor is responsible.
c. The date of Substantial Completion is the date certified by the Design Professional in accordance with Section 9.8.
d. The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

Section 8.2 Progress and Completion

a. Time limits stated in the Contract Documents are of the essence. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.
b. The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance. Unless the date of commencement is established by a Notice to Proceed given by the Owner, the Contractor shall notify the Owner in writing not less than five (5) days or other agreed period before commencing the Work to permit the timely filing of any additional necessary documents.
c. Attention is directed to the fact that the Work is urgently needed by the Owner; for this reason it shall be agreed that the Contractor will substantially complete all Work under the Contract within the time established in the Contract Documents and the most recently approved Contractor's

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Project Schedule. The Contractor shall begin the Work on the date of commencement as defined in the Contract Documents; carry the Work forward with adequate resources; furnish, without limitation such labor, supervision, materials, facilities, and equipment; and work such hours, including night shifts, overtime operations, and Sundays and/or holidays, as may be necessary to ensure the progress and completion of both the Work and the Project as reflected by the most recently approved Contractor's Project Schedule.

d. The Contractor shall achieve specific Contractual Milestone dates (if any), Substantial Completion, and Final Completion within the times stated in the Contract Documents, and such dates shall be adhered to and shall be the last acceptable dates for completion of Work required for those milestones and completions, unless and until modified by the Owner in writing.
e. The Contractor understands and agrees that all Work must be performed in an orderly and closely coordinated sequence so that the dates for Contractual Milestones (if any), Substantial Completion, and Final Completion, may be met by the both the Contractor as well as the respective Separate Contractors.
f. The Contractor shall also complete the Work in all of its details for final acceptance as expeditiously as possible after Substantial Completion.
g. The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

Section 8.3 Delays and Extensions of Time

a. If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Design Professional, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, implementation of Federal law or policies, unusual delay in transportation, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.f.ii, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation; or (5) by other causes that the Design Professional recommends may, justify delay, then the Contract Time may be extended for such reasonable time as the Owner may determine.
b. Claims relating to time shall be made in accordance with applicable provisions of Article 15.
c. This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.
d. Any claims for extension of time shall be made in writing to the Owner and Design Professional not more than ten (10) days after commencement of the delay; otherwise it shall be waived. In the case of a continuing delay only one claim is necessary. The Contractor shall provide an estimate of the probable effect of such delay on the progress of work within five (5) days of the first date the Contractor should reasonably be expected to have calculated the impact of such delay, but in no event more than fifteen (15) days after the commencement of the delay, with weekly updates to the impact if the delay is of an ongoing nature.
e. Extensions of the Contract Time will be made for delays due to weather conditions only when such conditions are more severe and extended than those reflected by the ten (10) year average for the month as evidenced by the National Climatic Data Center's (NCDC's) Surface Data US at http://gis.ncdc.noaa.gov/ website/ims-cdo/sod/viewer.htm or other data as mutually agreed by the Owner and Contractor for the Project area.

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f. In allowing delays for weather, the Owner will be entitled to consider weather conditions prevailing throughout the entire Contract period. The Owner and Contractor will together reconcile actual working days lost and gained over the entire Contract period every ninety (90) days. The Contractor shall then adjust the schedule activities accordingly for both the Contractor's weather float reserves and Owner's float reserves where those activities are carried in the Contractor's Project Schedule (if any).Extensions of time due to weather or other allowable reasons will be granted on the basis of one-and-four-tenths (1.4) calendar days credit for every working day lost, with each separate extension figured to the nearest whole calendar day.

g. The extension of the contract completion time for weather conditions will occur only in the event that the weather in question affected critical activities on the most current Contractor's Construction Schedule, and at least one half of the work force allocated to that item of work was also adversely affected by the same weather conditions.

Section 8.4 Contractor's Obligations After Delay

a. If either the Work actually in place falls behind as reflected by the currently updated Master Project Schedule or Contractor's Construction Schedule, or it becomes apparent or likely in the reasonable opinion of the Owner after consultation with the Design Professional that the Work will not be completed within the Contract Time or in accordance with the Contractor's Construction Schedule, due to delays caused by the Contractor or its subcontractors, the Contractor agrees it shall, as necessary, take some or all of the following actions (hereinafter referred to collectively as "Extraordinary Measures") at no additional cost to the Owner or Design Professional, as required to substantially eliminate, in the judgment of the Owner, the backlog of Contractor's Work on the Project:

    .1 Increase quantities of, without limitation, labor, supervision, material deliveries, equipment on site, and crafts as necessary;

    .2 Increase the number of working hours per shift, shifts per working day, working days per week, or any combination of the foregoing;

    .3 Reschedule activities to achieve maximum practical concurrence of accomplishment; and

    .4 Do whatever else is reasonably required by the Owner or Design Professional.

b. These Extraordinary Measures shall continue until the progress of the Work complies with the stage of completion required by the Contract Documents. The Owner's right to require Extraordinary Measures is solely for the purpose of ensuring the Contractor's compliance with the Contractor's Construction Schedule.

c. In the event of a delay, the Owner Design Professional may also require the Contractor to immediately submit a Proposed Recovery Schedule as specified in Section 3.10.h above. If the Proposed Recovery Schedule is not satisfactory, the Design Professional may unilaterally establish a new Proposed Recovery Schedule acceptable to the Owner; issue it as a Construction Change Directive; and the Contractor shall comply therewith. The Owner may also require the Contractor to take any of the Extraordinary Measures to make up the lag in scheduled progress, all without additional cost to the Owner, or Design Professional.

d. Failure of the Contractor to substantially comply with the requirements of this Section 8.4 shall be considered grounds for a determination by the Owner, after consultation with the Design

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Professional, that the Contactor is in breach of this Agreement by failing to prosecute the Work and that of the Project so as to ensure its completion within both the Contract Time and the updated Contractor's Construction Schedule.

e. Likewise, in the event the progress of the Project falls behind the predictions of the Master Project Schedule through no fault of the Contractor, the Owner or Design Professional may request, and the Contractor may agree to take one or more of the Extraordinary Measures, with the Owner bearing the cost for such measures by Change Order.

f. The Contractor shall not be entitled to an adjustment in the Contract Sum in connection with Extraordinary Measures required by the Owner under or pursuant to this Section 8.4, except as specifically noted otherwise in Section 8.4.e.

Section 8.5 Owner's Rights After Delay

a. In the event that any Contractor fails, or appears likely to fail, to complete a critical portion of Work on time or to complete a Contractual Milestone Date or completion date as evidenced by the most recently approved Contractor's Project Schedule, the Owner or the Design Professional shall have the right to impose any or all of the following options:

.1 Require the Contractor to substantiate the capability to get back on schedule within ten (10) business days;

.2 Require the Contractor to take some or all of the Extraordinary Measures, and do whatever else is required by the Owner or Design Professional until Contractor confirms, to the satisfaction of the Owner and Design Professional, the progress of the Work is in compliance and congruence with the most recently approved Contractor's Construction Schedule, such measures being at no extra cost to Owner and Design Professional;

.3 Withhold progress payment, or portions thereof, until such time as the Contractor is in compliance with the most recently approved Contractor's Project Schedule; and

.4 Contact or visit the factory, plant or distribution center whose production or delivery schedule may be critical to the scheduled completion of a portion of the contract work, and expedite same, at Contractor's expense.

Section 8.6 Liquidated Damages

a. Should the Contractor fail to substantially complete the Work on, or before, the original date set forth in the Contract, or on or before the revised date as granted by extensions to Contract Time, the Owner may at its sole discretion permit the Contractor to proceed, and in such case, there shall be deducted from any monies due or which may become due the Contractor, a sum as specified herein, for each and every calendar day that the Work shall remain uncompleted. This sum shall be considered, not as penalty, but as the cost(s) for substantial losses suffered by the public and the Owner. Liquidated damages are intended to compensate the Owner for the Contractor's failure to meet the deadlines set forth herein, and shall not excuse the Contractor from liability from any other breach of requirements of the Contract Documents, including any failure of the Work to conform to applicable requirements. The Contractor agrees that the sums in Section 8.6.b are reasonable in light of the anticipated or actual harm caused by the breach, the difficulties of the proof of loss, and the inconvenience or nonfeasibility of otherwise obtaining an

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adequate remedy. Contractor further acknowledges and agrees that Liquidated Damages may be owing even though no termination has occurred.

b. Contractor shall pay as liquidated damages to the Owner: the sums shown in the table below for each calendar day that expires after the date set forth in the Contract for Final Completion of the Work.

First Week Late	Second Week Late	Third & Fourth Weeks Late	Every Day After the Fourth Week Late
$500/day	*$500/day*	*$500/day*	*$500/day*

c. The parties acknowledge, covenant, and agree that the daily basis and the amount set forth above for liquidated damages are reasonable because of the unique nature of the Project as a benefit to the public; the fact that inconvenience to the public will be one of the significant impacts of any failure by the Contractor to timely complete the Work; and that it is impracticable and extremely difficult to ascertain and determine the actual losses which would accrue to the Owner and the public.

d. Permitting the Contractor to continue and finish the Work, or any portion thereof, after the time fixed for its completion, shall in no way operate as a waiver on the part of the Owner of any of its rights under the Contract. The Contractor acknowledges the Owner receives no benefits from early completion of the Project or the Work, therefore all rights, if any, to an early completion bonus or other increases in the Contract Sum for such early completion are hereby waived by the Contractor.

Article 9. PAYMENTS AND COMPLETION

Section 9.1 Contract Sum

a. The Contract Sum is stated in the Agreement and, is the maximum amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents. The Contract Sum may only be increased pursuant to a Change Order signed by the Owner. Completion of the Work is a condition precedent to Owner's obligation to pay the full Contract Sum.

b. If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

Section 9.2 Schedule of Values

Where the Contract is based on a Stipulated Sum or the Cost of the Work, the Contractor shall meet with the Design Professional, at the Preconstruction Conference with a proposed Schedule of Values as specified in Section 3.10. The Contractor's Schedule of Values will be reviewed by the Owner and Design Professional in the context of the Contractor's proposed Construction Management Plan, including, but not limited to, the Contractor's Construction Schedule therein. The values assigned to each work activity in the Schedule of Values should be generated by the projected earned value of the activities in the Contractor's Construction Schedule, rounded to the nearest five dollars, and equal in aggregate to

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the Contractor's and Subcontractor's contract amount(s). The Schedule of Values shall allocate the entire Contract Sum to the various portions of the Work and be prepared in such form and supported by such additional data to substantiate its accuracy as the Owner and Design Professional may require. This Schedule, of Values, unless objected to by the Owner or Design Professional, shall be used as a basis for reviewing the Contractor's Applications for Payment.

Section 9.3 Applications for Payment

a. At least ten days before the date established for each progress payment, the Contractor shall submit to the Design Professional an itemized Application for Payment prepared in accordance with the Schedule of Values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Design Professional require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers and shall reflect retainage if provided for in the Contract Documents. The Application for Payment shall be notarized and include other documentation as reasonably required by the Owner; submitted electronically.
    i. As provided in Section 7.3.i, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim recommendations of the Design Professional, but not yet included in Change Orders.
    ii. Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.
    iii. Each Application for Payment shall be accompanied by the following, all in form and substance satisfactory to the Owner and Design Professional and in compliance with all applicable statutes:
        .1 A duly executed and acknowledged sworn statement showing all Subcontractors and material suppliers with whom the Contractor has entered into subcontracts, the amount of each such subcontract, the invoice from and the amount requested for any Subcontractor and material supplier in the requested Application for Payment, and the amount to be paid to the Contractor from such progress payment, together with similar sworn statements from all such Subcontractors and material suppliers;
        .2 Duly executed statutory conditional waivers of mechanics' and material suppliers' lien for progress payments with teach payment application; and appropriate statutory unconditional waivers of mechanics' and material suppliers' liens for progress payments; and appropriate statutory unconditional waivers for final payments from all Subcontractors and, when appropriate, from material suppliers and lower tier Sub-subcontractors establishing payment or satisfaction of payment of all amounts requested by the Contractor on behalf of such entities or persons in any previous Application for Payment;
        .3 An updated Contractor's Construction Schedule per Section 3.10 clearly showing the actual progress of the Work for each activity against the Work

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previously scheduled to be completed during the period, and against targeted activities' previously approved completion dates; and

.4 With every Payment Request for the Work, contractor will submit an affidavit stating that the contractor has complied with the requirements of Chapter 2258, Texas Government Code. The parties hereto agree that any electronic copy of such affidavit shall be treated as an original for all intents and purposes;

.4 If required by the Owner's title insurer, if any, the Contractor shall execute a personal gap undertaking in form and substance satisfactory to such title insurer; and.

.5 Notwithstanding the above, Applications for Payment shall be in a form and accompanied by supporting information with a level of detail wholly acceptable to the Design Professional, and shall include, at a minimum, an updated monthly Contractor's Construction Schedule clearly and graphically comparing the actual "work-in-place" completed to the Work previously projected to be complete for the period. Failure to provide this information in the proper form may be, in and of itself, grounds for rejection of the Application for Payment, at the discretion of the Design Professional.

b. Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the stored materials and equipment which must be properly tagged as to material and job identification; must be available for inspection by the Design Professional; and such requests for payment must be accompanied by documentary evidence as specified, without limitation, in Sections 3.13 and 11.3, which supports the request's validity; quantity and value of materials; proper material acceptance and storage; and including insurance on the materials as evidenced by a Certificate of Insurance or otherwise protects the Owner's interests. Such request shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site. Such materials shall be:

.1 Protected from diversion, destruction, theft, and damage to the satisfaction of the Owner, and the Lender;

.2 Specifically marked for use on the Project; and

.3 Segregated from other materials at the storage facility.

c. The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner either by incorporation in the construction or upon the receipt of payment by the Contractor, whichever occurs. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

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d. THE CONTRACTOR FURTHER EXPRESSLY UNDERTAKES TO DEFEND THE INDEMNITEES, AT THE CONTRACTOR'S SOLE EXPENSE, AGAINST ANY ACTIONS, LAWSUITS, OR PROCEEDINGS BROUGHT AGAINST THE INDEMNITEES AS A RESULT OF LIENS OR VERIFIED CLAIMS FILED AGAINST THE WORK, THE SITE OF ANY OF THE WORK, THE PROJECT SITE AND ANY IMPROVEMENTS THEREON, PAYMENTS DUE THE CONTRACTOR, THE PROJECT BOND OR ANY PORTION OF THE PROPERTY OF ANY OF THE INDEMNITEES (REFERRED TO COLLECTIVELY AS "LIENS OR VERIFIED CLAIMS" IN THIS SECTION 9.3.d). THE CONTRACTOR HEREBY AGREES TO INDEMNIFY AND HOLD THE INDEMNITEES HARMLESS AGAINST ANY SUCH LIENS OR VERIFIED CLAIMS AND AGREES TO PAY ANY JUDGMENT OR LIENS OR VERIFIED CLAIMS RESULTING FROM ANY SUCH ACTIONS, LAWSUITS, OR PROCEEDINGS.

Section 9.4 Certificates for Payment

a. The Design Professional will, within seven (7) days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Design Professional recommends is properly due, and notify the Contractor and Owner of the Design Professional's reasons for withholding certification in part as provided in Section 9.5.a; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Design Professional's reason for withholding certification in whole as provided in Section 9.5.a.

b. The issuance of a Certificate for Payment will constitute a representation by the Design Professional to the Owner, based on the Design Professional's evaluation of the Work and the data in the Application for Payment, that, to the best of the Design Professional's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Design Professional. However, the issuance of a Certificate for Payment will not be a representation that the Design Professional has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

c. Certification will be issued for ninety-five percent (95%) of the amount requested by the Contractor and approved by the Design Professional to be properly due until the Contractor is ninety-five percent (95%) completed with the Work. Thereafter, the accumulated retainage may be held without additional retainage, except that, should the Contractor at any time fail to keep current with the approved progress schedule, fail to assure payment to Subcontractors, Sub-

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subcontractors and suppliers as required hereunder; or fail to promptly and diligently correct Work that does not comply with the Contract Documents, certification of ninety-five percent (95%) shall automatically again become effective and shall apply as long as the Contractor lags behind such progress or fails to assure such payment.

Section 9.5 Decisions to Withhold Certification

a. The Design Professional may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Design Professional's opinion the representations to the Owner required by Section 9.4.b cannot be made. If the Design Professional is unable to certify payment in the amount of the Application, the Design Professional will notify the Contractor and Owner as provided in Section 9.4.a. If the Contractor and Design Professional cannot agree on a revised amount, the Design Professional will promptly issue a Certificate for Payment for the amount for which the Design Professional is able to make such representations to the Owner. The Design Professional may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Design Professional's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.b, because of any of the following:

    .1 defective Work not remedied;

    .2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;

    .3 failure of the Contractor to make payments properly to Subcontractors, Sub-subcontractors and suppliers or for labor, materials or equipment;

    .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;

    .5 damage to the Owner or a Separate Contractor;

    .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;

    .7 repeated failure to carry out the Work in accordance with the Contract Documents;

    .8 Contractor's failure to obtain necessary permits or licenses or to comply with applicable codes, regulations, or other laws;

    .9 failure to fully execute the Contract with all associated documents as required;

    .10 bond claims, or liens, filed for any portion of the Work; or

    .11 failure of the Contractor to comply with any provisions of the Contract Documents, including without limitation Section 8.4.

b. Omitted

c. When the reasons for withholding certification are removed, certification will be made for amounts previously withheld less all associated damages, costs and expenses, suffered or accrued by the Owner or Design Professional. In the event the Design Professional nullifies a previously

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issued Project Certificate for Payment, and the Owner has, prior to such nullification, paid thereon, the Contractor shall promptly reimburse to the Owner amounts the latter had previously paid pursuant to the nullified project Certificate for Payment. Alternately, the Owner may withhold payment in any subsequent Application for Payment, until and unless the reasons for nullification of the previously issued project Certificate for Payment have been remedied and all associated damages, costs, and expenses of Owner and Design Professional have been paid by the Contractor.

d. If the Design Professional withholds certification for payment under Section 9.5.a.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Design Professional and the Contractor shall reflect such payment on its next Application for Payment.
e. The Contractor shall not stop work or terminate the Contract if the Design Professional should refuse to issue any certificate because the Application for Payment does not conform with the requirements of Sections 9.3, 9.4, 9.5 or any other portion of these General Conditions, as supplemented herein.

Section 9.6 Progress Payments

a. After the Design Professional has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Design Professional.
b. The Contractor shall pay each Subcontractor, Sub-subcontractor and supplier, no later than ten (10) days after receipt of payment from the Owner the amount to which the Subcontractor, Sub-subcontractor and supplier is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's, Sub-subcontractor's and supplier's portion of the Work, unless otherwise allowed by the provisions of the subcontract or by law. The Contractor shall notify Owner in advance and in writing of any payment(s) to be withheld from any Subcontractor. The Contractor shall, by appropriate agreement with each Subcontractor, Sub-subcontractor and supplier, require each to make payments to their Sub-subcontractors and suppliers in a similar manner.
c. The Design Professional will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Design Professional and Owner on account of portions of the Work done by such Subcontractor.
d. The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven (7) days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Design Professional shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.
e. The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.b, 9.6.c and 9.6.d.

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f. A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of any Work.

g. The Contractor shall not withhold from any Subcontractor sums due the Subcontractor for completed Work which has been paid for by the Owner unless allowed by the terms and conditions of the subcontract as stated in Section 5.3.C of the Agreement or by law. The Contractor shall notify Owner in advance and in writing of any payment(s) to be withheld from any Subcontractor. Sums withheld by the Owner from the Contractor for deficiencies solely attributable to the Contractor shall not be grounds for the Contractor to withhold sums due to any Subcontractor. All sums paid to the Contractor for labor, materials, or equipment for the Work or Project shall be considered trust funds to be used by the Contractor for payment to those persons to the extent providing labor, materials and/or equipment incorporated into the Work or Project. Payments received by the Contractor for Work properly performed by Subcontractors and suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. However, notwithstanding the above, nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

h. **PROVIDED THE OWNER HAS FULFILLED ITS PAYMENT OBLIGATIONS UNDER THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL DEFEND AND INDEMNIFY THE OWNER FROM ALL LOSS, LIABILITY, DAMAGE OR EXPENSE, INCLUDING REASONABLE ATTORNEY'S FEES AND LITIGATION EXPENSES, ARISING OUT OF ANY LIEN CLAIM OR OTHER CLAIM FOR PAYMENT BY ANY SUBCONTRACTOR OR SUPPLIER OF ANY TIER. UPON RECEIPT OF NOTICE OF A LIEN CLAIM OR OTHER CLAIM FOR PAYMENT, THE OWNER SHALL NOTIFY THE CONTRACTOR. IF APPROVED BY THE APPLICABLE COURT, WHEN REQUIRED, THE CONTRACTOR MAY SUBSTITUTE A SURETY BOND FOR THE PROPERTY AGAINST WHICH THE LIEN OR OTHER CLAIM FOR PAYMENT HAS BEEN ASSERTED.**

i. To the extent Contractor has received payment in accordance with the terms of this Agreement, the Contractor agrees to keep the Work and the site of the Project and all project bonds free and clear of all bond claim and verified claims related to labor and materials furnished in connection with the Work.

j. If the Owner is entitled to reimbursement or payment from the Contractor under or pursuant to the Contract Documents, such payment shall be made promptly upon demand by the Owner. Notwithstanding anything contained in the Contract Documents to the contrary, if the Contractor fails to promptly make any payment due the Owner, or if the Owner incurs any costs and expenses to cure any default of the Contractor or to correct defective Work, the Owner shall have an absolute right to offset such amount against the Contract Sum and may, at the Owner's sole discretion, elect either to (i) deduct an amount equal to that which the Owner is entitled from any payment then or thereafter due the Contractor from the Owner, or (ii) issue a written notice to the Contractor reducing the Contract Sum by an amount equal to that which the Owner is entitled.

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Section 9.7 Failure of Payment

If the Design Professional does not issue a Certificate for Payment, through no fault of the Contractor, within seven (7) days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within the date established in the Contract Documents, the amount certified by the Design Professional, then the Contractor may, upon seven (7) additional days' written notice to the Owner and Design Professional, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

Section 9.8 Substantial Completion

a. "Substantial Completion" is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use, all major systems are operational, and all safety features are completed and Owner's receipt of written confirmation after final inspections by the applicable electrical, plumbing, fire department, health department, and other local and state officials having jurisdiction, stating the project is ready for occupancy by the Owner. In addition to the other requirements of the Contract Documents, and without limitation, the Contractor must also have obtained the written approval and issuance of any occupancy permits required by the laws of local government(s) and the State of Texas before the Contractor shall be deemed to have achieved Substantial Completion.
b. When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Design Professional a comprehensive list of items to be completed or corrected prior to final payment. The Contractor shall proceed promptly to complete and correct items on the list. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. The Contractor will also provide the Design Professional a comprehensive list of all claims previously and properly made in writing and identified by the Contractor as unsettled at the time of Substantial Completion.
c. Upon receipt of the Contractor's list, the Design Professional will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Design Professional's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Design Professional. In such case, the Contractor shall then submit a request for another inspection by the Design Professional to determine Substantial Completion.
d. When the Work or designated portion thereof is substantially complete, the Design Professional will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

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e. The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

f. The Contractor's acceptance of payment per Section 9.8.e shall constitute a waiver for all purposes of all claims or causes of action by the Contractor against the Owner and the Design Professional, except those previously and properly made in writing and identified in the list provided by the Contractor as unsettled at the time of Substantial Completion per Sections 9.8.b.

Section 9.9 Partial Occupancy or Use

a. The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, as such occupancy or use is consented to by the insurer and required under Section 11.3 provided it is authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Design Professional as provided under Section 9.8.b. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Owner.

b. Immediately prior to such partial occupancy or use, the Owner, Contractor, and Design Professional shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

c. Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

Section 9.10 Final Completion and Final Payment

a. Upon receipt of the Contractor's written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Design Professional will promptly make such inspection. When the Design Professional finds the Work acceptable under the Contract Documents and the Contract fully performed, the Design Professional will promptly issue a final Certificate for Payment stating that the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Design Professional's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.b as precedent to the Contractor's being entitled to final payment have been fulfilled. All warranties and guarantees required under Section 3.5 or otherwise required pursuant to the Contract Documents shall be assembled and delivered by the Contractor to the Design Professional as part of the final

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Application for Payment. The final Certificate for Payment will not be issued by the Design Professional until all warranties and guarantees have been received and accepted by the Owner. "Final Completion" occurs when all the conditions of this Section and the Contract Documents are met as set forth herein.

b. Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Design Professional and Owner; (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or Owner's property might be responsible or encumbered (less amounts withheld by the Owner) have been paid or otherwise satisfied; (2) a certificate evidencing that insurance required by the Contract Documents to remain in full force after final payment is currently in effect; (3) a written statement satisfactory to the Owner that the insurance will cover the period required by the Contract Documents; (4) consent of surety to final payment; (5) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract for Construction, to the extent and in such form as may be designated by the Owner and Owner's lender; (6) certification by the Contractor that (i) all Work has been completed in accordance with the Contract Documents, (ii) the final Application for Payment includes all claims of the Contractor against the Owner arising in connection with the Project and constitutes a waiver and release of any and all claims not presented in that application except for claims arising out of third party actions, cross-claims and counterclaims, and (iii) the Record Drawings maintained by the Contractor pursuant to the Contract Documents and delivered to the Owner or Design Professional are complete and accurate in all respects; and (7)evidence of compliance with all requirements of the Contract Documents, such as notices, certificates, affidavits, or other requirements to complete obligations under the Contract Documents, including, but not limited to, (i) instruction of the Owner's representatives in the operation of mechanical, electrical, plumbing, and other systems; (ii) delivery of keys to the Owner with keying schedule (master, submaster, and special keys); (iii) delivery to the Owner of the Contractor's warranties as set forth in the Contract Documents and each written warranty and assignment thereof prepared in duplicate, certificates of inspections, and bonds for the Design Professional's review and delivery to the Owner; (iv) delivery to the Owner of printed operating, servicing, maintenance and cleaning instructions for all Work (parts lists and special tools for mechanical and electrical work) in approved form; (v) delivery to the Owner of the Record Drawings; (vi) delivery to the Owner of a Final Waiver and Release of Liens covering all Work for itself and for each Subcontractor, vendor, and material supplier who furnished labor, materials, and services to the Work, executed by an authorized officer and duly notarized; (vii) delivery to the Owner of final waivers of lien from each subcontractor and material supplier who furnished labor, materials, and services to the Work, executed by their respective officers and duly notarized; and (viii) delivery of sales and use tax certificate number of the Contractor. In addition to the foregoing, all other submissions required by other Articles and Paragraphs of the Specifications and other Contract Documents shall be submitted to the Owner before approval of final payment. If a Subcontractor refuses to furnish a release or waiver required by the Owner and Owner's lender (if any), the Contractor may furnish a bond satisfactory to the Owner and Owner's lender (if any) to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the

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Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and attorneys' fees.

i. In addition to items listed in 9.10.b to be submitted before Final Payment will be made or remaining retainage released, Contractor shall deliver a permanent certificate of occupancy from local authorities having jurisdiction.

c. If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Design Professional so confirms, the Owner shall, upon application by the Contractor and certification by the Design Professional, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Design Professional prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

d. The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

.1 bond claims, Claims, liquidated damages, security interests, or encumbrances arising out of the Contract and unsettled;

.2 failure of the Work to comply with the requirements of the Contract Documents;

.3 terms of special warranties required by the Contract Documents;

.4 audits performed by the Owner, if permitted by the Contract Documents, after final payment; or

.5 gross negligence, willful misconduct, or fraudulent concealment in connection with the performance of the Contract.

e. Application for and acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee against the Owner or Design Professional except those previously made in writing and identified by that payee arising after the waiver given at Substantial Completion payment described in Sections 9.8.b and 9.8.f.

f. In addition to any other damages, failure of the Contractor to achieve final completion within sixty (60) days after the specified date of Substantial Completion, subject to authorized extensions, will result in the Contractor being responsible for excess Design Professional's and other Owner's consultant(s)' fees beyond their original scope of services required to achieve final completion ("Excess Fees"). Excess Fees will be deducted from the amount due the Contractor.

Article 10. PROTECTION OF PERSONS AND PROPERTY

Section 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract. Contractor's and all

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Subcontractors' Safety Programs shall comply with all applicable requirements of the Occupational Safety and Health Act of 1970, and all other applicable state, local, or federal laws or regulations.

Section 10.2 Safety of Persons and Property

a. The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to all of the following:
    .1 employees on the Work and other persons who may be affected thereby;
    .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
    .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.
b. The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.
c. The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards. The Contractor shall also be responsible, at the Contractor’s sole cost and expense, for all measures necessary to protect any property adjacent to the Project and improvements therein. Any damage to such property or improvements shall be promptly repaired by the Contractor.
d. When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel, and the Contractor shall give the Owner and the Design Professional reasonable advance written notice of such planned activities.
e. The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.a.2 and 10.2.a.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.a.2 and 10.2.a.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Design Professional or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor’s obligations under Section 3.18.
f. The Contractor shall designate a responsible member of the Contractor’s organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor’s superintendent unless otherwise designated by the Contractor in writing to the Owner and Design Professional.
g. The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

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h. Injury or Damage to Person or Property
If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

i. The Contractor shall immediately report in writing to the Owner and Design Professional all accidents arising out of or in connection with the Work that cause death, personal injury, or property damage, giving full details and statements of any witnesses. In addition, if death, serious personal injuries, or serious damages are caused, the accident shall be reported immediately electronically, as well as by telephone or messenger to the Owner and the Design Professional.

Section 10.3 Hazardous Materials and Substances

a. Hazardous materials include any material in such quantity, concentration, and physical or chemical characteristics including, but not limited to, ignitability or toxicity, so as to be capable of posing an unreasonable risk to health, safety and/or property if released into the atmosphere, transported, stored, or disposed of. The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Design Professional of the condition in writing.

.1 For the purposes of this section, the following terms have the below meanings (however, each definition should be read as broadly as possible to incorporate similar hazardous materials or substances:

Asbestos: any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

Petroleum: Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), and including but not limited to oil, fuel oil, oil sludge, oil refuse, gasoline, diesel fuel, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.

Hazardous Waste: any solid waste listed as hazardous or which possesses one or more hazardous characteristics.

b. Upon receipt of the Contractor’s written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Design Professional the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or

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substance. The Contractor and the Design Professional will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Design Professional has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Design Professional have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order duly processed and approved, the Contract Time shall be extended appropriately, and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up, both as specified in Article 7. The term "rendered harmless" shall be interpreted to mean, without limitation that levels of hazardous materials, including, but not limited to, asbestos and polychlorinated biphenyls, are less than any applicable exposure standards set forth in OSHA regulations. In no event, however, shall the Owner have any responsibility for any substance or material that is brought to the Project site by the Contractor, any Subcontractor, any material supplier, or any entity for whom any of them is responsible. The Contractor agrees not to use any fill or other materials to be incorporated into the Work that are hazardous, toxic, or made up of any items that are hazardous or toxic.

c. Omitted.

d. The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

e. Omitted.

f. <u>THE CONTRACTOR SHALL INDEMNIFY THE OWNER FOR THE COST AND EXPENSE THE OWNER INCURS (1) FOR REMEDIATION OF A MATERIAL OR SUBSTANCE THE CONTRACTOR BRINGS TO THE SITE AND NEGLIGENTLY HANDLES, OR (2) WHERE THE CONTRACTOR FAILS TO PERFORM ITS OBLIGATIONS UNDER SECTION 10.3.a, EXCEPT TO THE EXTENT THAT THE COST AND EXPENSE ARE DUE TO THE OWNER'S FAULT OR NEGLIGENCE.</u>

Section 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

Section 10.5 Site Visits

Anyone other than the Owner's designated representatives, the Design Professional, the Design Professional's consultants, and the Owner's other consultants visiting the job site who is not employed by a Contractor shall be required to register with the Contractor's site office before proceeding onto the job site.

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Article 11. INSURANCE AND BONDS

Section 11.1 Contractor's Liability Insurance

a. The Contractor shall purchase and maintain in a company or companies lawfully authorized to do business in Texas and as further qualified in Paragraph 11.6, such insurance as will protect the Contractor and the Indemnitees from claims set forth below which may arise out of or result from the Contractor's operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

.1 Claims under workers' compensation, disability benefit and other similar employee benefit acts which are applicable to the Work to be performed; including private entities performing Work at the site and exempt from the coverage on account of number of employees or occupation, which entities shall maintain voluntary compensation coverage at the same limits specified for mandatory coverage for the duration of the Project;

.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees; or persons or entities exempt by statute from the requirements of Section 11.1.a.1, but required by the Contract Documents to provide the insurance required by that Section;

.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;

.4 Claims for damages insured by usual personal injury liability coverage;

.5 Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;

.6 Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle, including pollution clean-up if hauling hazardous materials; and

.7 Claims for bodily injury or property damage arising out of completed operations, which coverage shall be maintained for no less than ten (10) years following final payment.

.8 Claims for damages to the Work, and/or materials and equipment used/stored at the Work, as may be covered under any Builder's Risk insurance policy.

b. The Contractor's Commercial General Liability Insurance should be written on ISO Form CG 00 01 10 01 or its equivalent and provide the following:

.1 Premises/operations (Including X-C-U coverages);

.2 Independent contractors;

.3 Products and completed operations with a per project aggregate limit, which coverage shall be maintained for a period of ten (10) years from the date of the Final Payment;

.4 Personal injury (libel, slander, false arrest) liability with employment exclusion deleted;

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.5 Blanket Contractual, including, but not limited to, a specified provision for the Contractor's obligations under Section 3.18 of the Contract Documents;

.6 Broad form property damage including, but not limited to, completed operations;

.7 Primary and Non-Contributory endorsement in favor of Indemnitees; and

.8 Contain a Waiver of Subrogation in favor of Indemnitees.

c. Professional Errors and Omissions Liability Insurance is required for all licensed and certified professionals, including, but not limited to, contractors, engineers, Design Professionals, design-build and design professionals as follows:

.1 The retroactive date preceding the date of the contract; and

.2 An extended reporting period of three (3) years past substantial completion.

d. Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

e. The Contractor shall, for the protection and benefit of the Indemnitees and the Contractor and as part of the Contractor's efforts to satisfy the obligations set forth in this Article 11, procure, pay for, and maintain in full force and effect, at all times during the performance of the Work until final acceptance of the Work; and for such duration as required in the Contract Documents; policies of insurance issued by a responsible carriers acceptable to the Owner, and in form and substance satisfactory to the Owner, that afford the coverages set forth in the Schedule of Insurance, attached to the Contract and made a part of it as Exhibit "YX" – Contractor's Insurance Certificate(s). All such insurance shall be written on an occurrence basis, with the sole exception of Professional Errors and Omissions Liability Insurance. In the event professional liability coverage is not available on "an occurrence" basis, a "claims made" basis policy with effective and retroactive dates prior to the effective date of the Contract Documents and an extended reporting period of at least three (3) years beyond Substantial Completion or as otherwise required by the Contract Documents, whichever is greater, may be substituted with the written consent and approval of the Owner and Design Professional. The Contractor's completed operations coverage shall be maintained until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

f. The Contractor agrees to deliver to the Design Professional, for transmittal to the Owner with a copy to the Design Professional within ten (10) days of the date of the Owner-Contractor Agreement and prior to bringing any equipment or personnel onto the site of the Work or the Project site, and thereafter upon renewal or replacement of each required policy of insurance, certified copies of all required insurance policies procured by the Contractor under or pursuant to this Article 11 or, with the written consent of the Owner and Design Professional, Certificates of

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Insurance in form and substance satisfactory to the Owner and Design Professional evidencing the required coverages with limits not less than those specified in Section 11.1.k below and all endorsements as required in Article 11 herein. The coverage afforded under any insurance policy obtained under or pursuant to this Section 11.1 shall be primary to any valid and collectible insurance carried separately by any of the Indemnitees. Furthermore, all policies and Certificates of Insurance shall expressly provide that no less than thirty (30) days prior written notice (ten (10) days for non-payment of premium) shall be given the Design Professional and Owner in the event of material alteration, cancellation, nonrenewal or expiration of the coverage contained in such policy or evidenced by such certified copy or Certificate of Insurance. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.b and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.e. Information concerning reduction of coverage shall be furnished by the Contractor with reasonable promptness.

g. Certificates of Insurance with the following or similar wording are not acceptable: "Failure to notify the certificate holder shall impose no obligation or liability of any kind upon the insurer, its agents or representatives."

h. In no event shall any failure of the Design Professional to receive certified copies or certificates of policies required under Paragraph 11.1.f or to demand receipt of such certified copies or certificates prior to the Contractor's commencing the Work be construed as a waiver by the Owner of the Contractor's obligations to obtain insurance pursuant to this Article 11.

i. When any required insurance, due to the attainment of normal expiration date or renewal date, shall expire, the Contractor shall furnish to the Design Professional Certificates of Insurance and amendatory riders or endorsements that clearly evidence the continuation of all coverage in the same manner, limits of protection, and scope of coverage as was provided by the previous policy forty-five (45) days prior to renewal date. In the event any renewal or replacement policy, for whatever reason obtained or required, is written by a carrier other than that with whom the coverage was previously placed, or the subsequent policy differ in any way from the previous policy, the Contractor shall also furnish the Design Professional with a certified copy of the renewal or replacement policy unless the Owner provide the Contractor with prior written consent to submit only a Certificate of Insurance for any such policy. All renewal and replacement policies shall be in form and substance satisfactory to the Owner and Design Professional and written by carriers acceptable to the Owner and Design Professional.

j. Any Aggregate limit under the Contractor's liability insurance, shall by endorsement, apply to this Project separately.

k. The Contractor shall notify the Owner and Design Professional in writing of any reduction in collectible limits (aggregate limits) by an amount in excess of Fifty Thousand Dollars ($50,000), and the Contractor shall promptly procure, at no expense to the Owner, such additional coverage as necessary to restore the valid and collectible limits of such insurance to that required under the Contract Documents.

l. The Contractor shall cause each Subcontractor to procure insurance congruent with the Contractor's insurance requirements as specified in the Contract Documents and satisfactory to the Owner and Design Professional and name each of the Indemnitees as additional insureds under the Subcontractor's commercial general liability, automobile and umbrella excess liability

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policies. The additional insured endorsement included on the Subcontractor's commercial general liability policy shall state that coverage is afforded the additional insureds with respect to claims arising out of all on-going and completed operations performed by or on behalf of the Contractor. Each policy shall contain a Waiver of Subrogation in favor of the Indemnities, provide for forty-five (45) day notice of cancellation or non-renewal, and be primary without contribution if the additional insureds have other insurance that is applicable to the loss. If the additional insureds have other insurance that is applicable to the loss, such other insurance shall be on an excess or contingent basis. The amount of the insurer's liability under this insurance policy shall not be reduced by the existence of such other insurance.

m. The Indemnitees shall also be shown as "Additional Insureds" on the property, commercial general liability, automobile liability and umbrella (excess) liability policies and evidence of same must be included in Certificates of Insurance. Copies of policy endorsements must be provided listing the Indemnities as Additional Insureds, using ISO forms CG2010, CG2037, CA0070, CA0032 or their equivalents, and approved as to form by Owner.
n. A "waiver of subrogation" clause in favor of the Owner will be attached to the workers compensation, commercial general liability, umbrella (excess) liability, automobile and the any applicable property insurance policies and evidence of same must be included in Certificates of Insurance. Copies of policy endorsements must be provided showing waivers of subrogation in favor of the Indemnities using ISO forms CG2404, CA0070, CA0032, WC0003 or their equivalents, and approved as to form by Owner.
o. The Owner reserves the right to review the insurance requirements during the effective period of its Agreement with the Contractor, and provide a written request for the Contractor to make any reasonable and commercially available adjustments to insurance coverages and\or limits when deemed reasonably prudent by the Owner based upon its unilateral interpretation of changes in statutory law, court decisions or the Owner's potential increase in exposure to loss.
p. Neither Contractor, Subcontractor, Sub-subcontractor, nor any of their insurance carrier's liability obligations shall be limited to the minimum limits of coverage of insurance maintained or required to be maintained by the Contract Documents.

Section 11.2 Owner's Liability Insurance

a. The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance.

Section 11.3 Property Insurance

a. The Contractor shall purchase and maintain "builder's risk" property insurance, or comparable coverage, for the full replacement cost value thereof, for (i) the Work that is to be done, (ii) all insurable items of Work, title to which has been acquired by Owner in accordance with the Contract Documents and (iii) all materials to be incorporated in the Work, if such materials are in or upon the Premises, or in transit to Premises, whether or not title has been acquired by Owner. Such insurance shall not cover any property owned, leased, or otherwise used in connection with the Work by Contractor, Contractor's subcontractors or the agents or employees of them, that is not forming a permanent part of the Project. This insurance shall include the interests of Owner, Contractor, and Subcontractors and shall provide coverage against loss for "direct physical damage" (previously known as "all risk" coverage) including, but not limited to, without

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duplication of coverage, fire, extended coverage, vandalism and malicious mischief, theft, collapse, earthquake, flood, sprinkler leakage, windstorm, testing and startup, temporary buildings and debris removal including demolition and increased cost of construction occasioned by enforcement of any applicable legal requirements.

b. Any coverage related to the builder's risk property insurance maintained by Contractor for time including delay in opening and/or extra expenses shall inure to the benefit of Owner only. Owner shall be the only party insured under such policy, with the sole exception that the Contractor may be entitled to payment of its fee and general conditions associated with the reconstruction, less any deductible.
c. The Contractor's insurance shall cover against loss for "direct physical damage" (previously known as "all risk" coverage) with sufficient limits to protect the full replacement cost value of the Work.
d. If by the terms of the property insurance there is a deductible amount, in the event of a loss covered by such insurance, Contractor shall be responsible for all deductibles per occurrence which shall be considered a Cost of the Work for all insurable items of Work and materials to be incorporated in the Work, title to which has not been acquired by Owner in accordance with the Contract Documents. Except for Contractor's deductible risk, Owner is bearing all risk of loss to the Property for which Owner, Contractor, and others have an insurable or financial interest during construction, and, in the event of a loss to the property during construction, Owner agrees to rely solely to the proceeds of the Builder's Risk Insurance which Owner Contractor has agreed to furnish.
e. To the extent permitted by law, Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other, and (2) Owner's Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Section or other property insurance applicable to the Work. Owner or Contractor, as appropriate, shall require of Owner's Separate Contractors, if any, and the subcontractors, sub-subcontractors, agents, and employees of any of them, by written appropriate agreement, similar waivers each in favor of other parties enumerated herein.
f. To the degree allowed by the insurer, Owner and Contractor shall each have its policies endorsed to provide for a waiver of the right of subrogation against the other respective party.
g. Any loss insured pursuant to this Section 11.3 Property Insurance is to be adjusted by Owner and made payable to Owner as trustee for the insureds, as their interests may appear, subject to the requirements of any applicable mortgagee clause. Contractor shall pay each Subcontractor a just share of any insurance monies received by Contractor, and by appropriate written agreement, shall require each Subcontractor to make payments to its Sub-subcontractors in similar manner.
h. Upon request, Owner shall make available for inspection by Contractor a copy of all policies to be furnished by Owner.

Section 11.4 Performance, Maintenance, and Payment Bond

a. The Contractor must furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract. Such bonds shall be issued in an amount equal to the total Contract Sum by a surety company licensed in the state where the

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Project is located, with a current A.M. Best rating of at least A- X, included on the U.S. Treasury Department's listing of approved sureties, and acceptable to the Owner and Design Professional, or as expressly agreed otherwise by the Owner and Design Professional in writing.

.1 Except as otherwise required by statute, the form and substance of such bonds shall be satisfactory to the Owner in the Owner's sole judgment and shall satisfy the requirements Texas Government Code Chapters 2253 and 2269.

.2 The Performance Bond, Maintenance Bond, and the Labor and Material Payment Bond shall each be in an amount equal to the Contract Sum and all subsequent increases.

.3 Every Bond under this Section 11.4.a must display the Surety's Bond Number and a rider including the following provisions, which shall be attached to each Bond:

a) The Surety hereby agrees that it consents to and waives notice of any addition, alteration, omission, change, or other modification of the Contract Documents;

b) Any addition, alteration, change, extension of time, or other modification of the Contract Documents, or a forbearance on the part of either the Owner or the Contractor to the other, shall not release the Surety of its obligations hereunder, and notice to the Surety of such matters is hereby waived; and

c) The Surety agrees that it is obligated under the bonds to any successor, grantee, or assignee of the Owner.

b. Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.
c. The Bond Form shall be in a form provided by the Owner.
d. Additional Performance, Maintenance, and Payment Bonds may be recommended by the Design Professional and required by the Owner, at the Owner's sole discretion, from any Subcontractor. The Owner will pay such actual, additional expenditures as Cost of the Work using the process specified in Article 7 for Changes in the Work. All such bonds shall be in form and substance satisfactory to the Owner and Design Professional.
e. The Contractor shall deliver the required bonds to the Owner no later than three (3) business days following the date of the Agreement is entered into, or if the Work is to be commenced prior to the date the Agreement is entered into, in response to a notification of award. The Contractor shall, prior to the commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished.
f. The Contractor shall require the attorney-in-fact who executes the required bond on behalf of the surety to affix thereto a certified and current copy of the power of attorney.

Section11.5 Adjustment and Settlement of Insured Loss

a. 11.5.1 Omitted.
b. Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have fourteen (14) days from receipt of notice to object to the proposed settlement or

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allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

Section 11.6 Insurance Companies

All insurance coverage procured by the Contractor shall be provided by insurance companies having current policyholder ratings no lower than "A- X" by A.M. Best and acceptable by the Owner and Design Professional, or as expressly agreed otherwise by the Owner, Contractor and Owner in writing. Such companies must be licensed to do business in the State of Texas.

Section 11.7 Failure to Purchase Insurance

If one or more of the Indemnitees, or the Contractor is damaged by the failure of either the Owner or the Contractor to purchase or maintain the insurance required under this Article 11, then the party who failed to purchase or maintain the insurance shall bear all reasonable costs (including attorneys' fees and court and settlement expenses) properly attributable to the failure.

Section 11.8 Insurance Limits Required

The following insurance limits are the minimums to be carried by the Design Professional, the Design Professional's consultants, the Owner's other consultants, the Contractor, and the Subcontractors, Sub-subcontractors, and suppliers, unless higher limits are required by their respective Agreements or Texas law (in which case those limits shall control):

.1 Automobile Liability
$1,000,000 Combined Single Limit

.2 Commercial General Liability
$1,000,000 Aggregate, Per Occurrence and Personal Injury
$2,000,000 General Aggregate
$2,000,000 Products/Completed Operations Aggregate
$1,000,000 Personal and Advertising Injury
$500,000 Fire Damage
$5,000 Medical Payments

.3 Worker's Compensation
Statutory Limits
$1,000,000 Employers Liability

.4 Umbrella or Excess Liability
$10,000,000 Per Occurrence

.5 Contractor's Environmental Impairment/Pollution coverage
$2,000,000 Occurrence or Claim

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$2,000,000 Policy Aggregate

.6 Builder's Risk (where applicable)

100% of the total value of the work

a. Limits for primary policies may differ from those shown when Umbrella or Excess Liability insurance is provided, as long as all coverage is equal to or greater than the minimum limits required herein.

Article 12. UNCOVERING AND CORRECTION OF WORK

Section 12.1 Uncovering of Work

a. If a portion of the Work is covered contrary to the Design Professional's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Design Professional, be uncovered for the Design Professional's examination and be replaced at the Contractor's expense without change in the Contract Time.

b. If a portion of the Work has been covered that the Design Professional has not specifically requested to examine prior to its being covered, the Design Professional may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

Section 12.2 Correction of Work

a. Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Design Professional or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, specifically including but not limited to additional testing and inspections, the cost of uncovering and replacement; the cost of any additional supervision, material, labor, equipment, rental charges, home office overhead, and other expenditures necessitated to both rectify the non-complying conditions, protect adjacent Work of both the Contractor and the Project, and restore Work by the Contractor and others necessarily damaged in the course of rectifying the non-complying conditions; as well as compensation for the Design Professional's services and expenses made necessary thereby, shall be at the Contractor's expense.

i. If prior to the date of Substantial Completion the Contractor, a Subcontractor, or anyone for whom either is responsible uses or damages any portion of the Work, including, without limitation, mechanical, electrical, plumbing, and other building systems, machinery, equipment, or other mechanical device, the Contractor shall cause such item to be restored to "like new" condition at no expense to the Owner. In addition, the Contractor shall promptly remedy damage and loss arising in conjunction with the Project caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, supplier, or anyone directly or indirectly employed by any of them, or anyone for whose acts they may be liable or for which the Contractor is otherwise responsible.

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b. After Substantial Completion

i. In addition to the Contractor's obligations under Section 3.5, if, within two years after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.a, or by terms of any applicable special warranty required by the Contract Documents, or within such longer period of time as may be prescribed by law, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. If the condition is reasonably discoverable, during the two-year period for correction of Work, and the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Design Professional, the Owner may correct it in accordance with Section 2.5, and charge the reasonable costs to the Contractor.

ii. The two-year period for correction of Work shall also be extended by the period of time between Substantial Completion and the actual completion of the corrective Work performed by the Contractor pursuant to this Section 12.2, but only with respect to the corrected portions of the Work.

iii. Omitted.

c. Omitted.

d. The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents. These costs specifically include, but are not limited to such additional supervision, material, labor, equipment rental charges, home office overhead, and other expenditures necessitated to rectify the non-complying conditions, protect adjacent Work, and restore Work by the Contractor and others necessarily damaged in the course of rectifying the non-complying conditions.

e. Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.b relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

f. The Contractor's obligations under this Section 12.2 shall, without limitation, survive acceptance of the Work under the Contract and termination of the Contract.

Section 12.3 Acceptance of Nonconforming Work

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If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made. In the event final payment has been made by the Owner subsequent to accepting such non-conforming Work, the Contractor shall pay the Owner for the reduction in the Contact Sum occasioned by such acceptance.

Article 13. MISCELLANEOUS PROVISIONS

Section 13.1 Governing Law

The Contract shall be governed by the laws of the state of Texas. Venue on any dispute arising out of this Contract shall be in Denton County, Texas, which is the place where the Project is located and where performance is primarily to occur.

Section 13.2 Successors and Assigns

a. The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to the covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.b, neither party to the Contract shall assign the Contract, or any rights under the contract, in whole or in part without the written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.
b. The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.
c. Written Notice
   Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at or sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice.

Section 13.3 Rights and Remedies

a. Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.
b. No action or failure to act by the Owner, Design Professional, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

Section 13.4 Quality Management Tests and Inspections

a. Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or

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lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Design Professional timely notice of when and where tests and inspections are to be made so that the Design Professional may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require. As required by the provisions of Texas Government Code, Section 2269.058(a), the Owner shall provide or contract for the construction materials engineering, testing, and inspection services and the verification testing services necessary for acceptance of the facility by the Owner. To the extent that any of the provisions of this Section 13.4 or other provisions of this Agreement conflict with any of the provisions of Section 2269.058(a) such conflict is unintentional, and the provisions of the Texas Government Code shall control.

b. If the Design Professional, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.a, the Design Professional will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Design Professional of when and where tests and inspections are to be made so that the Design Professional may be present for such procedures. Such costs, except as provided in Section 13.4.c, shall be at the Owner's expense.
c. If such procedures for testing, inspection, or approval under Sections 13.4.a and 13.4.b reveal failure of the portions of the Work to comply with requirements established by the Contract Documents ("Failed Work"), all costs made necessary by the Failed Work, including those of repeated procedures and compensation for the Design Professional's services and expenses and all costs specified in Section 12.2 shall be at the Contractor's expense. The Contractor also agrees all costs of testing, inspection, and approval services required for the correction of the Failed Work and the cost of such similar services related to remedial operations performed to the Failed Work shall be borne by the Contractor.
d. Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Design Professional.
e. If the Design Professional is to observe tests, inspections, or approvals required by the Contract Documents, the Design Professional will do so promptly and, where practicable, at the normal place of testing.
f. It is the intent of the Construction Documents to require the Contractor to control the quality of the Work using the processes specified in the Contractor's Quality Management, Commissioning, and Turnover Plan contained within the most recent Construction Management Plan approved by the Owner and Design Professional. Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work and shall conform to the most recently approved Contractor's Construction Schedule.

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g. The responsibility for implementing the Quality Management, Commissioning and Turnover Plan is the Contractor's, as is the obligation to provide the Work and a complete and functional project per the Contract Documents. Notwithstanding anything herein, or in subsequently approved Quality Management, Commissioning and Turnover Plans, the Owner's review and Design Professional's approval of such plan(s) does not relieve the Contractor in any way of this responsibility.

h. The Contractor shall be in charge of scheduling; re-scheduling (when required); and confirming adequate distribution of reports and other findings from all testing and inspections of the Work. This responsibility includes, but is not limited to, scheduling the testing services of a certified testing laboratory which, by statute shall be contracted to and paid for by the Owner. The certified testing laboratory shall be acceptable to the Design Professional; and shall perform the tests as called for in the Contract Documents. The conditions that apply to materials testing and inspections include, but are not limited to the following:

.1 The frequency and type of Quality Control testing shall be established by the Contractor and shall be sufficient to insure the delivery of the Work and a complete and functional project per the Contract Documents. The type and amount of testing required by the Contract Documents shall be seen as the minimums required, and shall be increased, if in the opinion of the Contractor, more testing is needed to meet the requirements of the Contractor.

.2 The Contractor shall concurrently provide the Design Professional copies of all test results it receives within three (3) business days of receipt of same.

.3 The Owner shall provide such Quality Assurance testing as it and the Design Professional mutually agree to be adequate for their own needs. The Owner shall distribute the results of its own Quality Assurance tests as it, at its sole discretion, deems appropriate. The provision of Quality Assurance testing by the Owner, or lack thereof shall in no manner affect the responsibilities of the Contractor or Design Professional under this Agreement.

i. The Contractor shall facilitate and conduct weekly (or more frequent if necessary) meetings on site for the coordination of all mechanical, electrical and special systems installation activities and possible interference(s) above ceilings, in mechanical rooms, etc. The mechanical trades shall typically have preference in the event of conflicts, and therefore the mechanical contractor's coordinator will usually lead each meeting, unless the Contractor decides another trade or the Contractor should take the lead. The Design Professional shall be informed of the meetings at least seven (7) days in advance, and the appropriate Design Professional's consultants should be invited to attend by the Contractor, as supplemented and coordinated by the Design Professional.

j. The Contractor's Quality Management, Commissioning and Turnover Plan shall specify that prior to completion and acceptance of any building system or phase, consistent with the Contract and applicable codes and Contractor will review, in detail, the steps for completing testing of all building systems with the Owner and Design Professional. This plan shall be coordinated with and shall be made part of the Contractor's Construction Schedule. All testing shall be of each complete system, before covering, or of individually separable larger portions of each system and shall be performed in the presence of the appropriate Owner's and Design Professional's consultant(s), representatives of the Owner, and at its option, either or both the Design Professional.

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k. When heating, air conditioning, ventilating, exhaust, or other items of mechanical, electrical or other similar equipment are installed, or other systems or equipment requiring testing as may be specified in the Contractor's Quality Management, Commissioning and Turnover Plan, it shall be the responsibility of the Contractor, Subcontractor or Sub-subcontractor installing such equipment to operate it for a period of time satisfactory to the Owner prior to acceptance and before the start of Warranty. The duration of such operation shall be as the Owner, Owner's consultant(s), Design Professional's consultant(s), Owner' employees and other Owner's representatives (the Turnover Team) shall reasonably require for proper testing of the respective system and thorough instruction of the Owner's operating personnel.

l. All equipment, testing instruments, instruction materials and incidentals required for proper testing of such systems and thorough instruction of the Owner's operating personnel on each system's operations and maintenance shall be provided by the Contractor, Subcontractor or Sub-subcontractor responsible for providing and installing the equipment. Such tests and instruction shall be in meetings held solely for this purpose (the Turnover Meetings), which shall be coordinated and managed by the Contractor, who shall show their dates in the Contractor's Construction Schedule at least sixty (60) days prior to occurrence. The Contractor shall schedule the Turnover Meetings at times reasonably convenient for the Owner's consultant(s), Design Professional's consultant(s), Owner's employees and other Owner's representatives that the Owner and Design Professional agree are necessary to attend for each system. The Design Professional may attend such Turnover Meetings at its discretion.

m. The Contractor shall provide a digital video record to the Owner, with copies to the Design Professional of all meetings for the purpose of Owner operational staff instruction or training; as well as commissioning of equipment. These videos will become a permanent part of all Operations and Maintenance manuals as applicable.

n. The Contractor shall prepare a digital video record of the project for the Owner with copies to the Design Professional at such stages as shall be indicated by the Design Professional for the purpose of documenting the location of piping, conduit, equipment, or other construction to be concealed at a later date; recording key inspections and tests; providing evidence of unforeseeable conditions encountered by the Contractor on site; and other construction issues as the Design Professional may reasonably require from time to time.

o. The Contractor shall layout and mark any plantings, shrubs and trees which will require removal a minimum of five (5) business days prior to their removal. The Contractor shall notify the Design Professional in writing immediately upon completion of this marking, and the Design Professional will have the location of these marked plantings, shrubs and trees reviewed and approved (if correct) by the Owner. The Design Professional will then give permission for removal in writing to the Contractor. Plantings, shrubs, and trees shall not be removed or damaged without such permission.

Section 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest as set forth in the provisions of Texas Government Code, Chapter 2251 or its successor statute.

Section 13.6 Time Limits on Claims

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The Owner and Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time period specified by applicable law, but in any case not more than ten (10) years after the date of Substantial Completion of the Work.

Section 13.8 Measurement

Before ordering any material or doing any Work, the Contractor shall verify all measurements for Work completed at the Project and shall be responsible for their accuracy. Any differences found shall be submitted to the Design Professional for consideration before proceeding with the Work. The Contractor shall use its utmost efforts to identify discrepancies in dimensions in a timely fashion and notify the Owner and Design Professional of these prior to commencing any Work affected by the ambiguous dimensions. No extra charge or compensation shall be allowed because of differences between actual measurements and the dimensions indicated on the drawings.

Section 13.9 Expediting Materials

The Contractor shall immediately, after receipt of Notice to Proceed and approval of the list of subcontractors and material suppliers, place orders for all equipment, materials, and supplies required for the Work, and shall submit to the Design Professional evidence that such orders have been placed in accordance with the Contractor's Construction Schedule.

Section 13.10 Addressing the Owner's Additional Needs and Concerns

a. Notwithstanding the above, the Owner has a unique set of stakeholders and organizational structure that creates special challenges the Contractor must completely and successfully address to the satisfaction of the Owner and Design Professional in the performance of the Work under this Agreement. The actions that shall be taken to address these special challenges include, but are not limited to, the following:

    .1 The Contractor shall provide the Superintendent once per month for a scheduled meeting with the Owner for a progress update on the project if requested by the Owner. A walk-through of the site may be held as a part of this meeting, which shall be scheduled by mutual agreement during regular business hours.

    .2 The Contractor may be required to provide the Superintendent for one meeting per month with the Design Professional for the purpose of assisting the Owner in preparing City Council agenda items and assisting City staff in preparing presentations to the City Council for the benefit of the public. The actual preparation and submission of the City Council of any agenda or work session item shall be performed by the Owner.

    .3 In addition to the meetings required to complete the Project, it is anticipated the Owner may request tours from time to time of the project and the site. The Contractor shall indicate in writing when such activity will be permitted and when the site is off limits. These requirements shall be coordinated through the Owner.

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Section 13.11 Additional Provisions

a. In the event that any provision herein is held to be unlawful, against public policy, or a violation of the Charter or Ordinances of the Denton City, Texas, such provision shall be modified to make it valid, or if modification is not possible, such provision shall be deleted and the remainder of this Agreement shall remain in full force and effect.

b. Each party hereto agrees to, without limitation, perform all acts; provide all services, material, equipment, labor and supervision; and to make, execute, and deliver such written instruments, as shall from time to time be reasonably required to carry out the terms and provisions of the Contract Documents.

c. All exhibits referred to in the Contract Documents are, by reference, incorporated herein for all purposes.

d. The captions of the paragraphs are set forth only for convenience and reference, and are not intended in any way to define, limit, or describe the scope or intent of the Contract Documents.

e. Any specific requirement in this Contract that require responsibilities or obligations of the Contractor also apply to a Subcontractor is added for emphasis and is also hereby deemed to include a Subcontractor, Sub-subcontractor or supplier of any tier. The omission of a reference to a Subcontractor in connection with any of the Contractor's responsibilities or obligations shall not be construed to diminish, abrogate, or limit any responsibilities or obligations of a Subcontractor, Sub-subcontractor or supplier of any tier under the Contract Documents or the applicable subcontract.

f. The provisions of the Contract Documents shall not be changed, amended, waived, or otherwise modified in any respect except by a written document signed by Owner. No person is authorized on behalf of Owner to orally change, amend, waive, or otherwise modify the terms of the Contract Documents or any of the Contractor's duties or obligations under or arising out of the Contract Documents. Any change, waiver, approval, or consent granted to the Contractor shall be limited to the specific material restated in the written document signed by Owner and shall not relieve Contractor of any other of the duties and obligations under the Contract Documents.

g. The Contractor shall provide and file, as required by law, all notices required or permitted by the laws of the state in which the Project is located for protection of Owner from liens and claims of lien if permitted or required by applicable law. Contractor shall be responsible for filing in the appropriate court or other governmental office records all such notices as required or permitted by the laws of the state in which the Project is located.

h. The Contractor shall provide Owner with copies of all notices received by Contractor from Subcontractors, Sub-subcontractors, and/or suppliers to Contractor.

i. The Owner is a Texas home-rule municipality and as such is generally exempt from taxation under Texas law, which may include the purchase of items, materials, or supplies purchased on behalf of the Owner for this public works project. Contractor shall confirm that the Owner is exempt before paying taxes for items, materials, or supplies that may not be lawfully charged to the Owner.

j. Owner affirmatively represents that its governing body has duly appropriated such sums which are equal to or in excess of the contract amount, and that such contract amount may be lawfully paid by Owner to Contractor subject to the terms and conditions of the Contract Documents. In the event that Owner approves a Change Order, Construction Change Directive or other additional compensable Work to be performed by Contractor, (other than that contemplated by

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the Contract Documents under any remedy-granting provision), Owner will issue a written assurance at the time of such approval that such additional compensation to be paid has also been duly appropriated by the Owner's governing body.

k. In the event the Owner is required to further advertise the completion of the Work or the Project under any local, state or Federal law, the Contractor shall notify the Owner and Design Professional of such requirement(s) in writing not less than thirty (30) days in advance and attach a copy of the specific advertising and noticing required.

l. The Contractor shall, in addition to compliance with the requirements of Section 3.7.f and without limitation, not knowingly employ or contract with an illegal alien to perform any of the Work under this Agreement. The Contractor shall not knowingly contract with a Subcontractor that (i) knowingly employs or contracts with an illegal alien to perform work under this Agreement or (ii) fails to certify to the Contractor that the Subcontractor will not knowingly employ or contract with an illegal alien to perform work under this Agreement.

   i. The Contractor shall comply with any reasonable request of the Texas Workforce Commission made in the course of an investigation pursuant to state law.

   ii. In addition to any other legal or equitable remedy, and notwithstanding anything to the contrary in the Contract Document the Owner may be entitled to for a breach of the Agreement, if the Owner terminates this Agreement, in whole or in part, due to Contractor's breach of the obligations set forth above in this Section 13.11.l Contractor shall be liable for actual and consequential damages to the Owner.

m. It is the express intention of the parties that this Agreement is not to be construed as a waiver of any immunities or defenses of the Owner under Texas law.

n. Notwithstanding any other provision in the Contract Documents to the contrary, public property is protected from forced sale and therefore may not be made the subject of a mechanic's lien. Nothing in the Contract Documents shall be construed to allow a mechanic's lien on public property owned by the Owner. The Owner does not waive its immunities or right to object to or contest such a lien.

Article 14. TERMINATION OR SUSPENSION OF THE CONTRACT

Section 14.1 Termination by the Contractor

a. The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

   .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped; or

   .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped.

b. The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100

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percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

c. If one of the reasons described in Section 14.1.a or 14.1.b exists, the Contractor may, upon seven (7) days' notice to the Owner and Design Professional, terminate the Contract and recover from the Owner payment for Work executed, including other costs allowed by the law.

d. If the Work is stopped for a period of sixty (60) consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' written notice to the Owner and the Design Professional, terminate the Contract and recover from the Owner as provided in Section 14.1.c.

Section 14.2 Termination by the Owner for Cause

a. The Owner may terminate the Contract if the Contractor:

.1 refuses or fails to supply enough properly skilled workers or proper materials;

.2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;

.3 disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority;

.4 otherwise is guilty of substantial breach of a provision of the Contract Documents; or

.5 contractor becomes insolvent or makes a general assignment for the benefit of its creditors.

b. When any of the reasons described in Section 14.2.a exist, and upon certification by the Design Professional that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

.1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;

.2 Accept assignment of subcontracts pursuant to Section 5.4; and

.3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

c. When the Owner terminates the Contract for one of the reasons stated in Section 14.2.a, the Contractor shall not be entitled to receive further payment.

d. If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Design Professional's, Design Professional's consultants', and Owner's other consultants' services and expenses made necessary thereby, and other damages incurred by

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the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

i. The costs of finishing the Work include, without limitation, all reasonable attorneys' fees, additional title costs, insurance, additional interest because of any delay in completing the Work, and all other direct and indirect costs incurred by the Owner by reason of the termination of the Contractor as stated herein.

Section 14.3 Suspension by the Owner for Convenience

a. The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.
b. The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.a. Adjustment of the Contract Sum shall be as specified in Article 7. No adjustment shall be made to the extent:
    .1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
    .2 that an equitable adjustment is made or denied under another provision of the Contract.

Section 14.4 Termination by the Owner for Convenience

a. The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.
b. Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall:
    .1 cease operations as directed by the Owner in the notice;
    .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
    .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.
c. Upon such termination for the Owner's convenience, the Contractor shall recover as its sole remedy payment for Work properly performed in connection with the terminated portion of the Work prior to the effective date of termination and for items properly and timely fabricated off the Project site, delivered and stored in accordance with the Contract Documents and Owner's further instructions. **The Contractor waives and forfeits all other claims for payment and damages, including, without limitation, anticipated profits, lost opportunity costs, and potential and actual unabsorbed overhead costs.** The Owner shall be credited for (1) payments previously made to the Contractor for the terminated portion of the Work; (2) claims that the Owner has against the Contractor under the Contract; and (3) the value of the materials, supplies, equipment, or other items that are to be disposed of by the Contractor that are part of the Contract.

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Article 15. CLAIMS AND DISPUTES

Section 15.1 Claims

a. Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.a does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

b. Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the dispute resolution method selected in the Agreement and within the period specified by applicable law.

c. Notice of Claims

Claims by either the Owner or Contractor must be initiated by written notice to the other party and to the Initial Decision Maker with a copy sent to the Design Professional, if the Design Professional is not serving as the Initial Decision Maker.; provided, however, that the claimant shall use its best efforts to furnish the Initial Decision Maker and the other party, as expeditiously as possible, with notice of any Claim including, without limitation, those in connection with concealed or unknown conditions, once such claim is recognized, and shall cooperate with the Design Professional and the party against whom the claim is made in any effort to mitigate the alleged or potential damages, delay, or other adverse consequences arising out of the condition that is the cause of such a Claim. Claims by either party must be initiated within twenty-one (21) days after occurrence of the event giving rise to such Claim or within twenty-one (21) days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

i. Claims Made After Final Payment

After Final Payment, Claims made by the Contractor that have not otherwise been waived pursuant to this Contract, must be initiated within one hundred and eighty (180) days from the date of Final Payment by written notice to the Owner as a condition precedent to the Contractor's right to sue on the Contract.

ii. Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.b, shall be initiated by notice to the other party. In such event, no recommendation by the Initial Decision Maker is required.

d. Continuing Contract Performance

i. Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

ii. The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance

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with this Article 15. The Design Professional will prepare Change Orders and issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

e. Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.c shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4. Damages available to the Contractor are limited to those set forth in the Texas Local Government Code, Subchapter I, Section 271.153 or its successor statute(s).

f. Claims for Additional Time

i. If the Contractor wishes to make a Claim for an increase in the Contract Time, the Contractor shall provide written notice as required by Sections 8.3.d. and 8.3.e.

ii. If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented in accordance with Section 8.3.e.

g. Waiver of Claims for Consequential Damages

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

.1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

.2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.g shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

Section 15.2 Initial Decision

Omitted.

Section 15.3 Mediation

a. Claims, disputes, or other matters in controversy arising out of or related to the Contract shall be subject to mediation as a condition precedent to precedent to filing suit in a state district court having competent jurisdiction per the Contract Documents. If a statute of limitations is at issue, then suit may be filed by either party to toll the statute, but the suit shall then be stayed pending completion of the agreed mediation. If the parties cannot agree on a mediator, then the court may appoint one upon application of either party.

b. The parties shall endeavor to resolve their Claims by mediation. A request for mediation, shall be made in writing, delivered to the other party to the Contract.

c. Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a

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demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings.

d. The parties shall share the mediator's fee equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Written agreement(s) reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

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SECTION 00 73 01
SUPPLEMENTARY CONDITIONS - CSP
TO
GENERAL CONDITIONS

Supplementary Conditions

These Supplementary Conditions modify and supplement Section 00 72 00 - General Conditions, and other provisions of the Contract Documents as indicated below. All provisions of the General Conditions that are modified or supplemented remain in full force and effect as so modified or supplemented. All provisions of the General Conditions which are not so modified or supplemented remain in full force and effect.

Defined Terms

The terms used in these Supplementary Conditions which are defined in the General Conditions have the meaning assigned to them in the General Conditions, unless specifically noted herein.

Modifications and Supplements

The following are instructions that modify or supplement specific paragraphs in the General Conditions and other Contract Documents.

SC-1.01 "Defined Terms"

The following Terms are added to the General Conditions as follows:

Competitive Sealed Proposals – A procurement method by which a governmental entity requests proposals, evaluates and ranks the Offerors, and negotiates a contract with a general contractor for the construction, rehabilitation, alteration, or repair of a facility.

Daily Value – The City-determined value in dollars as indicated in the Proposal Form as the value of one Day for the purposes of determining the Incentive (if applicable) for Substantial Completion relative to the Contract Time and achievement of Substantial Completion.

Weekend Working Hours—Those hours between 8:00 a.m. and 8:30 p.m. on Saturday, and between 1:00 p.m. and 8:30 p.m. on Sunday or on a federal or state holiday observed by the City, as approved in advance by the City for performing Work.

Working Day—Defined as a Business Day but excluding any days that weather or other conditions beyond the reasonable control of the Contractor prevents the performance of the principal unit of work underway for a continuous period of not less than 7 hours between 7:00 a.m. and 8:00 p.m.

SC-2.01

Easement limits shown on the Drawings are approximate and were provided to establish a basis for proposals. Upon receiving the final easements descriptions, Contractor shall compare them to the lines shown on the Contract Drawings.

SC-2.01A., "Availability of Lands"

The following is a list of known outstanding right-of-way, and/or easements to be acquired, if any as of February 26, 2025.

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Outstanding Right-Of-Way, and/or Easements to Be Acquired

PARCEL NUMBER	OWNER	TARGET DATE OF POSSESSION
None		

The Contractor understands and agrees that the dates listed above are estimates only, are not guaranteed, and do not bind the City.

If Contractor considers the final easements provided to differ materially from the representations on the Contract Drawings, Contractor shall within five (5) Business Days and before proceeding with the Work, notify City in writing associated with the differing easement line locations.

SC-2.01B., "Availability of Lands"
Utilities or obstructions to be removed, adjusted, and/or relocated

The following is the list of utilities and/or obstructions that have not been removed, adjusted, and/or relocated as of May 15,2024.

EXPECTED OWNER	UTILITY AND LOCATION	TARGET DATE OF ADJUSTMENT
None		

The Contractor understands and agrees that the dates listed above are estimates only, are not guaranteed, and do not bind the City.

SC-3.01, "Subsurface and Physical Conditions"

The following are reports of explorations and tests of subsurface conditions at the site of the Work:

A Geotechnical Report will be provided for each project detailing information on soil and site conditions.

SC-4.01, "Underground Facilities

The following are additional resources for identification of Underground Facilities which are at or contiguous to the site of the Work, and which are not necessarily shown in the Drawings:
None

SC-5.01, "Hazardous Environmental Conditions at Site"

The following are reports and drawings of existing hazardous environmental conditions known to the City:
None

SC-6.01, "Certificates of Insurance"

The entities listed below are "additional insureds as their interest may appear" including their respective officers, directors, agents and employees.

(1) City
(2) Consultant: *None*
(3) Other: *None*

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SC-7.01, "Concerning Subcontractors and Suppliers"

The following subcontractors shall be required to be utilized by the Contractor for specific portions of the Work as indicated below:

Required Subcontractors

SUBCONTRACTOR COMPANY NAME	DESCRIPTION OF WORK TO BE PERFORMED
None	

SC-8.01., "Permits and Utilities"

SC-8.01A., "Contractor obtained permits and licenses"

The following are known permits and/or licenses required by the Agreement to be acquired by the Contractor: *None*

SC-8.01B. "City obtained permits and licenses"

The following are known permits and/or licenses required by the Agreement to be acquired by the City:

1. TxDOT Permit
2. Railroad Permit
3. ROW Permit

SC-8.01C. "Outstanding permits and licenses"

The following is a list of known outstanding permits and/or licenses to be acquired, if any as of May 15, 2024:

Outstanding Permits and/or Licenses to Be Acquired

OWNER	PERMIT OR LICENSE AND LOCATION	TARGET DATE OF POSSESSION
None		

SC-10.01, "Coordination"

The individuals or entities listed below have contracts with the City for the performance of other work at the various site projects:

Vendor	Scope of Work	Coordination Authority
Raba Kistner	Geotechnical Testing	City of Denton

SC-11.01, "Communications to Contractor"

Contractor must coordinate concrete testing, soil compaction, and other tests needed with City of Denton's Geotechnical Engineering Firm.

SC-12.01, "City's Project Manager"

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The City's Project Manager for this Contract is Mark Zimmerer, or his/her successor pursuant to **written notification from the City Engineer.**

SC-13.01, "Tests and Inspections"

Contractor must coordinate concrete testing, soil compaction, and other tests needed with City of Denton's Geotechnical Engineering Firm.

SC-14.01, "Methods and Procedures"

None

SC – 15.01, "Documents"

Any documents submitted to the City in electronic format shall be considered equivalent to an original of such document.

SC – 16.01 "Labor; Working Hours"

1. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.

2. Contractor shall be fully responsible to City for all acts and omissions of Contractor's employees; of Suppliers and Subcontractors, and their employees; and of any other individuals or entities performing or furnishing any of the Work, just as Contractor is responsible for Contractor's own acts and omissions.

3. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours on Business Days. Contractor will not permit the performance of Work outside of regular working hours on Business Days without City's prior written consent (which will not be unreasonably withheld)). Contractor's written request (by letter or electronic communication) for City's written consent must be made as follows:

    a. for Work beyond regular working hours on Business Days, request must be made by noon at least two (2) Business Days prior;

    b. for Work during Weekend Working Hours, request must be made by noon of the preceding Wednesday; and

    c. for Work on state or federal holidays observed by the City, request must be made sufficiently in advance of the holiday, to satisfy requirements for City Council approval.

SC-17.01, "Indefinite Delivery/Indefinite Quantity"

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The Parties acknowledge that this Contract is for an Indefinite Delivery/Indefinite Quantity (IDIQ) that will be used on an as-needed basis. Any reference to schedules, work, or other project specific provisions throughout the Contract Documents shall refer to the specifications set out in each individual project task order issued by the City of Denton for each such individual project.

END OF SECTION

Revision Log		
DATE	**NAME**	**SUMMARY OF CHANGE**

Docusign Envelope ID: 45D94101-DFDA-4D99-8A65-B405DB143A78

EXHIBIT B
DRAWINGS AND SPECIFICATIONS; ON FILE WITH THE PURCHASING AGENT

Docusign Envelope ID: 45D94101-DFDA-4D99-8A65-B405DB143A78

EXHIBIT C

KEY PERSONNEL RESUME FORM

Offerors may attach an organizational chart (maximum of 1 page) as supporting documentation. Please list the key team members that will be assigned to the Project. The Offeror should, at a minimum, provide personnel experience for the Project Manager, Superintendent, and the Foreman/Foremen. Past experience projects should demonstrate experience in the categories listed in 12.2.2.7 of Section 00 21 16 – Instructions to Offerors.

NAME: John Reil

JOB TITLE: General Superintendant

LICENSES AND CERTIFICATIONS: Training in Medium Voltage Terminations

TOTAL YEARS OF EXPERINCE: 15

TOTAL YEARS WITH CURRENT FIRM: 3

RELEVANT EXPERIENCE WITHIN LAST 5YRS., INCLUDE PROJECT ROLES AND RESPONSIBILITIES.

IDENTIFY IF PROJECTS WERE COMPLETED WITH CURRENT OR PREVIOUS FIRM:

Full on-site responsibility for construction of electrical Transmission Lines up to 345kV

Responsible for supervision of employees

Installation of electrical systems

Termination of high & low voltage

Layouts/Planning

Employee Safety

Notable Projects:

Hilltop to W. Weatherford 138kV Transmission Line - current firm

Finn to Oakland 161kV Line Construction - current firm

LIST OTHER ACTIVE PROJECTS FOR THE DURATION OF THIS PROJECT AND INCLUDE PERCENTAGE OF TIME ALLOCATED FOR EACH: NA

Docusign Envelope ID: 45D94101-DFDA-4D99-8A65-B405DB143A78

NAME: Curtis Hardin
JOB TITLE: General Foreman

LICENSES AND CERTIFICATIONS: OSHA 30, Trained in Medium Voltage Terminations

TOTAL YEARS OF EXPERINCE: 24

TOTAL YEARS WITH CURRENT FIRM: 3

RELEVANT EXPERIENCE WITHIN LAST 5YRS., INCLUDE PROJECT ROLES AND RESPONSIBILITIES.

IDENTIFY IF PROJECTS WERE COMPLETED WITH CURRENT OR PREVIOUS FIRM:

Full on-site responsibility for construction of electrical Transmission Lines up to 345kV

Responsible for supervision of employees

Installation of electrical systems

Termination of high & low voltage

Layouts/Planning

Employee Safety

Notable Projects:

Hilltop to W. Weatherford 138kV Transmission Line - current firm

Finn to Oakland 161kV Line Construction - current firm

LIST OTHER ACTIVE PROJECTS FOR THE DURATION OF THIS PROJECT AND INCLUDE PERCENTAGE OF TIME ALLOCATED FOR EACH: NA

NAME: Corey Lieberth
JOB TITLE: President of Operations

LICENSES AND CERTIFICATIONS: Journeyman Electrician, Class A CDL, OSHA 30, 510, 500 Trainings

TOTAL YEARS OF EXPERINCE: 28

TOTAL YEARS WITH CURRENT FIRM: 12

RELEVANT EXPERIENCE WITHIN LAST 5YRS., INCLUDE PROJECT ROLES AND RESPONSIBILITIES.

IDENTIFY IF PROJECTS WERE COMPLETED WITH CURRENT OR PREVIOUS FIRM:

Estimate/Bid projects

Procure project material and write subcontracts for projects

PM multiple projects simultaneously

Check bills of material against electrical plans and specifications to ensure correct order entry

Docusign Envelope ID: 45D94101-DFDA-4D99-8A65-B405DB143A78

Complete managed project schedukes, coordinated deliveries between multiple vendors

Manage submittal process in coordination with electrical contractors and consulting engineers

Negotiate project change orders and schedule changes

Manage and run projects in the fields

Notable Projects: Blazing Star 2 Transmission Line, 345kV Bonilla Interconnect Project,

345kV Solomon Forks Transmission Line, 500kV Olinda and Maxwell Structure Rebuilds - Current Firm

LIST OTHER ACTIVE PROJECTS FOR THE DURATION OF THIS PROJECT AND INCLUDE PERCENTAGE OF TIME ALLOCATED FOR EACH: 15%

NAME: Robert Eckert

JOB TITLE: Project Manager

LICENSES AND CERTIFICATIONS: First Aid, Adult CPR, OSHA 30 Training

TOTAL YEARS OF EXPERINCE: 9

TOTAL YEARS WITH CURRENT FIRM: 1

RELEVANT EXPERIENCE WITHIN LAST 5YRS., INCLUDE PROJECT ROLES AND RESPONSIBILITIES.

IDENTIFY IF PROJECTS WERE COMPLETED WITH CURRENT OR PREVIOUS FIRM:

PM multiple projects simultaneously

Solicit and review subcontracts for projects

Procure project material and write subcontracts for projects

Check bills of material against electrical plans and specifications to ensure correct order entry

Complete and manage project schedules, coordinated deliveries between multiple vendors

Manage submittal process in coordination with electrical contractors and consulting engineers

Negotiate project change orders and schedule changes

Manage and run projects in the fields

LIST OTHER ACTIVE PROJECTS FOR THE DURATION OF THIS PROJECT AND INCLUDE PERCENTAGE OF TIME ALLOCATED FOR EACH: 20%

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NAME: Marcus Majewski

JOB TITLE: Project Manager

LICENSES AND CERTIFICATIONS: OSHA 10 Training, OSHA 30 Training

TOTAL YEARS OF EXPERINCE: 9

TOTAL YEARS WITH CURRENT FIRM: 1

RELEVANT EXPERIENCE WITHIN LAST 5YRS., INCLUDE PROJECT ROLES AND RESPONSIBILITIES.

IDENTIFY IF PROJECTS WERE COMPLETED WITH CURRENT OR PREVIOUS FIRM:

PM multiple projects simultaneously

Solicit and review subcontracts for projects

Procure project material and write subcontracts for projects

Check bills of material against electrical plans and specifications to ensure correct order entry

Complete and manage project schedules, coordinated deliveries between multiple vendors

Manage submittal process in coordination with electrical contractors and consulting engineers

Negotiate project change orders and schedule changes

Manage and run projects in the fields

Notable Projects: Petersburd BESS, Chillingham BESS, Flat Ridge Wind Farm

Substation 4&5, Wagon Wheel Wind Farm Substations A&B

LIST OTHER ACTIVE PROJECTS FOR THE DURATION OF THIS PROJECT AND INCLUDE PERCENTAGE OF TIME ALLOCATED FOR EACH: 30%

Docusign Envelope ID: 45D94101-DFDA-4D99-8A65-B405DB143A78

John Reil

Professional Profile

Core Competencies

- Electrical Systems & Controls
- Installations & Maintenance
- Switches & Circuit Breakers
- Generators & Transformers
- Electrical Code
- Wiring Diagrams
- Trained in Medium Voltage Terminations
- Transmission Power Construction
- Tower Lines

Professional Experience

Integrated Power Company, Highlands Ranch, CO
General Superintendent/Current

Responsibilities:

- Full on-site responsibility for construction of electrical Transmission lines up to 345kV
- Responsible for supervision of employees
- Installation of electrical systems
- Termination of high & low voltage
- Layouts/Planning
- Employee Safety

Notable Projects:

- Hilltop to W. Weatherford 138kV Transmission Line
- Finn to Oakwood 161kV Line Construction

RES
General Superintendent/ 5 years

Responsibilities:

- Responsible for supervision of employees
- Layouts/Planning
- Employee Safety
- Taking Outages
- Manage Equipment

Docusign Envelope ID: 45D94101-DFDA-4D99-8A65-B405DB143A78

PLS
Superintendent/2 Years

Responsibilities:

- Flying structures into remote areas not accessible by truck
- Material management
- Terminations of high & low voltage
- Employee Safety

Team Power Group
Operator, Lineman,
and Foreman /5 Years

Responsibilities:

- Employee Safety
- Production Reports
- Set Poles. Sag, Clip, and Deadend Wire
- Heavy Equipment
- Responsible for supervision of employees

Docusign Envelope ID: 45D94101-DFDA-4D99-8A65-B405DB143A78

Curtis Hardin

Professional Profile

Core Competencies

- OSHA 30
- Electrical Systems & Controls
- Installations & Maintenance
- Switches & Circuit Breakers
- Electrical Code
- Wiring Diagrams
- Trained in Medium Voltage Terminations
- Transmission Power Construction
- Tower Lines

Professional Experience

Integrated Power Company

General Foreman/Current

Responsibilities:

- Full on-site responsibility for construction of electrical Transmission lines up to 345kV
- Responsible for supervision of employees
- Installation of electrical systems
- Termination of high & low voltage
- Layouts/Planning
- Employee Safety

Notable Projects:

- Hilltop to W. Weatherford 138kV Transmission Line
- Finn to Oakwood 161kV Line Construction

Great Plains Construction, LLC.
Heavy Equipment Operator/ 1 years

Responsibilities:

- Heavy Equipment
- Civil Work
- Final Grade Work
- GPS Dozer, Skid steer and Scraper

Docusign Envelope ID: 45D94101-DFDA-4D99-8A65-B405DB143A78

Malonska
Superintendent/2 Years

Responsibilities:

- Time Scheduler
- Track Job Costs and Reports
- Material management
- Terminations of high & low voltage
- Employee Safety

RES
Superintendent/2Years

Responsibilities:

- Employee Safety
- Production Reports
- Ordering Material
- Responsible for supervision of employees

Team Power
Superintendent/5 Years

Responsibilities:

- Supervise Crew
- Time Scheduler
- Track Job Costs and Reports
- Material management
- Terminations of high & low voltage
- Employee Safety
- Tracking Time Sheets

PLS
Foreman/1 Years

Responsibilities:

- Heavy Equipment
- Equipment Setting
- Oversaw Framing
- Supervise Crew
- Time Scheduler
- Track Job Costs and Reports
- Material management
- Terminations of high & low voltage
- Employee Safety
- Tracking Time Sheets

C & H

Docusign Envelope ID: 45D94101-DFDA-4D99-8A65-B405DB143A78

Foreman/10 Years

Responsibilities:

- Heavy Equipment
- Coordinated with Supervisor
- Supervise Crew
- Material management
- Employee Safety

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Corey Lieberth

Professional Profile

Core Competencies

- Electrical Estimating
- Project Management
- Certified Aluminum Welder
- Medium Voltage Electrical Distribution
- Journeyman Electrician
- Electrical Construction
- Low Voltage Switchgear
- Class A CDL
- OHSA 30 Training
- OSHA 510 Training
- OSHA 500 Trainer Course

Professional Experience

Integrated Power Company, Highlands Ranch, CO
President of Operations

Responsibilities:

- Estimate/Bid projects
- Procure project material and write subcontracts for projects.
- PM multiple projects simultaneously
- Check bills of material against electrical plans and specifications to ensure correct order entry
- Complete and managed project schedules, coordinated deliveries between multiple vendors
- Manage the submittal process in coordination with electrical contractors and consulting engineers
- Negotiate project change orders and schedule changes
- Manage and run projects in the field
- Notable Projects
    - Blazing Star 2 Transmission Line
    - 138kV Rio Grande Substation
    - 138kV Trimmier to Ding Dong Transmission Line Rebuild
    - 345kV Bonilla Interconnect Project
    - 115/69kV/13.2kV Colfer Substation
    - 230kV Mead Substation Stage 16
    - 500kV Olinda and Maxwell Structure Rebuilds
    - 345kV Solomon Forks Transmission Line
    - 230/115/69kV Southeast and Wadsworth Substations

IES Commercial Inc.
Estimator/Project Manager /5 Years

Responsibilities:

- Estimated/Bid projects
- Procured project material and wrote subcontracts for projects
- PM multiple projects simultaneously
- Checked bills of material against electrical plans and specifications to ensure correct order

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entry
- Completed and managed project schedules, coordinated deliveries between multiple vendors
- Managed the submittal process in coordination with electrical contractors and consulting engineers
- Negotiated project change orders and schedule changes
- Performed daily field operations with the crew and equipment to build substations in a safe and orderly manner
- Notable Projects
    - Meadow Grove 230kv Switchyard
    - NPPD 115kv Switchyard w/ 30) 115kv switches & 15) 115kv Bkrs
    - NPPD Axtell 345kv addition
    - NPPD Grand Island 230kv addition
    - Notrees TX 161kv Substation.
    - Army Core Of Engineers Gavin's Point Dam 115kv BKR change out

Substation Apprentice-Field Manager/Superintendent/8 Years

Responsibilities:
- Built 12, 69, 161, 230, and 345 KV substations Work consisted of but not limited to the following: installing conduit & grounding, steel erecting, pulling wire, and wiring control panels, control houses , transformers ,breakers, ct's, pt.'s, ccvt's, lighting circuits. Installing switches. Bending and installing 3/4"- 5" bus. Installing cable trays. Switching out transformer and breakers. Reading prints, holding clearances and work permits. Terminating 5-35kv underground cable.
- Can operate 5-60ton cranes, boom trucks, man baskets, fork lifts, back hoes, Excavators, Trenchers, Loaders, Skid-steers, etc.

River Valley Distributing
Route Diver/1 Year

Responsibilities:
- Delivered & sold Budweiser products to convenience stores, liquor stores etc.
- Was responsible for stocking shelves, customer interaction, procuring and handling of payments

IES Commercial Inc./2 Years
Substation & Electrical Apprentice/2 Years

Responsibilities:
- Work consisted of building 12 and 69kv substations, airport lighting, commercial construction, and Industrial construction.

Education

- **Graduated North Platte High School**
- **Mid-plains Community College (HVAC): did not complete course**

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Marcus Majewski

Professional Profile

Core Competencies

- T&D Estimating
- Civil Estimating
- Project Management
- OHSA 10 Training
- OHSA 30 Training

Professional Experience

Integrated Power Company, North Platte, NE
Project Management

Responsibilities:

- PM multiple projects simultaneously.
- Solicit and review subcontractor quotes
- Procure project material and write subcontracts for projects.
- Check bills of material against electrical plans and specifications to ensure correct order entry.
- Complete and manage project schedules, coordinated deliveries between multiple vendors.
- Manage the submittal process in coordination with electrical contractors and consulting engineers.
- Negotiate project change orders and schedule changes.
- Manage and run projects in the field.
- Notable Projects
    - Petersburg BESS
    - Chillingham BESS
    - Flat Ridge Wind Farm Substation 4&5
    - Wagon Wheel Wind Farm Substations A&B

Phillips and Jordan
Estimator/Project Manager /2 Years

Responsibilities:

- Estimated/Bid projects
- Solicit and review subcontractor quotes
- Procured project material and wrote subcontracts for projects
- PM multiple projects simultaneously
- Checked bills of material against electrical plans and specifications to ensure correct order entry
- Completed and managed project schedules, coordinated deliveries between multiple vendors
- Managed the submittal process
- Negotiated project change orders and schedule changes
- Notable Projects
    - Banner Elk Transmission Line
    - Leeds – Gaston Long Haul Fiber

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Radtke Contractors
Estimator/Project Manager /2 Years

Responsibilities:

- Estimated/Bid projects
- PM multiple projects simultaneously.
- Solicit and review subcontractor quotes
- Procure project material and write subcontracts for projects.
- Check bills of material against electrical plans and specifications to ensure correct order entry.
- Complete and manage project schedules, coordinated deliveries between multiple vendors.
- Manage the submittal process in coordination with electrical contractors and consulting engineers.
- Negotiate project change orders and schedule changes.
- Manage and run projects in the field.
- Notable Projects
    - County Road Y
    - Greenwood Rd.
    - Miller Park Landing and Parking Lot
    - The Wit apartment complex
    - St. Johns Church Parking Lot

Michels Power/4 Years
Estimator

Responsibilities:

- Estimated/Bid projects
- Solicit and review subcontractor quotes

Education

- **Marian University - Bachelor's in Finance**
- **School of Infantry – United States Marine Corp.**

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EXHIBIT D

Alternates

NONE

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EXHIBIT E

ALLOWANCES

None

Docusign Envelope ID: 45D94101-DFDA-4D99-8A65-B405DB143A78

SECTION 00 42 44 - UNIT PRICE PROPOSAL FORM - CSP

To:

EXHIBIT F

City of Denton - Capital Projects
901-B Texas Street
Denton, TX 76209
<Purchasing Agent>/Purchasing Dept.

From: Integrated Power Company
2100 E. 4th Street
North Platte, NE 69103
Joshua Dezort
(970)556-8873
jdezort@ip-co.net

PROJ.: **Transmission Line Maintenance and Construction**

RFP: CSP 8776

ENG PMO: <ENG PMO No. if applicable>

OFFEROR'S APPLICATION - UNIT PRICE PROPOSAL

Item No.	Spec. Section No.	Description	UOM	BID QTY	Unit Price	Extended Price
		Construction Unit				
1		TPS-138DC - DC TANGENT BR POST 0-2 DEG (1-POLE) (EMBEDDED) (<= 100') (< 40K LBS)	EA	1	$ 6,935.00	$ 6,935.00
2		TPS-138DC - DC TANGENT BR POST 0-2 DEG (1-POLE) (EMBEDDED) (> 100') (< 40K LBS)	EA	24	$ 7,076.00	$ 169,824.00
3		TPS-138DCX - DC TANGENT BR POST 0-2 DEG W/ 2ND SW DE (1-POLE) (ON PIER) (<= 100') (< 40K LBS)	EA	1	$ 7,076.00	$ 7,076.00
4		TPS-138DCX - DC TANGENT BR POST 0-2 DEG W/ 2ND SW DE (1-POLE) (ON PIER) (> 100') (< 40K LBS)	EA	1	$ 7,640.00	$ 7,640.00
5		TUS-2DC - DC SMALL ANGLE BR POST 2-10 DEG (1-POLE) (ON PIER) (<= 100') (< 40K LBS)	EA	1	$ 7,358.00	$ 7,358.00
6		TUS-2DC - DC SMALL ANGLE BR POST 2-10 DEG (1-POLE) (ON PIER) (> 100') (< 40K LBS)	EA	1	$ 7,499.00	$ 7,499.00
7		TUS-7GA - DC DEADEND 20-40 DEG (1-POLE) (ON PIER) (<= 100') (< 40K LBS)	EA	2	$ 8,486.00	$ 16,972.00
8		TUS-7GA - DC DEADEND 20-40 DEG (1-POLE) (ON PIER) (> 100') (< 40K LBS)	EA	1	$ 8,909.00	$ 8,909.00
9		TUS-7GAX - DC DEADEND 20-40 DEG (1-POLE) (ON PIER) (<= 100') (< 40K LBS)	EA	1	$ 8,909.00	$ 8,909.00
10		TUS-7GX - DC DEADEND TANGENT (1-POLE) (ON PIER) (<= 100') (< 40K LBS)	EA	2	$ 7,781.00	$ 15,562.00
11		TUS-7A - DC DEADEND 90-100 DEG (2-POLE) (ON PIERS) (<= 100') (< 40K LBS EA)	EA	1	$ 14,126.00	$ 14,126.00
12		TUS-7A - DC DEADEND 90-100 DEG (2-POLE) (ON PIERS) (> 100') (< 40K LBS EA)	EA	1	$ 141,831.00	$ 141,831.00
13		TUS-7A - DC DEADEND 90-100 DEG (1-POLE) (ON PIER) (<= 100') (< 40K LBS EA)	EA	1	$ 7,781.00	$ 7,781.00
14		TUS-7A - DC DEADEND 90-100 DEG (1-POLE) (ON PIER) (> 100') (< 40K LBS EA)	EA	1	$ 8,909.00	$ 8,909.00
15		TUS-2AU - SC SMALL ANGLE BR POST 2-10 DEG (1-POLE) (EMBEDDED) (<= 100') (< 40K LBS)	EA	46	$ 7,076.00	$ 325,496.00
16		TPS-138U - SC TANGENT BR POST 0-2 DEG (1-POLE) (EMBEDDED) (W/UNDERBUILD)	EA	180	$ 7,922.00	$ 1,425,960.00
17		TPS-138U-XS - SC TANGENT BR POST 0-2 DEG (1-POLE) (EMBEDDED) (W/UNDERBUILD)	EA	1	$ 8,627.00	$ 8,627.00
18		TPS-138U-XT - SC TANGENT BR POST 0-2 DEG (1-POLE) (ON PIER) (W/UNDERBUILD)	EA	17	$ 8,204.00	$ 139,468.00
19		TUS-3AU - SC MED ANGLE 10-20 DEG (1-POLE) (ON PIER) (W/UNDERBUILD)	EA	1	$ 8,204.00	$ 8,204.00
20		TUS-4AU - SC LARGE ANGLE 20-40 DEG (1-POLE) (ON PIER) (W/UNDERBUILD)	EA	1	$ 8,063.00	$ 8,063.00
21		TUS-5AAU-2 - SC DEADEND 60-80 DEG (1-POLE) (ON PIER) (W/UNDERBUILD)	EA	2	$ 8,768.00	$ 17,536.00
22		TUS-5AU - SC DEADEND 80-100 DEG (1-POLE) (ON PIER) (W/UNDERBUILD)	EA	46	$ 9,050.00	$ 416,300.00
23		1.5 TUS-5AU - SC DEADEND 90 DEG W/ TAP (1-POLE) (ON PIER) (W/UNDERBUILD)	EA	9	$ 9,191.00	$ 82,719.00
24		TUS-SWT-1U - SC DEADEND INLINE 1-WAY SWITCH (1-POLE) (ON PIER) (W/UNDERBUILD)	EA	7	$ 10,178.00	$ 71,246.00
25		TPS-138DCU - DC TANGENT BR POST 0-2 DEG (1-POLE) (EMBEDDED) (W/UNDERBUILD)	EA	8	$ 10,460.00	$ 83,680.00
26		TUS-2DCU - DC SMALL ANGLE BR POST 2-10 DEG (1-POLE) (ON PIER) (W/UNDERBUILD)	EA	1	$ 8,345.00	$ 8,345.00
27		TUS-7GAU - DC DEADEND 20-40 DEG (1-POLE) (ON PIER) (W/UNDERBUILD)	EA	1	$ 8,191.00	$ 8,191.00
28		TUS-7GAU-2 - DC DEADEND 40-60 DEG (1-POLE) (ON PIER) (W/UNDERBUILD)	EA	4	$ 8,473.00	$ 33,892.00
29		TUS-7GAU-3 - DC DEADEND 60-80 DEG (1-POLE) (ON PIER) (W/UNDERBUILD)	EA	1	$ 8,896.00	$ 8,896.00
30		TUS-7GU - DC DEADEND 80-100 DEG (1-POLE) (ON PIER) (W/UNDERBUILD)	EA	16	$ 9,050.00	$ 144,800.00
31		TUS-7GXU - DC DEADEND TANGENT (1-POLE) (ON PIER) (W/UNDERBUILD)	EA	1	$ 10,037.00	$ 10,037.00
32		INSTALL WOOD POLE (EMBEDDED) (W/UNDERBUILD)	EA	1	$ 4,543.00	$ 4,543.00
33		INSTALL WOOD POLE (EMBEDDED) (NO UNDERBUILD))	EA	1	$ 4,115.00	$ 4,115.00
34		INSTALL 138KV TRANSMISSION RISER STRUCTURE (OVERHEAD TO UNDERGROUND) (ON PIER) (HORIZONTAL TERMINATIONS) (<125')	EA	3	$ 12,434.00	$ 37,302.00
35		INSTALL 138KV TRANSMISSION RISER STRUCTURE (OVERHEAD TO UNDERGROUND) (ON PIER) (VERTICAL TERMINATIONS) (<	EA	1	$ 14,126.00	$ 14,126.00
		Total				$ 3,290,877.00
		Foundation Construction Units				
36		ASSEMBLING AND ERECTING STRUCTURE WEIGHING IN EXCESS OF 40,000 LBS (PER LB OVER 40,000 LBS)	PER STR	8	$ 15,280.00	$ 122,240.00
37		ASSEMBLING AND ERECTING STRUCTURE WEIGHING IN EXCESS OF 40,000 LBS (PER LB OVER 40,000 LBS)	LB	25000	$ 0.50	$ 12,500.00
38		FOUNDATION - CONCRETE FOR ANCHOR BOLT CAGE	PER CY	7880	$ 803.00	$ 6,327,640.00
39		FOUNDATION - CONCRETE FOR DIRECT EMBEDDED POLE	PER CY	1746	$ 237.00	$ 413,802.00
40		FOUNDATION - REINFORCING STEEL PER 1,000 LBS	PER 1K LBS	213.3	$ 1,400.00	$ 298,620.00
41		SLURRY PROCESSING OF FOUNDATION HOLES	PER CY	20	$ 664.00	$ 13,280.00
42		ROCK DRILLING, PER CUBIC YARD	PER CY	200	$ 550.00	$ 110,000.00
43		CASING, 48" DIA, INSTALL AND REMOVE PER LINEAR FOOT	PER FT	4	$ 125.00	$ 500.00
44		CASING, 60" DIA, INSTALL AND REMOVE PER LINEAR FOOT	PER FT	4	$ 155.00	$ 620.00
45		CASING, 72" DIA, INSTALL AND REMOVE PER LINEAR FOOT	PER FT	4	$ 185.00	$ 740.00
46		CASING, 84" DIA, INSTALL AND REMOVE PER LINEAR FOOT	PER FT	4	$ 215.00	$ 860.00
47		CASING, 96" DIA, INSTALL AND REMOVE PER LINEAR FOOT	PER FT	4	$ 250.00	$ 1,000.00
48		CASING, 108" DIA, INSTALL AND REMOVE PER LINEAR FOOT	PER FT	4	$ 310.00	$ 1,240.00
49		CASING, 120" DIA, INSTALL AND REMOVE PER LINEAR FOOT	PER FT	4	$ 370.00	$ 1,480.00
50		CASING, 48" DIA, INSTALL AND LEAVE IN PLACE PER LINEAR FOOT	PER FT	12	$ 234.00	$ 2,808.00
51		CASING, 60" DIA, INSTALL AND LEAVE IN PLACE PER LINEAR FOOT	PER FT	12	$ 312.00	$ 3,744.00
52		CASING, 72" DIA, INSTALL AND LEAVE IN PLACE PER LINEAR FOOT	PER FT	12	$ 781.00	$ 9,372.00
53		CASING, 84" DIA, INSTALL AND LEAVE IN PLACE PER LINEAR FOOT	PER FT	12	$ 546.00	$ 6,552.00
54		CASING, 96" DIA, INSTALL AND LEAVE IN PLACE PER LINEAR FOOT	PER FT	12	$ 624.00	$ 7,488.00
55		CASING, 108" DIA, INSTALL AND LEAVE IN PLACE PER LINEAR FOOT	PER FT	12	$ 858.00	$ 10,296.00
56		CASING, 120" DIA, INSTALL AND LEAVE IN PLACE PER LINEAR FOOT	PER FT	12	$ 1,092.00	$ 13,104.00
		Total				$ 7,357,886.00
		Wire / Assembly Installation Units				
57		SHIELD WIRE - 3/8'' EHS STEEL, 7-STRAND (< 0.5 MI)	PER 1K FT	31.2	$ 1,848.00	$ 57,657.60
58		SHIELD WIRE - 3/8'' EHS STEEL, 7-STRAND (> 0.5 MI)	PER 1K FT	4	$ 1,954.00	$ 7,816.00
59		SHIELD WIRE - OPGW AFL DNO-8168 (0.691") (< 0.5 MI)	PER 1K FT	123.16	$ 2,272.00	$ 279,821.79
60		SHIELD WIRE - OPGW AFL DNO-8168 (0.691") (> 0.5 MI)	PER 1K FT	8	$ 2,378.00	$ 19,024.00
61		CONDUCTOR - (1) 795 ACSR "DRAKE" (< 0.5 MI)	PER 1K FT	40	$ 3,672.00	$ 146,880.00
62		CONDUCTOR - (1) 795 ACSR "DRAKE" (> 0.5 MI)	PER 1K FT	381.5	$ 3,996.00	$ 1,524,474.00
63		CONDUCTOR - (1) 959.6 ACSS/TW/HS "SUWANEE" (< 0.5 MI)	PER 1K FT	40	$ 4,104.00	$ 164,160.00
64		CONDUCTOR - (1) 959.6 ACSS/TW/HS "SUWANEE" (> 0.5 MI)	PER 1K FT	3.6	$ 4,212.00	$ 15,163.20
65		CONDUCTOR - (2) 959.6 ACSS/TW/HS "SUWANEE" (< 0.5 MI)	PER 1K FT	200	$ 6,440.00	$ 1,288,000.00
66		CONDUCTOR - (2) 959.6 ACSS/TW/HS "SUWANEE" (> 0.5 MI)	PER 1K FT	745.6	$ 6,536.00	$ 4,873,241.60
67		CONDUCTOR - (1) 1926.9 ACSS/TW/HS "CUMBERLAND" (< 0.5 MI)	PER 1K FT	40	$ 4,104.00	$ 164,160.00
68		CONDUCTOR - (1) 1926.9 ACSS/TW/HS "CUMBERLAND" (> 0.5 MI)	PER 1K FT	3.6	$ 4,212.00	$ 15,163.20
69		CONDUCTOR - (2) 1926.9 ACSS/TW/HS "CUMBERLAND" (< 0.5 MI)	PER 1K FT	200	$ 6,440.00	$ 1,288,000.00
70		CONDUCTOR - (2) 1926.9 ACSS/TW/HS "CUMBERLAND" (> 0.5 MI)	PER 1K FT	745.6	$ 6,536.00	$ 4,873,241.60
71		CONDUCTOR - (1) 795 AAC "ARBUTUS"	PER 1K FT	32	$ 3,456.00	$ 110,592.00
72		CONDUCTOR - (1) 556 AAC "Mistletoe"	PER 1K FT	11	$ 3,072.00	$ 33,792.00
73		CONDUCTOR - (1) 795 ACSR "DRAKE" (< 0.5 MI) (STRINGING NEXT TO ENERGIZED CIRCUIT)	PER 1K FT	40	$ 4,212.00	$ 168,480.00
74		CONDUCTOR - (1) 795 ACSR "DRAKE" (> 0.5 MI) (STRINGING NEXT TO ENERGIZED CIRCUIT)	PER 1K FT	23	$ 4,428.00	$ 101,844.00
75		CONDUCTOR - (1) 959.6 ACSS/TW/HS "SUWANEE" (< 0.5 MI) (STRINGING NEXT TO ENERGIZED CIRCUIT)	PER 1K FT	40	$ 4,428.00	$ 177,120.00
76		CONDUCTOR - (1) 959.6 ACSS/TW/HS "SUWANEE" (> 0.5 MI) (STRINGING NEXT TO ENERGIZED CIRCUIT)	PER 1K FT	40	$ 4,644.00	$ 185,760.00
77		CONDUCTOR - (2) 959.6 ACSS/TW/HS "SUWANEE" (< 0.5 MI) (STRINGING NEXT TO ENERGIZED CIRCUIT)	PER 1K FT	40	$ 7,236.00	$ 289,440.00
78		CONDUCTOR - (2) 959.6 ACSS/TW/HS "SUWANEE" (> 0.5 MI) (STRINGING NEXT TO ENERGIZED CIRCUIT)	PER 1K FT	40	$ 7,452.00	$ 298,080.00
79		CONDUCTOR - (1) 1926.9 ACSS/TW/HS "CUMBERLAND" (< 0.5 MI) (STRINGING NEXT TO ENERGIZED CIRCUIT)	PER 1K FT	40	$ 4,428.00	$ 177,120.00
80		CONDUCTOR - (1) 1926.9 ACSS/TW/HS "CUMBERLAND" (> 0.5 MI) (STRINGING NEXT TO ENERGIZED CIRCUIT)	PER 1K FT	40	$ 4,644.00	$ 185,760.00
81		CONDUCTOR - (2) 1926.9 ACSS/TW/HS "CUMBERLAND" (< 0.5 MI) (STRINGING NEXT TO ENERGIZED CIRCUIT)	PER 1K FT	40	$ 7,236.00	$ 289,440.00
82		CONDUCTOR - (2) 1926.9 ACSS/TW/HS "CUMBERLAND" (> 0.5 MI) (STRINGING NEXT TO ENERGIZED CIRCUIT)	PER 1K FT	40	$ 7,452.00	$ 298,080.00

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Item No.	Spec. Section No.	Description	UOM	BID QTY	Unit Price	Extended Price
83		SHIELDWIRE SUSPENSION ASSEMBLY - 3/8'' EHS STEEL	EA	2	$ 49.00	$ 98.00
84		SHIELDWIRE SINGLE COMPRESSION DEADEND ASSEMBLY - 3/8'' EHS STEEL	EA	32	$ 122.00	$ 3,904.00
85		SHIELDWIRE DOUBLE COMPRESSION DEADENED ASSEMBLY - 3/8'' EHS STEEL	EA	16	$ 97.00	$ 1,552.00
86		SHIELDWIRE SINGLE MECHANICAL DEADEND ASSEMBLY - 3/8'' EHS STEEL	EA	80	$ 97.00	$ 7,760.00
87		SHIELDWIRE DOUBLE MECHANICAL DEADENED ASSEMBLY - 3/8'' EHS STEEL	EA	40	$ 146.00	$ 5,840.00
88		CONDUCTOR BRACED POST ASSEMBLY - (2) 959.6 ACSS\TW\HS "SUWANEE"	EA	153	$ 318.00	$ 48,654.00
89		CONDUCTOR BRACED POST ASSEMBLY - (1) 1926.9 ACSS/TW/HS "CUMBERLAND"	EA	153	$ 282.00	$ 43,146.00
90		CONDUCTOR BRACED POST ASSEMBLY - (2) 1926.9 ACSS/TW/HS "CUMBERLAND"	EA	153	$ 318.00	$ 48,654.00
91		CONDUCTOR BRACED POST ASSEMBLY - (1) 795 ACSR "DRAKE" OR (1) 959.6 ACSS\TW\HS "SUWANEE"	EA	40	$ 282.00	$ 11,280.00
92		CONDUCTOR HORIZONTAL POST INSULATOR JUMPER ASSEMBLY - (2) 959.6 ACSS\TW\HS "SUWANEE"	EA	48	$ 353.00	$ 16,944.00
93		CONDUCTOR HORIZONTAL POST INSULATOR JUMPER ASSEMBLY - (1) 795 ACSR "DRAKE" OR (1) 959.6 ACSS\TW\HS "SUWANEE"	EA	18	$ 282.00	$ 5,076.00
94		CONDUCTOR HORIZONTAL POST INSULATOR JUMPER ASSEMBLY - (1) 1926.9 ACSS/TW/HS "CUMBERLAND"	EA	20	$ 282.00	$ 5,640.00
95		CONDUCTOR HORIZONTAL POST INSULATOR JUMPER ASSEMBLY - (2) 1926.9 ACSS/TW/HS "CUMBERLAND"	EA	40	$ 353.00	$ 14,120.00
96		CONDUCTOR VERTICAL POST INSULATOR JUMPER ASSEMBLY - (2) 959.6 ACSS\TW\HS "SUWANEE"	EA	78	$ 423.00	$ 32,994.00
97		CONDUCTOR VERTICAL POST INSULATOR JUMPER ASSEMBLY - (1) 795 ACSR "DRAKE" OR (1) 959.6 ACSS\TW\HS "SUWANEE"	EA	9	$ 353.00	$ 3,177.00
98		CONDUCTOR VERTICAL POST INSULATOR JUMPER ASSEMBLY - (1) 1926.9 ACSS/TW/HS "CUMBERLAND"	EA	10	$ 282.00	$ 2,820.00
99		CONDUCTOR VERTICAL POST INSULATOR JUMPER ASSEMBLY - (2) 1926.9 ACSS/TW/HS "CUMBERLAND"	EA	30	$ 353.00	$ 10,590.00
100		CONDUCTOR COMPRESSION DEADEND ASSEMBLY - (2) 959.6 ACSS\TW\HS "SUWANEE"	EA	672	$ 846.00	$ 568,512.00
101		CONDUCTOR COMPRESSION DEADEND ASSEMBLY - (1) 795 ACSR "DRAKE" OR (1) 959.6 ACSS\TW\HS "SUWANEE"	EA	508	$ 423.00	$ 214,884.00
102		CONDUCTOR COMPRESSION DEADEND ASSEMBLY - (1) 1926.9 ACSS/TW/HS "CUMBERLAND"	EA	500	$ 423.00	$ 211,500.00
103		CONDUCTOR COMPRESSION DEADEND ASSEMBLY - (2) 1926.9 ACSS/TW/HS "CUMBERLAND"	EA	700	$ 846.00	$ 592,200.00
104		CONDUCTOR COMPRESSION ANGLE ASSEMBLY - (2) 959.6 ACSS\TW\HS "SUWANEE"	EA	40	$ 846.00	$ 33,840.00
105		CONDUCTOR COMPRESSION ANGLE ASSEMBLY - (2) 1926.9 ACSS/TW/HS "CUMBERLAND"	EA	40	$ 846.00	$ 33,840.00
106		CONDUCTOR SUBSTATION JUMPER WITH COMPRESSION TERMINAL FOR (2) 959.6 ACSS/TW/HS "SUWANEE"	EA	36	$ 987.00	$ 35,532.00
107		CONDUCTOR SUBSTATION JUMPER COMPRESSION TEE TAP FOR (2) 959.6 ACSS/TW/HS "SUWANEE"	EA	24	$ 1,058.00	$ 25,392.00
108		CONDUCTOR SUBSTATION JUMPER WITH COMPRESSION TERMINAL FOR (2) 1926.9 ACSS/TW/HS "CUMBERLAND"	EA	36	$ 987.00	$ 35,532.00
109		CONDUCTOR SUBSTATION JUMPER COMPRESSION TEE TAP FOR (2) 1926.9 ACSS/TW/HS "CUMBERLAND"	EA	24	$ 987.00	$ 23,688.00
110		CONDUCTOR MECHANICAL DEADEND ASSEMBLY - (1) 1926.9 ACSS/TW/HS "CUMBERLAND"	EA	12	$ 423.00	$ 5,076.00
111		CONDUCTOR MECHANICAL DEADEND ASSEMBLY - (1) 795 ACSR "DRAKE" OR (1) 959.6 ACSS\TW\HS "SUWANEE"	EA	12	$ 423.00	$ 5,076.00
112		CONDUCTOR MECHANICAL DEADEND ASSEMBLY - (1) 795 AAC "ARBUTUS"	EA	12	$ 423.00	$ 5,076.00
113		CONDUCTOR MECHANICAL DEADEND ASSEMBLY - (1) 556 AAC "MISTLETOE"	EA	12	$ 423.00	$ 5,076.00
114		OPGW SUSPENSION ASSEMBLY - AFL DNO-8186 (0.691")	EA	17	$ 146.00	$ 2,482.00
115		OPGW DOUBLE SUSPENSION ASSEMBLY - AFL DNO-8168 (0.691")	EA	12	$ 194.00	$ 2,328.00
116		OPGW SINGLE DEADEND ASSEMBLY - AFL DNO-8168 (0.691")	EA	50	$ 194.00	$ 9,700.00
117		OPGW DOUBLE DEADEND ASSEMBLY ASSEMBLY - AFL DNO-8168 (0.691")	EA	97	$ 267.00	$ 25,899.00
118		OPGW FLOATING DEADEND ASSEMBLY - AFL DNO-8168 (0.691")	EA	12	$ 244.00	$ 2,928.00
119		OPGW DOWNLEADS AND COIL BRACKET - AFL DNO-8168 (0.691")	EA	22	$ 1,165.00	$ 25,630.00
120		OPGW COIL WIRE AND INSTALL SPLICE ENCLOSURE	EA	22	$ 970.00	$ 21,340.00
121		SPLICE FIBER OPTIC CABLE - 72 FIBER COUNT	EA	48	$ 5,184.00	$ 248,832.00
122		GROUNDING - CONCRETE DRILLED PIER FOUNDATION	EA	109	$ 805.00	$ 87,745.00
123		GROUNDING - DIRECT EMBED FOUNDATION	EA	245	$ 644.00	$ 157,780.00
124		GROUNDING - ADDITIONAL GROUNDING ASSEMBLY ON NEW STRUCTURE	EA	8	$ 203.00	$ 1,624.00
125		GROUNDING - FIELD REPLACEMENT ON EXISTING STRUCTURE	EA	100	$ 203.00	$ 20,300.00
126		MEGGAR EXISTING GROUNDS PER STRUCTURE	EA	50	$ 141.00	$ 7,050.00
127		GUY WIRE AND MULTI-HELIX SCREW ANCHOR ASSEMBLY	EA	6	$ 291.00	$ 1,746.00
128		GUY WIRE AND CONCRETE ANCHOR ASSEMBLY	EA	6	$ 388.00	$ 2,328.00
129		BIRD DETERRENT PER CIRCUIT (ON STRUCTURE)	EA	10	$ 243.00	$ 2,430.00
130		MARKER BALLS ON SHIELDWIRE OR CONDUCTOR (IN SPAN, FROM GROUND)	EA	18	$ 440.00	$ 7,920.00
131		CONDUCTOR STOCKBRIDGE VIBRATION DAMPERS - 795 ACSR "DRAKE" OR 959.6 ACSS/TW/HS "SUWANEE"	EA	20	$ 35.00	$ 700.00
132		CONDUCTOR STOCKBRIDGE VIBRATION DAMPERS - 1926.9 ACSS/TW/HS "CUMBERLAND"	EA	20	$ 35.00	$ 700.00
133		SHIELDWIRE SPIRAL VIBRATION DAMPERS - 3/8" EHS OR OPGW	EA	10	$ 35.00	$ 350.00
134		SHIELDWIRE STOCKBRIDGE VIBRATION DAMPERS - 3/8" EHS OR OPGW	EA	10	$ 35.00	$ 350.00
		Total				$ 19,719,945.99
		Removal / Repair Units				
135		REMOVE AND REPLACE EXISTING INSULATOR ASSEMBLY	EA	12	$ 291.00	$ 3,492.00
136		REMOVE AND REPLACE CONDUCTOR OR STATIC ARMS	EA	12	$ 388.00	$ 4,656.00
137		REMOVE - SHIELDWIRE AND/OR CONDUCTOR HARDWARE ASSEMBLY	PER STR	7	$ 194.00	$ 1,358.00
138		REMOVE - SHIELDWIRE	PER 1K FT	11	$ 485.00	$ 5,238.00
139		REMOVE -CONDUCTOR	PER 1K FT	33	$ 776.00	$ 25,608.00
140		REMOVE - DIRECT EMBEDDED WOOD POLE	EA	50	$ 500.00	$ 25,000.00
141		REMOVE - DIRECT EMBEDDED STEEL POLE	EA	229	$ 1,455.00	$ 333,195.00
142		REMOVE - POLE ON CONCRETE FOUNDATION	EA	61	$ 1,940.00	$ 118,340.00
143		REMOVE - GUY MULTI-HELIX ANCHOR	EA	50	$ 97.00	$ 4,850.00
144		REMOVE - GUY CONCRETE ANCHOR	EA	12	$ 295.00	$ 3,540.00
145		REMOVE - CONCRETE PIER FOUNDATION	EA	9	$ 2,910.00	$ 26,190.00
		Total				$ 551,467.00
		Mobilization Units				
146		MOBILIZATION / DEMOBILIZATION - PROJECTS (< $50,000)	1-LOT	1	$ 10,000.00	$ 10,000.00
147		MOBILIZATION / DEMOBILIZATION - PROJECTS ($50,000 < $250,000)	1-LOT	6	$ 25,000.00	$ 150,000.00
148		MOBILIZATION / DEMOBILIZATION - PROJECTS ($250,000 < $1,000,000)	1-LOT	4	$ 40,000.00	$ 160,000.00
149		MOBILIZATION / DEMOBILIZATION - PROJECTS (> $1,000,000)	1-LOT	3	$ 55,000.00	$ 165,000.00
150		MOVE OFF PROJECT AND RETURN AT A LATER DATE FOR LABOR AND EQUIPMENT	1-LOT	4	$ 20,000.00	$ 80,000.00
		Total				$ 565,000.00
		Miscellaneous Units				
151		EQUIPMENT - CRANE, 50 TON, 110 FT BOOM	PER DAY	20	$ 776.00	$ 15,520.00
152		EQUIPMENT - CRANE, 100 TON, 160 FT BOOM	PER DAY	8	$ 1,288.00	$ 10,304.00
153		HEAVY CRANE WITH OPERATOR AND RIGGER - SUBCONTRACTED (10 HOUR DAY)	PER DAY	8	$ 3,616.00	$ 28,928.00
154		MOB IN/OUT FOR HEAVY CRANE ABOVE - SUBCONTRACTED	LS	8	$ 904.00	$ 7,232.00
155		CREW AND EQUIPMENT TIME AND EXPENSES - NORMAL WEEKDAY	PER DAY	40	$ 11,872.00	$ 474,880.00
156		CREW AND EQUIPMENT TIME AND EXPENSES - NIGHT	PER DAY	4	$ 14,247.00	$ 56,988.00
157		CREW AND EQUIPMENT TIME AND EXPENSES - HOLIDAY	PER DAY	4	$ 14,840.00	$ 59,360.00
158		HYDROVAC CREW	PER DAY	12	$ 3,800.00	$ 45,600.00
159		TRAFFIC CONTROL - with NO traffic plan required	PER DAY	12	$ 5,000.00	$ 60,000.00
160		TRAFFIC CONTROL - REQUIRES A TRAFFIC PLAN estimated $6,500/event. billed at Cost +10%	% Add	4	$ 25.00	$ 100.00
161		ROW CLEARING - SCATTERED LIGHT CLEARING	PER ACRE	12	$ 5,500.00	$ 66,000.00
162		ROW CLEARING - HEAVY CLEARING	PER ACRE	1	$ 25,000.00	$ 25,000.00
163		INSTALL & REMOVE FLEX BASE MATERIAL FOR EQUIPMENT ACCESS (LABOR, MATERIAL, & EQUIPMENT)	TN	200	$ 75.00	$ 15,000.00
164		TEMPORAY ACCESS ROAD (10' wide access road using gravel; price should include removal of access road.)	PER FT	4	$ 2,700.00	$ 10,800.00
165		INSTALL AND REMOVE CULVERT 1'-2' DIA. BY 20' LENGTH	EA	8	$ 2,000.00	$ 16,000.00
166		INSTALL AND REMOVE CULVERT 2'-4' DIA. BY 20' LENGTH	EA	12	$ 2,500.00	$ 30,000.00
167		INSTALL AND REMOVE CULVERT 4'-6' DIA. BY 20' LENGTH	EA	12	$ 3,000.00	$ 36,000.00
168		INSTALL AND REMOVE CULVERT >6' DIA. BY 20' LENGTH	EA	4	$ 3,500.00	$ 14,000.00
169		MAT RENTAL, PRICE PER MAT, PER DAY INCLUDING TRANSPORTATION, INSTALLATION AND REMOVAL	MAT	2,000	$ 15.00	$ 30,000.00
170		ROCK, COARSE AGGREGATE (3X5), DELIVERED, INSTALLED AND REMOVED	TN	200	$ 75.00	$ 15,000.00
171		SILT FENCE, INSTALLED, MAINTAINED IN OPERABLE CONDITION, AND REMOVED AT CONCLUSION OF PROJECT	LF	800	$ 12.00	$ 9,600.00
172		Chemical Spraying for ROW Clearing (75' ROW Width)	LF	48,000	$ 1.28	$ 61,440.00
		Total				$ 1,087,752.00

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Item No.	Spec. Section No.	Description	UOM	BID QTY		
		Additional Services - Equipment (PROVIDE COSTS)			**NORMAL**	**STORM/EMERGENCY**
173		1 TON FLATBED	HOUR	0	$ 47.00	$ 62.00
174		1100 DIGGER	HOUR	0	$ 82.00	$ 110.00
175		115 TON CRANE	HOUR	0	$ 143.00	$ 192.00
176		130 TON CRANE	HOUR	0	$ 161.00	$ 214.00
177		135 TON CRANE	HOUR	0	$ 171.00	$ 224.00
178		15 TON CRANE	HOUR	0	$ 77.00	$ 102.00
179		165 TON CRANE	HOUR	0	$ 168.00	$ 224.00
180		1-DRUM PULLER	HOUR	0	$ 60.00	$ 80.00
181		1Ton Crew Truck	HOUR	0	$ 51.00	$ 68.00
182		2 TON A-FRAME	HOUR	0	$ 47.00	$ 62.00
183		2 TON FLATBED	HOUR	0	$ 16.00	$ 22.00
184		20' FLATBED TRAILER	HOUR	0	$ 74.00	$ 98.00
185		20K PULLER	HOUR	0	$ 56.00	$ 74.00
186		25 TON CRANE	HOUR	0	$ 23.00	$ 32.00
187		270 DIGGER	HOUR	0	$ 83.00	$ 110.00
188		30' GOOSENECK TRAILER	HOUR	0	$ 161.00	$ 214.00
189		30 TON CRANE W/BASKET	HOUR	0	$ 56.00	$ 74.00
190		30K PULLER	HOUR	0	$ 158.00	$ 316.00
191		3100 DIGGER	HOUR	0	$ 161.00	$ 214.00
192		330 DIGGER	HOUR	0	$ 74.00	$ 148.00
193		3-DRUM PULLER	HOUR	0	$ 112.00	$ 150.00
194		4-6 WHEEL ATV	HOUR	0	$ 21.00	$ 28.00
195		4-DRUM PULLER	HOUR	0	$ 147.00	$ 214.00
196		50 TON CRANE	HOUR	0	$ 108.00	$ 144.00
197		50 TON CRANE W/BASKET	HOUR	0	$ 92.00	$ 138.00
198		50K PULLER	HOUR	0	$ 198.00	$ 296.00
199		54" SMOOTH DRUM ROLLER	HOUR	0	$ 44.00	$ 58.00
200		55 TON CRANE	HOUR	0	$ 113.00	$ 150.00
201		600 DIGGER	HOUR	0	$ 57.00	$ 76.00
202		65' BUCKET	HOUR	0	$ 45.00	$ 60.00
203		70 TON CRANE	HOUR	0	$ 117.00	$ 156.00
204		70 TON CRANE MANTIS (OR EQUIVALENT)	HOUR	0	$ 132.00	$ 176.00
205		700 DIGGER	HOUR	0	$ 97.00	$ 130.00
206		75’ BUCKET	HOUR	0	$ 52.00	$ 70.00
207		800 DIGGER	HOUR	0	$ 110.00	$ 150.00
208		85' BUCKET	HOUR	0	$ 59.00	$ 80.00
209		AIR COMPRESSOR	HOUR	0	$ 21.00	$ 28.00
210		ARCO CONC MIX 6 YD	HOUR	0	$ 32.00	$ 64.00
211		ARCO DOODLE BUG (OR EQUIVALENT)	HOUR	0	$ 28.00	$ 56.00
212		Backhoe	HOUR	0	$ 36.00	$ 45.00
213		Bucket Truck- 100'	HOUR	0	$ 145.00	$ 219.00
214		Bucket Truck- 125'	HOUR	0	$ 175.00	$ 250.00
215		Bucket Truck- 60'	HOUR	0	$ 52.00	$ 73.00
216		Bucket Truck- 80'	HOUR	0	$ 62.00	$ 88.00
217		BUCKET TRUCK, 100'	HOUR	0	$ 145.00	$ 219.00
218		BUCKET TRUCK, 125'	HOUR	0	$ 175.00	$ 262.00
219		BUCKET TRUCK, 150'	HOUR	0	$ 200.00	$ 300.00
220		BUCKET TRUCK, 170'	HOUR	0	$ 225.00	$ 338.00
221		CAT Challenger - Rubber Tracks	HOUR	0	$ 182.00	$ 274.00
222		CAT CHALLENGER CRAWLER TRACTOR (OR EQUIVALENT)	HOUR	0	$ 182.00	$ 274.00
223		CHIPPER	HOUR	0	$ 29.00	$ 58.00
224		CONCRETE MIXER 10 YD	HOUR	0	$ 58.00	$ 116.00
225		Crane 250ton AT With Operator & Rigger (Mob & Demob add $(amount))	HOUR	0	$ 550.00	$ 675.00
226		Crane 60ton RT	HOUR	0	$ 92.00	$ 138.00
227		Crane 70ton Crawler Mantis (OR EQUIVALENT)	HOUR	0	$ 116.00	$ 174.00
228		Crane Truck - Boom 35ton	HOUR	0	$ 68.00	$ 102.00
229		Crane Truck - Boom 50ton	HOUR	0	$ 84.00	$ 127.00
230		Crane Truck - 100ton	HOUR	0	$ 112.00	$ 168.00
231		CREW BOAT	HOUR	0	$ 34.00	$ 68.00
232		CREW CAB	HOUR	0	$ 50.00	$ 75.00
233		CREW TRUCK	HOUR	0	$ 55.00	$ 80.00
234		D-4 DOZER (OR EQUIVALENT)	HOUR	0	$ 53.00	$ 70.00
235		D-5 DOZER (OR EQUIVALENT)	HOUR	0	$ 56.00	$ 74.00
236		D-6 CAT (OR EQUIVALENT)	HOUR	0	$ 69.00	$ 92.00
237		D-7 DOZER (OR EQUIVALENT)	HOUR	0	$ 74.00	$ 98.00
238		D-8 DOZER SAG CAT (OR EQUIVALENT)	HOUR	0	$ 89.00	$ 134.00
239		Drill - OshKosh RS700L (OR EQUIVALENT)	HOUR	0	$ 156.00	$ 234.00
240		Drill - Watson - EDT 18 (OR EQUIVALENT)	HOUR	0	$ 218.00	$ 327.00
241		Drill - Watson 2500 (OR EQUIVALENT)	HOUR	0	$ 164.00	$ 246.00
242		Drill - Watson 3110 Crawler (OR EQUIVALENT)	HOUR	0	$ 231.00	$ 346.00
243		Drill - Watson EX 130 (OR EQUIVALENT)	HOUR	0	$ 218.00	$ 327.00
244		Dump Truck	HOUR	0	$ 47.00	$ 75.00
245		DUMP TRUCK 12 YD	HOUR	0	$ 50.00	$ 80.00
246		DUMP TRUCK 6 YD	HOUR	0	$ 30.00	$ 45.00
247		FIBER PULLER	HOUR	0	$ 45.00	$ 60.00
248		FIBER TENSIONER	HOUR	0	$ 45.00	$ 60.00
249		FIELD OFFICE	HOUR	0	$ 30.00	$ 40.00
250		FORKLIFT	HOUR	0	$ 38.00	$ 51.00
251		FOUNDATION DRILL 3110 (OR EQUIVALENT)	HOUR	0	$ 231.00	$ 346.00
252		FOUNDATION DRILL EX130 (OR EQUIVALENT)	HOUR	0	$ 197.00	$ 296.00
253		Fuel Truck	HOUR	0	$ 75.00	$ 113.00
254		Gl 6X6 truck	HOUR	0	$ 22.00	$ 33.00
255		GREASE TRUCK	HOUR	0	$ 35.00	$ 46.00
256		Guard Structure- Mobile	HOUR	0	$ 8.00	$ 12.00
257		HAUL TRUCK & TRAILER	HOUR	0	$ 55.00	$ 80.00
258		HD-19 DOZER (OR EQUIVALENT)	HOUR	0	$ 101.00	$ 134.00
259		HEAVY HAUL TRUCK AND TRAILER	HOUR	0	$ 88.00	$ 132.00
260		HOT SHOT TRUCK	HOUR	0	$ 64.00	$ 96.00
261		IT-28	HOUR	0	$ 87.00	$ 116.00
262		LARGE TRACK HOE	HOUR	0	$ 62.00	$ 93.00
263		LIGHT PLANT	HOUR	0	$ 15.00	$ 22.00
264		LINE TRUCK / DIGGER	HOUR	0	$ 48.00	$ 72.00
265		Line Truck w/Digger	HOUR	0	$ 48.00	$ 72.00
266		LOADER 1 CY	HOUR	0	$ 60.00	$ 80.00
267		LOADER 4CY	HOUR	0	$ 70.00	$ 100.00
268		LOG SKIDDER	HOUR	0	$ 45.00	$ 70.00
269		MANLIFT 45'	HOUR	0	$ 29.00	$ 38.00
270		MANLIFT 65'	HOUR	0	$ 32.00	$ 42.00
271		Mechanic Truck	HOUR	0	$ 45.00	$ 67.00
272		MINI EXCAVATOR	HOUR	0	$ 35.00	$ 47.00
273		MOTOR GRADER 12'	HOUR	0	$ 99.00	$ 132.00
274		MUD SLED	HOUR	0	$ 23.00	$ 30.00
275		Pick up 1500	HOUR	0	$ 15.00	$ 25.00
276		Pick up 2500	HOUR	0	$ 20.00	$ 30.00
277		PONTOON BOAT	HOUR	0	$ 39.00	$ 52.00

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Item No.	Spec. Section No.	Description	UOM	BID QTY		
		Additional Services - Equipment (PROVIDE COSTS)			**NORMAL**	**STORM/EMERGENCY**
278		Puller OPGW/OHGW	HOUR	0	$ 18.00	$ 27.00
279		Puller V Groove	HOUR	0	$ 72.00	$ 108.00
280		Puller 4 Drum	HOUR	0	$ 58.00	$ 87.00
281		Puller Single Drum 10k	HOUR	0	$ 26.00	$ 39.00
282		Puller Single Drum 30k	HOUR	0	$ 32.00	$ 48.00
283		Puller Single Drum SDk	HOUR	0	$ 50.00	$ 75.00
284		Road Sweeper	HOUR	0	$ 28.00	$ 52.00
285		ROPE RIG	HOUR	0	$ 54.00	$ 72.00
286		Skid Steer	HOUR	0	$ 48.00	$ 72.00
287		Splice Truck - 6X6	HOUR	0	$ 150.00	$ 200.00
288		STATIC TENSIONER	HOUR	0	$ 46.00	$ 62.00
289		Telescopic forklift	HOUR	0	$ 68.00	$ 102.00
290		TENSIONER	HOUR	0	$ 63.00	$ 84.00
291		Tensioner- Bundle Conductor	HOUR	0	$ 116.00	$ 174.00
292		Tensioner OPGW/OHGW	HOUR	0	$ 28.00	$ 42.00
293		Tensioner- Single Conductor	HOUR	0	$ 88.00	$ 132.00
294		TENSIONER/BUNDLED	HOUR	0	$ 116.00	$ 174.00
295		TOOL VAN	HOUR	0	$ 87.00	$ 114.00
296		TRACK CRANE	HOUR	0	$ 156.00	$ 234.00
297		Tractor	HOUR	0	$ 52.00	$ 78.00
298		Tractor- 6X6	HOUR	0	$ 38.00	$ 80.00
299		Trailer- Connex Box	HOUR	0	$ 12.00	$ 18.00
300		Trailer- Dump	HOUR	0	$ 6.00	$ 9.00
301		Trailer- Float	HOUR	0	$ 11.00	$ 17.00
302		Trailer- Gooseneck	HOUR	0	$ 9.00	$ 13.00
303		Trailer- Lowboy	HOUR	0	$ 17.00	$ 25.00
304		Trailer Mounted Air Compressor	HOUR	0	$ 18.00	$ 27.00
305		Trailer- Stinger Jeep	HOUR	0	$ 8.00	$ 12.00
306		Trailer- Stretch	HOUR	0	$ 18.00	$ 27.00
307		Trailer- Toolvan	HOUR	0	$ 6.00	$ 9.00
308		Trailer- Vacuum	HOUR	0	$ 137.00	$ 206.00
309		TRAILER-WIRE REEL STDS	HOUR	0	$ 41.00	$ 62.00
310		TRENCHER 3500 DW	HOUR	0	$ 37.00	$ 56.00
311		Truck 6X6 w/24' Flatbed	HOUR	0	$ 60.00	$ 90.00
312		VAC-TRON	HOUR	0	$ 48.00	$ 65.00
313		VAN TRAILER	HOUR	0	$ 29.00	$ 38.00
314		V-GROVE	HOUR	0	$ 87.00	$ 116.00
315		VIBER HAMMER	HOUR	0	$ 48.00	$ 72.00
316		WACKER PACKER	HOUR	0	$ 14.00	$ 21.00
317		Water Bowser	HOUR	0	$ 16.00	$ 24.00
318		WATER TRUCK 2000 GAL.	HOUR	0	$ 48.00	$ 64.00
319		WELDER	HOUR	0	$ 20.00	$ 26.00
320		Wheel Loader - 966 (OR EQUIVALENT)	HOUR	0	$ 141.00	$ 212.00
321		Wheel Loader - Komatsu 270 (OR EQUIVALENT)	HOUR	0	$ 85.00	$ 128.00
322		Winch Truck - OshKosh (OR EQUIVALENT)	HOUR	0	$ 60.00	$ 90.00
323		Wire Boat	HOUR	0	$ 300.00	$ 400.00
324		Apprentice 1	HOUR	0	$ 61.00	$ 92.00
325		Apprentice 2	HOUR	0	$ 64.00	$ 96.00
326		Apprentice 3	HOUR	0	$ 68.00	$ 102.00
327		Apprentice 4	HOUR	0	$ 71.00	$ 107.00
328		Apprentice 5	HOUR	0	$ 76.00	$ 114.00
329		Apprentice 6	HOUR	0	$ 80.00	$ 120.00
330		Apprentice 7	HOUR	0	$ 84.00	$ 126.00
331		BOND COSTS	DAY	0	$ 2,000.00	$ 4,000.00
332		CONCRETE FINISHER	HOUR	0	$ 98.00	$ 147.00
333		Equipment Operator	HOUR	0	$ 64.00	$ 96.00
334		FIELD CLERK	HOUR	0	$ 69.00	$ 104.00
335		Foreman	HOUR	0	$ 87.00	$ 131.00
336		General Foreman	HOUR	0	$ 104.00	$ 156.00
337		Groundman	HOUR	0	$ 57.00	$ 86.00
338		INSTRUMENT MAN	HOUR	0	$ 98.00	$ 147.00
339		IRONWORKER	HOUR	0	$ 96.00	$ 144.00
340		Journeyman lineman	HOUR	0	$ 86.00	$ 129.00
341		LABORER	HOUR	0	$ 57.00	$ 86.00
342		LINEMAN	HOUR	0	$ 86.00	$ 129.00
343		Mechanic	HOUR	0	$ 72.00	$ 108.00
344		OPERATOR	HOUR	0	$ 96.00	$ 144.00
345		PIER DIEM	HOUR	0	$ 17.00	$ 25.00
346		PROJECT MANAGER	HOUR	0	$ 136.00	$ 204.00
347		SAFETY MANAGER	HOUR	0	$ 144.00	$ 216.00
348		SUBSTATION TECH	HOUR	0	$ 106.00	$ 159.00
349		Superintendent	HOUR	0	$ 129.00	$ 169.00
350		TRUCK DRIVER	HOUR	0	$ 75.00	$ 113.00
351		WELDER	HOUR	0	$ 100.00	$ 150.00
					TOTAL BASE PROPOSAL:	**$ 32,572,927.99**

		Emergency Work				
289		Emergency Service Retainer	PER YEAR	5	$ 198,000.00	$ 990,000.00
290					$ -	$ -
291					$ -	$ -
					TOTAL EMG Proposal:	**$990,000.00**

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EXHIBIT G

INITIAL SCHEDULE OF VALUES

NONE

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EXHIBIT H

A detailed schedule and written plan will be created upon award per each work order.

Please see attached example.

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Examlple – Detail Work Plan

1. Owner to supply benchmarks/surveying for drilling of direct embeds.
2. IPC to haul direct embed poles from their laydown yard to ROW.
3. The staging crew will offload poles and place near the location of the structure. A 10k telehandler or wheeled loader to be used to place direct embeds in ROW. Tonnage to be placed under poles.
4. Drilling crew to commence drilling with tracked drill rig with clearance from ground to top of rig mast at 32'. IPC needs at least 6' clearance from line to be able to drill under the 161kV energized line. If this clearance distance is not met an outage would be required to complete drilling. Rig to have bullet teeth auger in case rock is encountered. Holes shall be drilled to depth and spoils spread out near site. Drill rig to have an operator and groundsman. Once holes are drilled and matting will be placed over the top for safety. The drilling crew would move to the next location.
5. Direct embed setting crew to come in behind drilling crew to set direct embeds. Aggregate backfill to be hauled to each structure location by a local company, prior to the setting of poles and drilling. Crew to rig top of direct embed to 10k telehandler or crane. 1st pole to be set in the center of the drilled hole. The second pole for H-frame to be positioned in the center of the hole. Jib to be attached to the top of both direct embeds to ensure the correct distance between the two before backfilling. Poles to be backfilled with aggregate and air tamped. Once aggregate filled to top jib will be removed and left-over aggregate will either be spread out or hauled to next location. The crew would move to the next structure location.
6. IPC to haul top sections of poles from the laydown yard to ROW. The staging crew will offload poles with a 10k telehandler or front-end loader. Poles to be placed near the final position of structure so framing can take place. Tonnage to be placed under poles.
7. Framing crew will come start framing poles on the ground. A torque gun will be used to make sure all bolts are torqued to correct specs. Poles to be framed near final location of structure so once complete they can be lifted straight up and placed.
8. Setting crew unclip and place blocks on the existing structure for the conductor and shield wire.
9. The setting crew will rig top of the framed pole that is on the ground. Pole will be picked up by a crane and set in place. Two bucket trucks will be in place to move the existing wire from the boom of the crane if required. Once the pole is in place the top section is bolted to the direct embeds. Bolts to be torqued with a gun to meet specification requirements.
10. Setting crew to hang blocks on new structure assembly location and run existing conductor and shield wire through, them except for the new OPGW.
11. Setting crew to transfer wire from blocks on existing poles. Existing poles to be topped if need be and removed.
12. Setting crew to grip the wire and transfer to new assemblies. Wire is not to be sagged between poles. Wire at the dead-end location will be sagged and clipped at new dead-ends only.

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13. Conductor jumper to be made at dead-end locations after the wire has been sagged.
14. Grounding/Anchor crew to come in drive ground rods into the ground and run grounding from pole to rod. If rock is encountered a minimum 6" hole to be drilled for ground rod. Ground rod and hole to be backfill with bentonite.
15. Grounding/Anchor crew to install anchors at the location that are called out. Digger derrick to install anchor into place. A dyno will be attached to anchor and digger derrick. Derrick will lift on the anchor to verify the installation is correct. Bucket truck will then be used to run guy from the top of the pole to anchor. Jack will be used to tension the guy to anchor. If rock is encountered then a hole shall be drilled. Anchor to be installed and backfilled with grout. Once grout is set up a pull test will be performed.
16. Direct embed crew will move matting and pull equipment to pull pockets for installing the new OPGW once their section is complete.
17. Framing and Setting crew will run rope through the blocks.
18. The crew will position the selves through the location of the OPGW that will be pulled.
19. Rope to be attached to the new OPGW and pulled through the blocks.
20. OPGW to be sagged.
21. Once sag is competed crew will start clipping in OPGW to new assemblies.
22. OPGW will be trained down the poles and splice kit will be installed at pole locations.
23. The process to repeated.

Purpose, Need, and Objectives

1. All IPC employees will always follow the IPC Onsite Safety plan as well as the owner's safety regulations and procedures. Please reference the IPC Safety Manual and Employee Handbook and Safety Guidelines for more information regarding general safety procedures and the company's drug-testing program.
2. IPC crews will always work to protect the environment and address any issues covered in the project's SWPP plan as soon as possible.
3. Before any job is started, regardless of the time of day, the field manager will explain the task and show every crew member the safety hazards associated with the work area and the task that is to be performed. This process, known as the Daily Pre- task Safety Huddle (IPC Safety Manual), will assure that every employee is aware of all safety hazards associated with a task prior to the beginning of the work.
4. The type of equipment and tooling used daily will be determined by the work that each crew is performing. The current work plan includes but is not limited to 100' bucket trucks, 40-ton truck crane, 10K telehandler, digger derrick, rope rig, OPGW tensioner, wire racks, skid-loader, mini-excavator, 950 loaders, etc.
5. Landowner coordination to be provided by Owner with support of IPC Project Manager.
6. IPC crews will either erect wooden guard or temporary (equipment provided) structures at each road and line crossings prior to beginning any wire pulling operation.

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7. This work plan is a guideline for the construction process of the project. There may be times during construction in which a situation calls for this plan to be altered.

Anticipated WorkForce and Equipment

Staging Area/Receiving ROW	1 Front-end Loader	Crew 2-3
	2 forklift	
	1 pickup truck	
Direct Embed Installation	1 Skid-Loader	Crew 6-7
	1 forklift/crane	
	1 60’ manlift	
	1 Tracked Drill Rig	
	2 pickup trucks	
Pole Framing	2 forklift	Crew 4-5
	1 pickup truck	
Pole Setting/Pole Demo	1 (40-ton) crane	Crew 6-7
	2 Buckets	
	1 Digger Derrick	
	2 pickup trucks	
Guys/Grounding Installation	1 Skid-Loader	Crew 3-4
	1 Mini-Excavator	
	1 Digger Derrick	
	1 Bucket Truck	
	1 pickup truck	

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OPGW Installation	1 Single Drum Rope	Crew 10-12
	4 Buckets	
	OPGW Tensioner	
	6x6 Truck	
	1 forklift	
	1 Dozer	
	1 (40-ton) crane	
	4 pickup trucks	
	Wire Rack	

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EXHIBIT I

ESCROW AGREEMENT

NONE

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EXHIBIT J

1 **SECTION 00 35 14**

2 CONFLICT OF INTEREST AFFIDAVIT - CSP

CONFLICT OF INTEREST QUESTIONNAIRE - FORM CIQ

For vendor or other person doing business with local governmental entity

This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code, by a vendor who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the vendor meets requirements under Section 176.006(a).

By law this questionnaire must be filed with the records administrator of the local government entity not later than the 7th business day after the date the vendor becomes aware of facts that require the statement to be filed. *See* Section 176.006(a-1), Local Government Code.

A vendor commits an offense if the vendor knowingly violates Section 176.006, Local Government Code. An offense under this section is a misdemeanor.

1 **Name of vendor who has a business relationship with local governmental entity.**

Integrated Power Co

2 ☐ **Check this box if you are filing an update to a previously filed questionnaire.**

(The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date on which you became aware that the originally filed questionnaire was incomplete or inaccurate.)

3 **Name of local government officer about whom the information in this section is being disclosed.**

_____

Name of Officer

This section, (item 3 including subparts A, B, C & D), must be completed for each officer with whom the vendor has an employment or other business relationship as defined by Section 176.001(1-a), Local Government Code. Attach additional pages to this Form CIQ as necessary.

A. Is the local government officer named in this section receiving or likely to receive taxable income, other than investment income, from the vendor?

☐ Yes ☐ No

B. Is the vendor receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer named in this section AND the taxable income is not received from the local governmental entity?

☐ Yes ☐ No

C. Is the filer of this questionnaire employed by a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership of one percent or more?

☐ Yes ☐ No

D. Describe each employment or business and family relationship with the local government officer named in this section.

4 ☑ **I have no Conflict of Interest to disclose.**

5 Kathryn Hisl _____ 06/04/2025

Signature of vendor doing business with the governmental entity Date

3 **END OF SECTION**

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SECTION 00 41 01
PROPOSAL FORM - CSP

TO: City of Denton
c/o: Purchasing Division
901-B Texas Street
Denton, Texas 76209

FOR: **Transmission Line Construction and Maintenance**

1 Enter into Agreement

The undersigned Offeror proposes and agrees, if this Proposal is accepted, to enter into an Agreement with City in the form included in the Proposal Documents to perform and furnish all Work as specified or indicated in the Contract Documents for the Unit Price Proposal and within the Contract Time indicated in this Proposal and in accordance with the other terms and conditions of the Contract Documents.

2 OFFEROR Acknowledgements and Certification

2.1 This is an IDIQ contract that will be used on an as-needed basis. Each work order will have a unique site and the Proposer should take this into consideration in formulating its Proposal.

2.2 In submitting this Proposal, Offeror accepts all of the terms and conditions of the INVITATION TO OFFORERS and INSTRUCTIONS TO OFFORERS, including without limitation those dealing with the disposition of Offeror's Bond.

2.3 Offeror is aware of all costs to provide the required insurance, will do so pending contract award, and will provide a valid insurance certificate meeting all requirements within 14 days of notification of award.

2.4 Offeror certifies that this Proposal is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation.

2.5 Offeror has not directly or indirectly induced or solicited any other Offeror to submit a false or sham Proposal.

2.6 Offeror has not solicited or induced any individual or entity to refrain from proposing.

2.7 Offeror has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Agreement. For the purposes of this Paragraph:

a. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the proposal process.

b. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the proposal process to the detriment of City (b) to establish proposal prices at artificial non-competitive levels, or (c) to deprive City of the benefits of free and open competition.

c. "collusive practice" means a scheme or arrangement between two or more Offerors, with or without the knowledge of City, a purpose of which is to establish proposal prices at artificial, non-competitive levels.

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d. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the proposal process or affect the execution of the Contract.

2.8 The Offeror acknowledges and agrees to comply with the requirements of City Ethics Ordinance No. 23-1165.

3 Time of Completion

PART 1 - THE WORK WILL BE COMPLETE FOR FINAL ACCEPTANCE WITHIN THE DAYS SPECIFIED IN EACH PROJECT. Offeror accepts the provisions of the Agreement as to Liquidated Damages in the event of failure to obtain Milestones (if applicable), Substantial Completion, and Final Acceptance within the times specified in the Agreement.

4 Attached to this Proposal

4.1 The following documents are attached to and made a part of this Proposal:

a. Section 00 35 14 – Conflict of Interest Affidavit – CSP
b. Section 00 41 01 – This Proposal Form – CSP
c. **Section 00 42 44 – Unit Price Proposal Form – CSP – Excel Electronic Copy (either included in the hard copy Proposal, or submitted via Ionwave)**
d. Section 00 43 38 – Proposed Subcontractors Form – CSP
e. Section 00 43 39 – Vendor Compliance to State Law Non-Resident Offeror – CSP
f. Section 00 45 14 – Safety Record Questionnaire – CSP
g. Section 00 45 27 – Contractor Compliance with Workers Compensation Law – CSP
h. Section 00 45 44 – Corporate Resolution of Authorized Signatories – CSP
i. Any additional documents required by Paragraph 12 of Section 00 21 16 – Instructions to Offerors

5 Total Proposal Amount

5.1 Offeror will complete the Work in accordance with the Contract Documents for the line items rate specified in the unit price proposal form. In the space provided below, please enter the total proposed amount for all line items in the unit price proposal form. This figure will be read publicly by the City at the proposal opening.

5.2 It is understood and agreed by the Offeror in signing this proposal that the total proposed amount entered below is subject to verification and/or modification by multiplying the unit prices for each pay item by the respective estimated quantities shown in this proposal and then totaling all of the extended amounts.

Total Proposal Amount: $ 33,562,927.99

6 Proposal Submittal

6.1 It is understood by Offeror that submission of the total proposal amount is only one of the factors for the City's evaluation process, and that any award of contract will be based on the complete evaluation of the Proposal and Offeror by City under the terms provided in the Instructions to Offerors or any validly issued amendments or addenda.

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6.2 This Proposal is submitted on June 4, 2025 by the entity named below.

7 Addendum Acknowledgement

7.1 PROPOSER has examined and carefully studied the Proposal Documents and Addenda, including the question and answers provided on the City's eBid website for the project. PROPOSER hereby acknowledges receipt of the following addenda: (list addenda by addendum number and date).

Addendum No.:_____ Dated:_____
Addendum No.:_____ Dated:_____
Addendum No.:_____ Dated:_____

Respectfully submitted,

By: Kathryn Hisel
(Signature)

Kathryn Hisel
(Printed Name)

Title: COO

Company: Integrated Power Co

Address: 2100 E 4th St, North Platte, NE 69101

State of Incorporation: Colorado

Email: khisel@ip-co.net

Phone: 308-221-6267

INTEGRATED POWER CO. CORPORATE SEAL COLORADO

END OF SECTION

"General Decision Number: TX20250243 03/14/2025

Superseded General Decision Number: TX20240243

State: Texas

Construction Type: Building

County: Denton County in Texas.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(1).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	. Executive Order 14026 generally applies to the contract. . The contractor must pay all covered workers at least $17.75 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2025.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	. Executive Order 13658 generally applies to the contract. . The contractor must pay all covered workers at least $13.30 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2025.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at http://www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/03/2025
1	03/14/2025

ASBE0021-011 06/01/2023

	Rates	Fringes
ASBESTOS WORKER/HEAT & FROST INSULATOR (Duct, Pipe and Mechanical System Insulation)	$ 31.32	7.52

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* BOIL0074-003 01/01/2025

	Rates	Fringes
BOILERMAKER	$ 33.17	24.92

CARP1421-002 10/01/2023

	Rates	Fringes
MILLWRIGHT	$ 32.02	11.27

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* ELEV0021-006 01/01/2025

	Rates	Fringes
ELEVATOR MECHANIC	$ 51.93	38.435+a+b

FOOTNOTES:

A. 6% under 5 years based on regular hourly rate for all hours worked. 8% over 5 years based on regular hourly rate for all hours worked.

B. New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, Christmas Day, and Veterans Day.

ENGI0178-005 06/01/2020

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
(1) Tower Crane	$ 32.85	13.10
(2) Cranes with Pile Driving or Caisson Attachment and Hydraulic Crane 60 tons and above	$ 28.75	10.60
(3) Hydraulic cranes 59 Tons and under	$ 32.35	13.10

IRON0263-005 06/01/2024

	Rates	Fringes
IRONWORKER (ORNAMENTAL AND STRUCTURAL)	$ 28.64	7.93

PLUM0100-008 11/01/2024

	Rates	Fringes
HVAC MECHANIC (HVAC Unit Installation Only)	$ 39.76	14.04

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* SUTX2014-019 07/21/2014

	Rates	Fringes
BRICKLAYER	$ 19.89	0.00
CARPENTER, Excludes Drywall Hanging, Form Work, and Metal Stud Installation	$ 19.25	0.00
CAULKER	$ 16.63 **	0.00
CEMENT MASON/CONCRETE FINISHER	$ 12.93 **	0.00
DRYWALL HANGER AND METAL STUD INSTALLER	$ 15.42 **	0.00
ELECTRICIAN (Alarm Installation Only)	$ 18.83	3.32
ELECTRICIAN (Communication Technician Only)	$ 19.98	3.64
ELECTRICIAN (Low Voltage Wiring Only)	$ 15.80 **	2.18
ELECTRICIAN, Excludes Low Voltage Wiring and Installation of Alarms/Sound and Communication Systems	$ 18.82	0.83
FORM WORKER	$ 12.13 **	0.00
GLAZIER	$ 16.55 **	3.13
HIGHWAY/PARKING LOT STRIPING: Operator (Striping Machine)	$ 10.04 **	2.31
INSTALLER - SIDING (METAL/ALUMINUM/VINYL)	$ 14.74 **	0.00
INSTALLER - SIGN	$ 15.61 **	0.00
INSULATOR - BATT	$ 13.00 **	0.00
IRONWORKER, REINFORCING	$ 14.02 **	0.00
LABORER: Common or General	$ 11.76 **	0.00
LABORER: Mason Tender - Brick	$ 10.54 **	0.00
LABORER: Mason Tender - Cement/Concrete	$ 10.75 **	0.00
LABORER: Pipelayer	$ 13.00 **	0.35
LABORER: Plaster Tender	$ 12.22 **	0.00
LABORER: Roof Tearoff	$ 11.28 **	0.00
LABORER: Landscape and Irrigation	$ 12.50 **	0.48
LATHER	$ 16.00 **	0.00
OPERATOR:		

Backhoe/Excavator/Trackhoe	$ 12.83 **	0.00
OPERATOR: Bobcat/Skid Steer/Skid Loader	$ 13.93 **	0.00
OPERATOR: Bulldozer	$ 18.29	1.31
OPERATOR: Drill	$ 15.69 **	0.50
OPERATOR: Forklift	$ 13.21 **	0.81
OPERATOR: Grader/Blade	$ 12.48 **	0.00
OPERATOR: Loader	$ 13.46 **	0.85
OPERATOR: Mechanic	$ 17.52 **	3.33
OPERATOR: Paver (Asphalt, Aggregate, and Concrete)	$ 18.44	0.00
OPERATOR: Roller	$ 15.04 **	0.00
PAINTER (Brush, Roller and Spray), Excludes Drywall Finishing/Taping	$ 13.21 **	2.33
PAINTER: Drywall Finishing/Taping Only	$ 13.76 **	2.84
PIPEFITTER, Excludes HVAC Pipe Installation	$ 22.98	6.35
PLASTERER	$ 15.75 **	0.00
PLUMBER (HVAC Pipe Installation Only)	$ 22.16	5.46
PLUMBER, Excludes HVAC Pipe Installation	$ 20.84	4.74
ROOFER	$ 17.19 **	0.00
SHEET METAL WORKER (HVAC Duct Installation Only)	$ 20.88	5.19
SHEET METAL WORKER, Excludes HVAC Duct Installation	$ 24.88	5.97
SPRINKLER FITTER (Fire Sprinklers)	$ 22.94	0.00
TILE FINISHER	$ 11.22 **	0.00
TILE SETTER	$ 14.25 **	0.00
TRUCK DRIVER: 1/Single Axle Truck	$ 16.40 **	0.81
TRUCK DRIVER: Dump Truck	$ 12.39 **	1.18
TRUCK DRIVER: Flatbed Truck	$ 19.65	8.57
TRUCK DRIVER: Semi-Trailer Truck	$ 12.50 **	0.00

TRUCK DRIVER: Water Truck.....$ 12.00 ** 4.11

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 ($17.75) or 13658 ($13.30). Please see the Note at the top of the wage determination for more information. Please also note that the minimum wage requirements of Executive Order 14026 are not currently being enforced as to any contract or subcontract to which the states of Texas, Louisiana, or Mississippi, including their agencies, are a party.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at https://www.dol.gov/agencies/whd/government-contracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

The body of each wage determination lists the classifications and wage rates that have been found to be prevailing for the type(s) of construction and geographic area covered by the wage determination. The classifications are listed in alphabetical order under rate identifiers indicating whether the particular rate is a union rate (current union negotiated rate), a survey rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

Union Rate Identifiers

A four-letter identifier beginning with characters other than ""SU"", ""UAVG"", ?SA?, or ?SC? denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2024 in the

example, is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE: UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

Survey Rate Identifiers

The ""SU"" identifier indicates that either a single non-union rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that classification. FL indicates the State of Florida. 2022 is the year of the survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

?SU? wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

State Adopted Rate Identifiers

The ""SA"" identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 01/03/2024 in the example, reflects the date on which the classifications and rates under the ?SA? identifier took effect under state law in the state from which the rates were adopted.

WAGE DETERMINATION APPEALS PROCESS

1) Has there been an initial decision in the matter? This can be:

a) a survey underlying a wage determination
b) an existing published wage determination
c) an initial WHD letter setting forth a position on a wage determination matter
d) an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to davisbaconinfo@dol.gov or by mail to:

Branch of Wage Surveys
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

Regarding any other wage determination matter such as conformance decisions, requests for initial decisions should be directed to the WHD Branch of Construction Wage Determinations. Requests can be submitted via email to BCWD-Office@dol.gov or by mail to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2) If an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via email to dba.reconsideration@dol.gov or by mail to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210.

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END OF GENERAL DECISION"

Certificate Of Completion

Envelope Id: 45D94101-DFDA-4D99-8A65-B405DB143A78
Status: Sent
Subject: Please DocuSign: City Council Contract 8776 Transmission Line Maintenance and Construction
Source Envelope:
Document Pages: 147
Signatures: 3
Certificate Pages: 6
Initials: 1
AutoNav: Enabled
EnvelopeId Stamping: Enabled
Time Zone: (UTC-06:00) Central Time (US & Canada)

Envelope Originator:
Crystal Westbrook
901B Texas Street
Denton, TX 76209
crystal.westbrook@cityofdenton.com
IP Address: 198.49.140.10

Record Tracking

Status: Original
10/20/2025 8:42:26 AM
Holder: Crystal Westbrook
crystal.westbrook@cityofdenton.com
Location: DocuSign

Signer Events	Signature	Timestamp
Crystal Westbrook crystal.westbrook@cityofdenton.com Senior Buyer City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign	**Completed** Using IP Address: 198.49.140.10	Sent: 10/20/2025 8:56:26 AM Viewed: 10/20/2025 8:56:41 AM Signed: 10/20/2025 9:01:01 AM
Lori Hewell lori.hewell@cityofdenton.com Purchasing Manager City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign	 Signature Adoption: Pre-selected Style Using IP Address: 198.49.140.10	Sent: 10/20/2025 9:01:04 AM Viewed: 10/20/2025 1:52:44 PM Signed: 10/20/2025 1:55:30 PM
Marcella Lunn marcella.lunn@cityofdenton.com Senior Deputy City Attorney City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign	 Signature Adoption: Pre-selected Style Using IP Address: 198.49.140.10	Sent: 10/20/2025 1:55:33 PM Viewed: 10/21/2025 6:50:17 PM Signed: 10/21/2025 6:54:07 PM
Kathryn Hisel khisel@ip-co.net Owner Kathryn Hisel Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Accepted: 10/23/2025 9:22:59 AM ID: b3e42200-64c9-4f1c-ad4b-3a7f601adeb3	 Signature Adoption: Pre-selected Style Using IP Address: 135.84.222.67	Sent: 10/21/2025 6:54:10 PM Resent: 11/3/2025 10:58:22 AM Resent: 11/6/2025 3:47:33 PM Viewed: 11/6/2025 4:09:10 PM Signed: 11/6/2025 4:22:13 PM

Signer Events	Signature	Timestamp
Antonio Puente, Jr. antonio.puente@cityofdenton.com DME General Manager Denton Municipal Electric Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Accepted: 11/6/2025 4:27:01 PM ID: c506d544-0670-454c-8c5c-784e05a7c883	Signed by: E3760944C2BF4B5... Signature Adoption: Pre-selected Style Using IP Address: 198.49.140.10	Sent: 11/6/2025 4:22:16 PM Viewed: 11/6/2025 4:27:01 PM Signed: 11/6/2025 4:27:30 PM
Cheyenne Defee cheyenne.defee@cityofdenton.com Procurement Administration Supervisor City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign		Sent: 11/6/2025 4:27:34 PM
Sara Hensley sara.hensley@cityofdenton.com Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign		
Ingrid Rex ingrid.rex@cityofdenton.com Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign		

In Person Signer Events	Signature	Timestamp

Editor Delivery Events	Status	Timestamp

Agent Delivery Events	Status	Timestamp

Intermediary Delivery Events	Status	Timestamp

Certified Delivery Events	Status	Timestamp

Carbon Copy Events	Status	Timestamp
Cheyenne Defee cheyenne.defee@cityofdenton.com Procurement Administration Supervisor City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign	COPIED	Sent: 10/20/2025 9:01:04 AM
Gretna Jones gretna.jones@cityofdenton.com Legal Secretary City of Denton Security Level: Email, Account Authentication (None)	COPIED	Sent: 11/6/2025 4:27:33 PM Viewed: 11/10/2025 9:40:17 AM

Carbon Copy Events	Status	Timestamp
Electronic Record and Signature Disclosure: Not Offered via Docusign		
City Secretary Office citysecretary@cityofdenton.com Security Level: Email, Account Authentication (None)		
Electronic Record and Signature Disclosure: Not Offered via Docusign		
Mark Zimmerer mark.zimmerer@cityofdenton.com Security Level: Email, Account Authentication (None)		
Electronic Record and Signature Disclosure: Accepted: 10/29/2025 4:42:06 PM ID: 98f125b3-431c-46e1-8e81-15c2fed32a68		

Witness Events	Signature	Timestamp

Notary Events	Signature	Timestamp

Envelope Summary Events	Status	Timestamps
Envelope Sent	Hashed/Encrypted	10/20/2025 8:56:26 AM
Envelope Updated	Security Checked	10/20/2025 8:59:31 AM

Payment Events	Status	Timestamps

Electronic Record and Signature Disclosure

ELECTRONIC RECORD AND SIGNATURE DISCLOSURE

From time to time, City of Denton (we, us or Company) may be required by law to provide to you certain written notices or disclosures. Described below are the terms and conditions for providing to you such notices and disclosures electronically through your DocuSign, Inc. (DocuSign) Express user account. Please read the information below carefully and thoroughly, and if you can access this information electronically to your satisfaction and agree to these terms and conditions, please confirm your agreement by clicking the 'I agree' button at the bottom of this document.

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At any time, you may request from us a paper copy of any record provided or made available electronically to you by us. For such copies, as long as you are an authorized user of the DocuSign system you will have the ability to download and print any documents we send to you through your DocuSign user account for a limited period of time (usually 30 days) after such documents are first sent to you. After such time, if you wish for us to send you paper copies of any such documents from our office to you, you will be charged a $0.00 per-page fee. You may request delivery of such paper copies from us by following the procedure described below.

Withdrawing your consent

If you decide to receive notices and disclosures from us electronically, you may at any time change your mind and tell us that thereafter you want to receive required notices and disclosures only in paper format. How you must inform us of your decision to receive future notices and disclosure in paper format and withdraw your consent to receive notices and disclosures electronically is described below.

Consequences of changing your mind

If you elect to receive required notices and disclosures only in paper format, it will slow the speed at which we can complete certain steps in transactions with you and delivering services to you because we will need first to send the required notices or disclosures to you in paper format, and then wait until we receive back from you your acknowledgment of your receipt of such paper notices or disclosures. To indicate to us that you are changing your mind, you must withdraw your consent using the DocuSign 'Withdraw Consent' form on the signing page of your DocuSign account. This will indicate to us that you have withdrawn your consent to receive required notices and disclosures electronically from us and you will no longer be able to use your DocuSign Express user account to receive required notices and consents electronically from us or to sign electronically documents from us.

All notices and disclosures will be sent to you electronically

Unless you tell us otherwise in accordance with the procedures described herein, we will provide electronically to you through your DocuSign user account all required notices, disclosures, authorizations, acknowledgements, and other documents that are required to be provided or made available to you during the course of our relationship with you. To reduce the chance of you inadvertently not receiving any notice or disclosure, we prefer to provide all of the required notices and disclosures to you by the same method and to the same address that you have given us. Thus, you can receive all the disclosures and notices electronically or in paper format through the paper mail delivery system. If you do not agree with this process, please let us know as described below. Please also see the paragraph immediately above that describes the consequences of your electing not to receive delivery of the notices and disclosures electronically from us.

How to contact City of Denton:
You may contact us to let us know of your changes as to how we may contact you electronically, to request paper copies of certain information from us, and to withdraw your prior consent to receive notices and disclosures electronically as follows:
To contact us by email send messages to: purchasing@cityofdenton.com

To advise City of Denton of your new e-mail address
To let us know of a change in your e-mail address where we should send notices and disclosures electronically to you, you must send an email message to us at melissa.kraft@cityofdenton.com and in the body of such request you must state: your previous e-mail address, your new e-mail address. We do not require any other information from you to change your email address..
In addition, you must notify DocuSign, Inc to arrange for your new email address to be reflected in your DocuSign account by following the process for changing e-mail in DocuSign.

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To withdraw your consent with City of Denton
To inform us that you no longer want to receive future notices and disclosures in electronic format you may:

i. decline to sign a document from within your DocuSign account, and on the subsequent page, select the check-box indicating you wish to withdraw your consent, or you may;
ii. send us an e-mail to purchasing@cityofdenton.com and in the body of such request you must state your e-mail, full name, IS Postal Address, telephone number, and account number. We do not need any other information from you to withdraw consent.. The consequences of your withdrawing consent for online documents will be that transactions may take a longer time to process..

Required hardware and software

Operating Systems:	Windows2000? or WindowsXP?
Browsers (for SENDERS):	Internet Explorer 6.0? or above
Browsers (for SIGNERS):	Internet Explorer 6.0?, Mozilla FireFox 1.0, NetScape 7.2 (or above)
Email:	Access to a valid email account
Screen Resolution:	800 x 600 minimum
Enabled Security Settings:	•Allow per session cookies •Users accessing the internet behind a Proxy Server must enable HTTP 1.1 settings via proxy connection

** These minimum requirements are subject to change. If these requirements change, we will provide you with an email message at the email address we have on file for you at that time providing you with the revised hardware and software requirements, at which time you will have the right to withdraw your consent.

Acknowledging your access and consent to receive materials electronically
To confirm to us that you can access this information electronically, which will be similar to other electronic notices and disclosures that we will provide to you, please verify that you were able to read this electronic disclosure and that you also were able to print on paper or electronically save this page for your future reference and access or that you were able to e-mail this disclosure and consent to an address where you will be able to print on paper or save it for your future reference and access. Further, if you consent to receiving notices and disclosures exclusively in electronic format on the terms and conditions described above, please let us know by clicking the 'I agree' button below.
By checking the 'I Agree' box, I confirm that:

- I can access and read this Electronic CONSENT TO ELECTRONIC RECEIPT OF ELECTRONIC RECORD AND SIGNATURE DISCLOSURES document; and

- I can print on paper the disclosure or save or send the disclosure to a place where I can print it, for future reference and access; and

- Until or unless I notify City of Denton as described above, I consent to receive from exclusively through electronic means all notices, disclosures, authorizations, acknowledgements, and other documents that are required to be provided or made available to me by City of Denton during the course of my relationship with you.

City of Denton

City Hall
215 E. McKinney Street
Denton, Texas
www.cityofdenton.com

AGENDA INFORMATION SHEET

DEPARTMENT: Procurement

ACM: Christine Taylor

DATE: December 15, 2025

SUBJECT

Consider recommending adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute a contract with Stuart C. Irby Company, LLC, for the purchase of high voltage circuit breakers for Denton Municipal Electric; providing for the expenditure of funds therefor; and providing an effective date (RFP 8836 – awarded to Stuart C. Irby Company, LLC, for one (1) year, with the option for four (4) additional one (1) year extensions, in the total five (5) year not-to-exceed amount of $22,257,824.00).

STRATEGIC ALIGNMENT

This action supports Key Focus Area: Enhance Infrastructure and Mobility.

INFORMATION/BACKGROUND

Denton Municipal Electric (DME) has projects in its five (5) year Capital Improvement Plan (CIP) that require the purchase of 138kV and 345kV circuit breakers. Circuit breakers are necessary substation protective devices that have the capability to interrupt the flow of electrical current during faults to prevent damage to equipment, structures, and personnel. DME currently has 132 high voltage circuit breakers in service and anticipates purchasing up to 50 during the next five (5) years for CIP projects.

The following contract estimate is based on the quantities of circuit breakers needed for approved and future CIP projects. A 10% contingency was added for cost increases and system planning updates over the term of the contract. The proposed contract does not require expenditure of any minimum amount. Purchase orders will be issued based on need in project construction schedules.

	Qty	Description	Unit Price	Extended Price
Year 1	6	3000A, 138kV Circuit Breaker, 63kA - 2000A CTs	$232,355	$1,394,130
			Year 1 Total	**$1,394,130**
Year 2	3	3000A, 138kV Circuit Breaker, 63kA - 2000A CTs	232,355	697,065
	19	4000A, 345kV Circuit Breaker, 63kA -3000A CTs	661,740	12,573,060
	12	4000A, 138kV Circuit Breaker, 63kA- 3000A CTs	261,000	3,132,000
			Year 2 Total	**$16,402,125**

Year 3	6	3000A, 138kV Circuit Breaker, 63kA - 2000A CTs	232,355	1,394,130
			Year 3 Total	**$1,394,130**
Year 4	2	4000A, 138kV Circuit Breaker, 63kA- 3000A CTs	261,000	522,000
			Year 4 Total	**$522,000**
Year 5	2	4000A, 138kV Circuit Breaker, 63kA- 3000A CTs	261,000	522,000
			Year 5 Total	**$522,000**
			Total	**$20,234,385**
			10% Contingency	$2,023,439
			Contract Estimate Total	**$22,257,824**

Request for Proposals was sent to 453 prospective suppliers, including 12 Denton firms. In addition, specifications were placed on the Procurement website for prospective suppliers to download and advertised in the local newspaper. Two (2) proposals were received, references were checked, and proposals were evaluated based upon published criteria, including price, delivery, compliance with specifications, and probable performance. Best and Final Offers (BAFO) were requested from the top firms. Based upon this evaluation, Stuart C. Irby Company, LLC was ranked the highest and determined to be the best value for the City.

NIGP Code Used for Solicitation:	**285** - Electrical Equipment and Supplies (Except Cable and Wire)
Notifications sent for Solicitation sent in IonWave:	453
Number of Suppliers that viewed Solicitation in IonWave:	34
HUB-Historically Underutilized Business Invitations sent out:	50
SBE-Small Business Enterprise Invitations sent out:	178
Responses from Solicitation:	2

RECOMMENDATION

Award a contract with Stuart C. Irby Company, LLC, for the purchase of high voltage circuit breakers for Denton Municipal Electric, in a one (1) year, with the option for four (4) additional one (1) year extensions, in the total five (5) year not-to-exceed amount of $22,257,824.

PRINCIPAL PLACE OF BUSINESS

Stuart C. Irby Company, LLC
Fort Worth, TX

ESTIMATED SCHEDULE OF PROJECT

This is an initial one (1) year contract with options to extend the contract for four (4) additional one (1) year periods, with all terms and conditions remaining the same. Orders will be placed as project schedules require and will be delivered within 145-185 weeks.

FISCAL INFORMATION

The costs for materials purchased under the proposed agreement will be funded out of amounts budgeted for specific projects. The work proposed will be in the transmission category. These costs for transmission projects will ultimately be recovered through the Public Utility Commission Transmission Cost of Service Program (TCOS). The budgeted amount for this item is $22,257,824.

EXHIBITS

Exhibit 1: Agenda Information Sheet
Exhibit 2: Pricing Evaluation
Exhibit 3: Presentation
Exhibit 4: Ordinance and Contract

Respectfully submitted:
Lori Hewell, 940-349-7100
Purchasing Manager

For information concerning this acquisition, contact: Mark Zimmerer, 940-349-7169.

Legal point of contact: Marcella Lunn at 940-349-8333.

Exhibit 2

RFP 8836 - Pricing Evaluation for Electric Utility High Voltage Circuit Breakers

					Respondent's Business Name:	**Stuart C. Irby Company, LLC**	Techline, Inc.
					Principal Place of Business (City and State):	**Fort Worth, TX**	Fort Worth, TX
Line #	**Description**	**Mfgr**	**QTY**	**UOM**		**Unit**	**Unit**
SECTION I - CIRCUIT BREAKERS - SIEMENS							
2	3000A, 138kV Circuit Breaker, 40kA	SIEMENS	2	EA		**$154,783.00**	$158,040.00
3	3000A, 138kV Circuit Breaker, 63kA	SIEMENS	10	EA		**$233,355.00**	$237,250.00
4	4000A, 138kV Circuit Breaker, 63kA (12 BCTs -2000:5)	SIEMENS	12	EA		**$255,625.00**	$261,005.00
5	4000A, 345kV Circuit Breaker, 63kA (12 BCTs -3000:5)	SIEMENS	8	EA		**$661,740.00**	$675,515.00
6	4000A, 138kV Circuit Breaker, 63kA (12 BCTs -3000:5)	SIEMENS	1	EA		**$261,000.00**	$261,005.00
SECTION II - CIRCUIT BREAKERS - MITSUBISHI							
7	3000A, 138kV Circuit Breaker, 40kA	MITSUBISHI	2	EA		**No Bid**	No Bid
8	3000A, 138kV Circuit Breaker, 50kA	MITSUBISHI	10	EA		**No Bid**	No Bid
9	4000A, 138kV Circuit Breaker, 50kA	MITSUBISHI	12	EA		**No Bid**	No Bid
10	4000A, 345kV Circuit Breaker, 50kA	MITSUBISHI	8	EA		**No Bid**	No Bid
SECTION III - 61850 OPTION							
12	Add (2) SEL-421 Merging Units with Wiring as shown in Spec.		12	Per Breaker		**No Bid**	No Bid
SECTION IV - MAINTENANCE PARTS							
14	Y-Relay		1	EA		**$720.00**	$685.00
15	Close Coil		1	EA		**$610.00**	$580.00
16	Trip Coil		1	EA		**$610.00**	$580.00
17	Charging Motor		1	EA		**$1,330.00**	$1,265.00
18	Cabinet Heater		3	EA		**No Bid**	No Bid
SECTION V - RECOMMENDED SPARE PARTS							
20	Porcelain Bushings (145kV)		1	EA		**$2,160.00**	$2,050.00

Evaluation			
Item #	**Scoring Criteria**	**Stuart C. Irby Company, LLC**	Techline, Inc.
1	Delivery/Project Schedule - 20%	**12.00**	12.00
2	Compliance with Specifications - 20%	**12.00**	12.00
3	Probable Performance - 20%	**14.67**	14.67
4	Price, Total Cost of Ownership - 40%	**40.00**	39.01
	Total Score:	**78.67**	77.68

8836 – High Voltage Circuit Breakers

File ID PUB25-231

Mark Zimmerer, P.E.

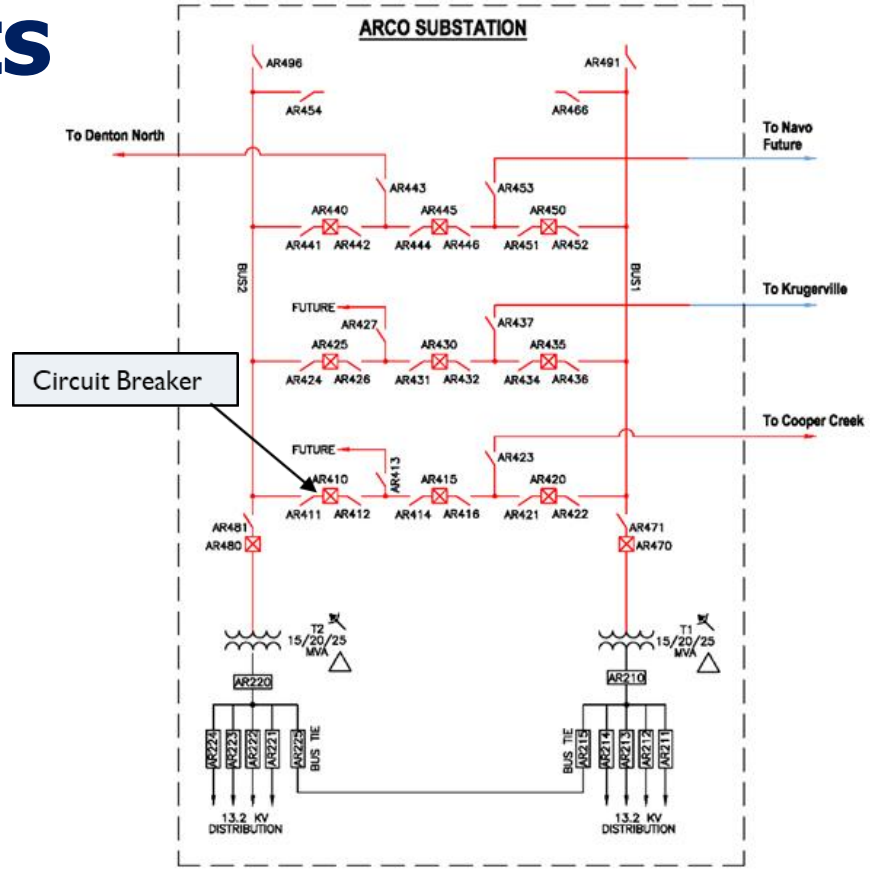
Electric Engineering Supervisor

Denton Municipal Electric

12-15-2025

Essential Functions & Benefits

- **Primary Function**: Circuit breakers interrupt the flow of current when a fault is detected, preventing damage to equipment, structures, and personnel.
- **Reset Capability**: Unlike fuses, which need replacement after a single use, circuit breakers can be reset manually or automatically to resume normal operation once the fault is cleared.
- **Strategic Placement**: Located within electric substations, circuit breakers are arranged to isolate circuits as needed. This helps limit damage from overloads or short circuits and facilitates routine maintenance.



Purchase Planning

- **Rising Demand**: Load demand is increasing across Texas and the U.S., leading to higher material requests.
- **Extended Lead Times**: As a result, lead times continue to lengthen.
- **Advance Planning**: Purchases must be made years in advance to meet schedules and ensure timely project completion.

Circuit Breaker	Lead Time
138kV, 40kA	105-115 weeks
138kV, 63kA	140-145 weeks
345kV, 63kA	170-185 weeks

Request for Proposals

- RFP 8836 was advertised to purchase 138kV and 345kV circuit breakers
- The RFP requested unit costs for different voltage and amperage transformers.
- Two proposals were received.
- Evaluation was based on compliance with specification, probable performance, delivery, and price.

Contract Estimate

Qty	Description	Unit Price	Extended Price
15	3000A, 138kV Circuit Breaker, 63kA - 2000A CTs	$232,355	$ 3,485,325
19	4000A, 345kV Circuit Breaker, 63kA -3000A CTs	$661,740	$ 12,573,060
16	4000A, 138kV Circuit Breaker, 63kA- 3000A CTs	$261,000	$ 4,176,000
		Total	$ 20,234,385
		10% Contingency	$ 2,023,439
		Contract Estimate Total	**$ 22,257,824**

- System expansion and planning are ongoing. The above chart represents the best estimate of future purchases. The proposed contract does not require expenditure of any minimum amount.

Recommendation

- Staff recommends approval of an agreement with Stuart C. Irby Co. for the purchase of high voltage circuit breakers in the not-to-exceed amount of $22,257,824.00.*

* The costs for purchase of the high voltage circuit breakers is recoverable through the Public Utility Commission (PUC) Transmission Cost of Service (TCOS) Program.

Questions?

ORDINANCE NO. _____

AN ORDINANCE OF THE CITY OF DENTON, A TEXAS HOME-RULE MUNICIPAL CORPORATION, AUTHORIZING THE CITY MANAGER TO EXECUTE A CONTRACT WITH STUART C. IRBY COMPANY, LLC, FOR THE PURCHASE OF HIGH VOLTAGE CIRCUIT BREAKERS FOR DENTON MUNICIPAL ELECTRIC; PROVIDING FOR THE EXPENDITURE OF FUNDS THEREFOR; AND PROVIDING AN EFFECTIVE DATE (RFP 8836 – AWARDED TO STUART C. IRBY COMPANY, LLC, FOR ONE (1) YEAR, WITH THE OPTION FOR FOUR (4) ADDITIONAL ONE (1) YEAR EXTENSIONS, IN THE TOTAL FIVE (5) YEAR NOT-TO-EXCEED AMOUNT OF $22,257,824.00).

WHEREAS, the City has solicited, received, and evaluated competitive proposals for the purchase of high voltage circuit breakers for Denton Municipal Electric; and

WHEREAS, the City Manager, or a designated employee, has received, reviewed, and recommended that the herein described proposals are the most advantageous to the City considering the relative importance of price and the other evaluation factors included in the request for proposals; and

WHEREAS, this procurement was undertaken as part of the City's governmental function; and

WHEREAS, the City Council has provided in the City Budget for the appropriation of funds to be used for the purchase of the materials, equipment, supplies, or services approved and accepted herein; NOW, THEREFORE,

THE COUNCIL OF THE CITY OF DENTON HEREBY ORDAINS:

SECTION 1. The items in the following numbered request for proposal for materials, equipment, supplies, or services shown in the "Request Proposals" on file in the office of the Purchasing Agent, are hereby accepted and approved as being the most advantageous to the City considering the relative importance of price and the other evaluation factors included in the request for proposals.

RFP NUMBER	CONTRACTOR	AMOUNT
8836	Stuart C. Irby Company, LLC	$22,257,824.00

SECTION 2. That by the acceptance and approval of the above numbered items of the submitted proposals, the City accepts the offer of the persons submitting the proposals for such items and agrees to purchase the materials, equipment, supplies, or services in accordance with the terms, specifications, standards, quantities, and for the specified sums contained in the Proposal Invitations, Proposals, and related documents.

SECTION 3. That should the City and person submitting approved and accepted items wish to enter into a formal written agreement as a result of the acceptance, approval, and awarding of the proposals, the City Manager, or their designated representative, is hereby authorized to execute the written contract which shall be attached hereto; provided that the written contract is in accordance with the terms, conditions, specifications, standards, quantities, and specified sums contained in the Proposal and related documents herein approved and accepted.

SECTION 4. The City Council of the City of Denton hereby expressly delegates the authority to take any actions that may be required or permitted to be performed by the City of Denton under this ordinance to the City Manager of the City of Denton, or their designee.

SECTION 5. By the acceptance and approval of the above enumerated bids, the City Council hereby authorizes the expenditure of funds therefor in the amount and in accordance with the approved bids.

SECTION 6. This ordinance shall become effective immediately upon its passage and approval.

The motion to approve this ordinance was made by _____ and seconded by _____. This ordinance was passed and approved by the following vote [___ - ___]:

	Aye	**Nay**	**Abstain**	**Absent**
Mayor Gerard Hudspeth:	_____	_____	_____	_____
Vicki Byrd, District 1:	_____	_____	_____	_____
Brian Beck, District 2:	_____	_____	_____	_____
Suzi Rumohr, District 3:	_____	_____	_____	_____
Joe Holland, District 4:	_____	_____	_____	_____
Brandon Chase McGee, At Large Place 5:	_____	_____	_____	_____
Jill Jester, At Large Place 6:	_____	_____	_____	_____

PASSED AND APPROVED this the _____ day of _____, 2025.

_____
GERARD HUDSPETH, MAYOR

ATTEST:
INGRID REX, CITY SECRETARY

BY: _____

APPROVED AS TO LEGAL FORM:
MACK REINWAND, CITY ATTORNEY

BY: Leah Bush

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Docusign City Council Transmittal Coversheet

RFP	8836
File Name	ELECTRIC UTILITY HIGH VOLTAGE CIRCUIT BREAKERS
Purchasing Contact	Crystal Westbrook
City Council Target Date	
Piggy Back Option	Yes
Contract Expiration	
Ordinance	

DS
LH

Docusign Envelope ID: 5B21F6B4-FCD2-403D-9CCB-2E9F6C7A8E03

CONTRACT BY AND BETWEEN
CITY OF DENTON, TEXAS AND STUART C. IRBY COMPANY, LLC
(Contract # 8836)

THIS CONTRACT is made and entered into this date _____, by and between Stuart C. Irby Company, LLC, a Mississippi limited liability company, whose address 7125 Belton St., Fort Worth, TX 76118, hereinafter referred to as "Contractor," and the **CITY OF DENTON, TEXAS**, a home rule municipal corporation, hereinafter referred to as "City," to be effective upon approval of the Denton City Council and subsequent execution of this Contract by the Denton City Manager or their duly authorized designee.

For and in consideration of the covenants and agreements contained herein, and for the mutual benefits to be obtained hereby, the parties agree as follows:

SCOPE OF SERVICES

Contractor shall provide products in accordance with the City's RFP #8836 Electric Utility High Voltage Circuit Breakers, a copy of which is on file at the office of Purchasing Agent and incorporated herein for all purposes. The Contract consists of this written agreement and the following items which are attached hereto, or on file, and incorporated herein by reference:

(a) Special Terms and Conditions **(Exhibit "A");**
(b) City of Denton's RFP 8836 (the "Solicitation") **(Exhibit "B" on file at the office of the Purchasing Agent**);
(c) City of Denton Standard Terms and Conditions **(Exhibit "C");**
(d) Certificate of Interested Parties Electronic Filing **(Exhibit "D");**
(e) Contractor's Proposal ("Contractor's Offer") **(Exhibit "E")**;
(f) Form CIQ – Conflict of Interest Questionnaire **(Exhibit "F")**

These documents make up the Contract documents and what is called for by one shall be as binding as if called for by all. In the event of an inconsistency or conflict in any of the provisions of the Contract documents, the inconsistency or conflict shall be resolved by giving precedence first to the written agreement then to the contract documents in the order in which they are listed above. These documents shall be referred to collectively as "Contract Documents."

Prohibition on Contracts with Companies Boycotting Israel
Contractor acknowledges that in accordance with Chapter 2271 of the Texas Government Code, City is prohibited from entering into a contract with a company for goods or services unless the contract contains a written verification from the company that it: (1) does not boycott Israel; and (2) will not boycott Israel during the term of the contract. The terms "boycott Israel" and "company" shall have the meanings ascribed to those terms in Section 808.001 of the Texas Government Code. ***By signing this Contract, Contractor certifies that Contractor's signature provides written verification to the City that Contractor: (1) does not boycott Israel; and (2) will not boycott Israel during the term of the Contract.*** Failure to meet or maintain the requirements under this provision will be considered a material breach.

Prohibition on Contracts with Companies Boycotting Certain Energy Companies
Contractor acknowledges that in accordance with Chapter 2276 of the Texas Government Code, City is prohibited from entering into a contract with a company for goods or services unless the contract contains written verification from the company that it (1) does not boycott energy companies; and (2) will not boycott

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energy companies during the term of the contract. The terms "boycott energy company" and "company" shall have the meanings ascribed to those terms in Section 809.001 of the Texas Government Code. ***By signing this agreement, Contractor certifies that Contractor's signature provides written verification to the City that Contractor: (1) does not boycott energy companies; and (2) will not boycott energy companies during the term of the Contract.*** Failure to meet or maintain the requirements under this provision will be considered a material breach.

Prohibition on Contracts with Companies Boycotting Certain Firearm Entities and Firearm Trade Associations

Contractor acknowledges that in accordance with Chapter 2274 of the Texas Government Code, City is prohibited from entering into a contract with a company for goods or services unless the contract contains written verification from the company that it (1) does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association; and (2) will not discriminate during the term of the contract against a firearm entity or firearm trade association. The terms "discriminate against a firearm entity or firearm trade association," "firearm entity" and "firearm trade association" shall have the meanings ascribed to those terms in Chapter 2274 of the Texas Government Code. ***By signing this Contract, Contractor certifies that Contractor's signature provides written verification to the City that Contractor: (1) does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association; and (2) will not discriminate during the term of this Contract against a firearm entity or firearm trade association.*** Failure to meet or maintain the requirements under this provision will be considered a material breach.

Prohibition On Contracts with Companies Doing Business with Iran, Sudan, or a Foreign Terrorist Organization

Section 2252 of the Texas Government Code restricts City from contracting with companies that do business with Iran, Sudan, or a foreign terrorist organization. ***By signing this Contract, Contractor certifies that Contractor's signature provides written verification to the City that Contractor, pursuant to Chapter 2252, is not ineligible to enter into this Contract and will not become ineligible to receive payments under this Contract by doing business with Iran, Sudan, or a foreign terrorist organization***. Failure to meet or maintain the requirements under this provision will be considered a material breach.

Termination Right for Contracts with Companies Doing Business with Certain Foreign-Owned Companies

The City of Denton may terminate this Contract immediately without any further liability if the City of Denton determines, in its sole judgment, that this Contract meets the requirements under Chapter 2275, and Contractor is, or will be in the future, (i) owned by or the majority of stock or other ownership interest of the company is held or controlled by individuals who are citizens of China, Iran, North Korea, Russia, or other designated country (ii) directly controlled by the Government of China, Iran, North Korea, Russia, or other designated country, or (iii) is headquartered in China, Iran, North Korea, Russia, or other designated country.

The parties agree to transact business electronically. Any statutory requirements that certain terms be in writing will be satisfied using electronic documents and signing. Electronic signing of this document will be deemed an original for all legal purposes.

IN WITNESS WHEREOF, the parties of these presents have executed this Contract in the year and day first above written.

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THIS CONTRACT HAS BEEN
BOTH REVIEWED AND APPROVED
as to financial and operational obligations
and business terms.

Signed by:
Antonio Puente, Jr.
E3760944C2BF4B5...

Antonio Puente, Jr.
SIGNATURE PRINTED NAME

DME General Manager
TITLE

Electric
DEPARTMENT

ATTEST:
CITY SECRETARY

BY: _____

APPROVED AS TO LEGAL FORM:
MACK REINWAND, CITY ATTORNEY

BY: DocuSigned by:
Marcella Lunn
4B070831B4AA438...

CONTRACTOR

BY: DocuSigned by:
Russell James
2ADBC7430CA44D8...
AUTHORIZED SIGNATURE

Printed Name: Russell James

Title: Inside Sales

8173214011
PHONE NUMBER

russell@irby.com
EMAIL ADDRESS

2025- 1373785
TEXAS ETHICS COMMISSION
CERTIFICATE NUMBER

CITY OF DENTON, TEXAS

BY: _____
SARA HENSLEY
CITY MANAGER

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Exhibit A
Special Terms and Conditions

1. The Quantities

The quantities indicated on Exhibit E are estimates based upon the best available information. The City reserves the right to increase or decrease the quantities to meet its actual needs without any adjustments in the bid price. Individual purchase orders will be issued on an as needed basis.

2. Product Changes During Contract Term

The Contractor shall not change specifications during the contract term without prior approval. Any deviation in the specifications or change in the product must be approved in advance by the City of Denton. Notice of a change shall be submitted in writing to purchasing@cityofdenton.com, with the above file number in the subject line, for review. Products found to have changed specifications without notification, and acceptance, will be returned at the contractor's expense. Products that have been installed will be replaced at the contractor's expense.

3. Authorized Distributor

The Contractor shall be the manufacturer or authorized distributor of the proposed products. The distributor shall be authorized to sell to the City of Denton, and make available the manufacturer's representative as needed by the City.

4. Contract Terms

The contract term will be one (1) year, effective from date of award. The City and the Contractor shall have the option to renew this contract for an additional four (4) one-year periods.

The Contract shall commence upon the issuance of a Notice of Award by the City of Denton and shall automatically renew each year, from the date of award by City Council. The Contractor's request to not renew the contract must be submitted in writing to the Purchasing Manager at least 60 days prior to the contract renewal date for each year. At the sole option of the City of Denton, the Contract may be further extended as needed, not to exceed a total of six (6) months.

5. Price Escalation and De-escalation

Price Adjustment Policy

If required, the applicable purchase and invoice price for each Product that is a High Voltage Circuit Breaker and is accepted by customer, shall be established using the following formula six (6) months or earlier before delivery of circuit breaker:

$P1 = PO * \{(0.0375 * m) + (X1/XO)\}$

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Pursuant to the foregoing formula, the Base Price for each Product that is a High Voltage Circuit Breaker shall be adjusted based on the change in the Producer Price Index for switchgear and switchboard apparatus manufacturer, not seasonally adjusted (PCU3353133335313, found at bls.gov) six (6) months or earlier before delivery of circuit breakers.

PO Initial base price from proposal / PO

P1 Adjusted price six (6) months or earlier before delivery of circuit breaker(s)

m No. of completed year from date of Supplier's proposal.

6. X1 Index value at time of price adjustment (whichever last month is published) XO Index value at time of proposal month. Total Contract Amount

The contract total shall not exceed $22,257,824.00. Pricing shall be per Exhibit E attached.

7. Delivery Lead Time

Products or services will be delivered 145-185 weeks after the receipt of order from the City.

8. Performance Liquidated Damages

If required by purchase order, Supplier agrees that it shall pay liquidated damages for failure to deliver the Goods. Beginning on the thirty first (31st) calendar day after the acknowledged delivery date by supplier and continuing until delivery of the equipment is completed, whichever is earlier, delay liquidated damages will be assessed at the rate of one half of one percent (0.5%) of the late delivery line item of equipment's price in the Purchase Order per full calendar week. The maximum cap on liquidated damages under this Article is five percent (5%) of the Purchase Order item Price that was delayed. Supplier shall pay such liquidated damages as a reasonable compensation to purchaser against documentation for delay damages and not as a penalty.

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Exhibit C
City of Denton
Standard Purchase Terms and Conditions

These standard Terms and Conditions and the Terms and Conditions, Specifications, Drawings and other requirements included in the City of Denton's contract are applicable to contracts/purchase orders issued by the City of Denton hereinafter referred to as the City or Buyer and the Seller or respondent herein after referred to as Contractor. Any deviations must be in writing and signed by a representative of the City's Procurement Department and the Contractor . No Terms and Conditions contained in the seller's proposal response, invoice, or statement shall serve to modify the terms set forth herein. If there is a conflict between the provisions on the face of the contract/purchase order these written provisions will take precedence.

The Contractor agrees that the Contract shall be governed by the following terms and conditions, unless exceptions are duly noted and fully negotiated. Unless otherwise specified in the Contract, Sections 3, 4, 5, 6, 7, 8, 20, and 21 shall apply only to a solicitation to purchase goods, and sections 9, 10, 11, and 22 shall apply only to a solicitation to purchase services to be performed principally at the City's premises or on public rights-of-way.

1. **CONTRACTOR'S OBLIGATIONS**. The Contractor shall fully and timely provide all deliverables described in the Solicitation and in the Contractor's Offer in strict accordance with the terms, covenants, and conditions of the Contract and all applicable federal, State, and local laws, rules, and regulations.

2. **EFFECTIVE DATE/TERM**. Unless otherwise specified in the Solicitation or Exhibit A, this Contract shall be effective as of the date this Contract is signed by the City and shall continue in effect until all obligations are performed in accordance with the Contract.

3. **CONTRACTOR TO PACKAGE DELIVERABLES**: The Contractor will package deliverables in accordance with good commercial practice and shall include a packing list showing the description of each item, the quantity and unit price unless otherwise provided in the Solicitation or Contractor's Offer, each shipping container shall be clearly and permanently marked as follows: (a) The Contractor's name and address, (b) the City's name, address, purchase order or purchase release number, and the price agreement number, if applicable, (c) container number and total number of containers, e.g. box 1 of 4 boxes, and (d) the number of the container bearing the packing list. The Contractor shall bear cost of packaging. Deliverables shall be suitably packed to secure lowest transportation costs and to conform to all the requirements of common carriers and any applicable specification. The City's count or weight shall be final and conclusive on shipments not accompanied by packing lists.

4. **SHIPMENT UNDER RESERVATION PROHIBITED**: The Contractor is not authorized to ship the deliverables under reservation and no tender of a bill of lading will operate as a tender of deliverables.

5. **TITLE & RISK OF LOSS**: Title to and risk of loss of the deliverables shall pass to the City only when the City actually receives and accepts the deliverables.

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6. **DELIVERY TERMS AND TRANSPORTATION CHARGES**: Deliverables shall be shipped F.O.B. point of delivery unless otherwise specified in the Solicitation or Contractor's Offer. Unless otherwise stated in the Contractor's Offer, the Contractor's price shall be deemed to include all delivery and transportation charges. The City shall have the right to designate what method of transportation shall be used to ship the deliverables. The place of delivery shall be that set forth in the purchase order.

7. **RIGHT OF INSPECTION AND REJECTION**: The City expressly reserves all rights under law, including, but not limited to the Uniform Commercial Code, to inspect the deliverables at delivery before accepting them, and to reject defective or non-conforming deliverables. If the City has the right to inspect the Contractor's, or the Contractor's Subcontractor's, facilities, or the deliverables at the Contractor's, or the Contractor's Subcontractor's, premises, the Contractor shall furnish, or cause to be furnished, without additional charge, all reasonable facilities and assistance to the City to facilitate such inspection.

8. **NO REPLACEMENT OF DEFECTIVE TENDER**: Every tender or delivery of deliverables must fully comply with all provisions of the Contract as to time of delivery, quality, and quantity. Any non-complying tender shall constitute a breach and the Contractor shall not have the right to substitute a conforming tender; provided, where the time for performance has not yet expired, the Contractor may notify the City of the intention to cure and may then make a conforming tender within the time allotted in the contract to perform but not afterward. If, instead of requiring immediate correction or removal and replacement of defective or non-conforming deliverables, the City prefers to accept it, the City may do so. The Contractor shall pay all claims, costs, losses and damages attributable to the City's evaluation of and determination to accept such defective or non-conforming deliverables. If any such acceptance occurs prior to final payment, the City may deduct such amounts as are necessary to compensate the City for the diminished value of the defective or non-conforming deliverables. If the acceptance occurs after final payment, such amount will be refunded to the City by the Contractor.

9. **PLACE AND CONDITION OF WORK**: This paragraph only applies to the purchase of services to be primarily performed at the City's premises or on City property/right-of-way. The City shall provide the Contractor access to the sites where the Contractor is to perform the services as required in order for the Contractor to perform the services in a timely and efficient manner, in accordance with and subject to the applicable security laws, rules, and regulations. The Contractor acknowledges that it has satisfied itself as to the nature of the City's service requirements and specifications, the location and essential characteristics of the work sites, the quality and quantity of materials, equipment, labor and facilities necessary to perform the services, and any other condition or state of fact which could in any way affect performance of the Contractor's obligations under the Contract. The Contractor hereby releases and holds the City harmless from and against any liability or claim for damages of any kind or nature if the actual site or service conditions differ from expected conditions.

The Contractor shall, at all times, exercise reasonable precautions for the safety of their employees, City Staff, participants and others on or near the City's facilities.

10. **WORKFORCE** This paragraph only applies to the purchase of services to be primarily performed at the City's premises or on City property/right-of-way.

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A. The Contractor shall employ only orderly and competent workers, skilled in the performance of the services which they will perform under the Contract.
B. The Contractor, its employees, Subcontractors, and Subcontractor's employees may not (1) while engaged in, participating, or responding to a solicitation; or (2) while in the course and scope of delivering goods or services under a City of Denton contract; or (3) on the City's property.

i. use or possess a firearm, including a concealed handgun that is licensed under State law, except as required by the terms of the contract; or

ii. use or possess alcoholic or other intoxicating beverages, illegal drugs, or controlled substances, nor may such workers be intoxicated, or under the influence of alcohol or drugs.

C. If the City or the City's representative notifies the Contractor that any worker is incompetent, disorderly or disobedient, has knowingly or repeatedly violated safety regulations, has possessed any firearms, or has possessed or was under the influence of alcohol or drugs, the Contractor shall immediately remove such worker from Contract services, and may not employ such worker again on Contract services without the City's prior written consent.

IMMIGRATION: THE CONTRACTOR REPRESENTS AND WARRANTS THAT IT SHALL COMPLY WITH THE REQUIREMENTS OF THE IMMIGRATION REFORM AND CONTROL ACT OF 1986 AND 1990 REGARDING EMPLOYMENT VERIFICATION AND RETENTION OF VERIFICATION FORMS FOR ANY INDIVIDUALS HIRED ON OR AFTER NOVEMBER 6, 1986, WHO WILL PERFORM ANY LABOR OR SERVICES UNDER THE CONTRACT AND THE ILLEGAL IMMIGRATION REFORM AND IMMIGRANT RESPONSIBILITY ACT OF 1996 ("IIRIRA) ENACTED ON SEPTEMBER 30, 1996, AND SHALL INDEMNIFY AND HOLD THE CITY HARMLESS FROM ANY ACTION ARISING RELATED THERETO.

11. **COMPLIANCE WITH HEALTH, SAFETY, AND ENVIRONMENTAL REGULATIONS**: This paragraph only applies to the purchase of services to be primarily performed at the City's premises or on City property/right-of-way. The Contractor, its Subcontractors, and their respective employees, shall comply fully with all applicable federal, state, and local health, safety, and environmental laws, ordinances, rules, and regulations in the performance of the services, including but not limited to those promulgated by the City and by the Occupational Safety and Health Administration (OSHA). In case of conflict, the most stringent safety requirement shall govern. **THE CONTRACTOR SHALL INDEMNIFY AND HOLD THE CITY HARMLESS FROM AND AGAINST ALL CLAIMS, DEMANDS, SUITS, ACTIONS, JUDGMENTS, FINES, PENALTIES AND LIABILITY OF EVERY KIND ARISING FROM THE BREACH OF THE CONTRACTOR'S OBLIGATIONS UNDER THIS PARAGRAPH.**

Environmental Protection: The Contractor shall be in compliance with all applicable standards, orders, or regulations issued pursuant to the mandates of the Clean Air Act (42 U.S.C. §7401 *et seq*.) and the Federal Water Pollution Control Act, as amended, (33 U.S.C. §1251 *et seq*.).

12. **INVOICES**:
A. The Contractor shall submit separate invoices on each purchase order or purchase release after each delivery. If partial shipments or deliveries are authorized by the City, a separate invoice must be sent for each shipment or delivery made.
B. **Proper Invoices must include a unique invoice number, invoice date, the purchase order number, and the master agreement number if applicable, the Department's Name, and the name of the point of contact for the Department**. Invoices shall be itemized and transportation charges, if any, shall be listed separately. A copy of the bill of lading and the freight waybill, when applicable, shall be attached to the invoice. The Contractor's name, remittance address and, if

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applicable, the tax identification number on the invoice must exactly match the information in the Vendor's registration with the City. Unless otherwise instructed in writing, the City may rely on the remittance address specified on the Contractor's invoice.

C. Invoices for labor shall include a copy of all time-sheets with trade labor rate and deliverables order number clearly identified. Invoices shall also include a tabulation of work-hours at the appropriate rates and grouped by work order number. Time billed for labor shall be limited to hours actually worked at the work site.

D. Unless otherwise expressly authorized in the Contract, the Contractor shall pass through all Subcontract and other authorized expenses at actual cost without markup.

E. Federal excise taxes, State taxes, or City sales taxes must not be included in the invoiced amount. The City will furnish a tax exemption certificate upon request.

13. **PAYMENT**:

30% of PO value with PO submission

70% of PO value after shipment per agreed incoterm

All invoices should be paid Net 30 days

A. All proper invoices need to be sent to Accounts Payable – accountspayable@cityofdenton.com. Approved invoices will be paid within thirty (30) calendar days of the invoice being received in Accounts Payable.

B. **If payment is not timely made, (per paragraph A); interest shall accrue on the unpaid balance at the lesser of the rate specified in Texas Government Code Section 2251.025 or the maximum lawful rate; except, if payment is not timely made for a reason for which the City may withhold payment hereunder, including, but not limited to, those in Paragraph D , below, interest shall not accrue until ten (10) calendar days after the grounds for withholding payment have been resolved.**

C. If partial shipments or deliveries are authorized by the City, the Contractor will be paid for the partial shipment or delivery, as stated above, provided that the invoice matches such shipment or delivery.

D. The City may withhold or set off the entire payment or part of any payment otherwise due to the Contractor to such extent as may be necessary on account of:

i. delivery of defective or non-conforming deliverables by the Contractor;

ii. third party claims, which are not covered by the insurance which the Contractor is required to provide, are filed or reasonable evidence indicating probable filing of such claims;

iii. failure of the Contractor to pay Subcontractors, or for labor, materials, or equipment;

iv. damage to the property of the City or the City's agents, employees, or contractors, which is not covered by insurance required to be provided by the Contractor;

v. reasonable evidence that the Contractor's obligations will not be completed within the time specified in the Contract, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;

vi. failure of the Contractor to submit proper invoices with purchase order number, all required attachments, and supporting documentation; or

vii. failure of the Contractor to comply with any material provision of the Contract Documents.

E. Notice is hereby given to any awarded firm who is in arrears to the City for delinquent taxes of any kind or otherwise indebted to the City that the City shall be entitled to counterclaim and/or offset against any such debt, claim, demand, or account owed to the City through payment withholding until the debt is paid in full, and no assignment of such debt, claim, demand, or

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account after the said taxes or debt are due shall affect the right of the City to offset the said taxes or debt against same.
F. Payment will be made by check unless the parties mutually agree to payment by credit card or electronic transfer of funds. The Contractor agrees that there shall be no additional charges, surcharges, or penalties to the City for payments made by credit card or electronic funds transfer.
G. The Contractor acknowledges and agrees that the awarding or continuation of this Contract is dependent upon the availability of funding. The City's payment obligations are payable only and solely from funds appropriated and available for this Contract. The absence of appropriated or other lawfully available funds shall render the Contract null and void to the extent funds are not appropriated or available and any deliverables delivered but unpaid shall be returned to the Contractor. The City will not incur a debt or obligation to pay Contractor any amounts the City does not have the current funds available to pay. The City shall provide the Contractor written notice of the failure of the City to make an adequate appropriation for any fiscal year to pay the amounts due under the Contract, or the reduction of any appropriation to an amount insufficient to permit the City to pay its obligations under the Contract. In the event of none or inadequate appropriation of funds, there will be no penalty or liability to the City, nor removal fees, cancellation fees, or the like charged to the City.
H. Down payments and/or Cancellation Charges shall be paid within thirty (30) calendar days of the invoice being received. Any down payment and/or cancellation schedules will be agreed upon at the time of bid submission.

14. **TRAVEL EXPENSES**: All travel, lodging, and per diem expenses in connection with the Contract shall be paid by the Contractor, unless otherwise stated in the Contract Documents. During the term of this Contract, the Contractor shall bill and the City shall reimburse Contractor for all reasonable and approved out of pocket expenses which are incurred in the connection with the performance of duties hereunder. Notwithstanding the foregoing, expenses for the time spent by the Contractor in traveling to and from City facilities shall not be reimbursed, unless otherwise negotiated.

15. **FINAL PAYMENT AND CLOSE-OUT**:
A. If a DBE/MBE/WBE Program Plan is agreed to and the Contractor has identified Subcontractors, the Contractor is required to submit a Contract Close-Out MBE/WBE Compliance Report to the Purchasing Manager no later than the fifteenth (15^{th}) calendar day after completion of all work under the contract. Final payment, retainage, or both may be withheld if the Contractor is not in compliance with the requirements as accepted by the City.
B. The making and acceptance of final payment will constitute:
i. a waiver of all claims by the City against the Contractor, except claims (1) which have been previously asserted in writing and not yet settled, (2) arising from defective work appearing after final inspection, (3) arising from failure of the Contractor to comply with the Contract or the terms of any warranty specified herein, (4) arising from the Contractor's continuing obligations under the Contract, including but not limited to indemnity and warranty obligations, or (5) arising under the City's right to audit; and
ii. a waiver of all claims by the Contractor against the City other than those previously asserted in writing and not yet settled.

16. **SPECIAL TOOLS & TEST EQUIPMENT**: If the price stated on the Contractor's Offer includes the cost of any special tooling or special test equipment fabricated or required by the Contractor for the purpose of filling this order, such special tooling equipment and any process

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sheets related thereto shall become the property of the City and shall be identified by the Contractor as such.

17. **RIGHT TO AUDIT**:

A. The Contractor agrees that the City shall, until the expiration of five (5) years after final payment under this Contract unless required to be retained for longer under applicable law, have electronic access to and the right to examine all books, records, and computations pertaining to this Contract. If necessary, the City shall have the right to audit and make copies of the books, records, and computations pertaining to the Contract. The Contractor shall retain such books, records, documents, and other evidence pertaining to the Contract period and five (5) years thereafter, except if an audit is in progress or audit findings are yet unresolved, in which case records shall be kept until all audit tasks are completed and resolved. These books, records, documents, and other evidence shall be available, within ten (10) business days of written request. All books and records will be made available within a fifty (50) mile radius of the City of Denton if the vendor is not able to provide electronic access. The cost of the audit will be borne by the City unless the audit reveals an overpayment of 1% or greater. If an overpayment of 1% or greater occurs, the reasonable cost of the audit, including any travel costs, must be borne by the Contractor which must be payable within five (5) business days of receipt of an invoice.

B. The Contractor further agrees to include in all its subcontracts hereunder a provision to the effect that the Subcontractor, material supplier, or other payee agrees that the City shall, until the expiration of five (5) years after final payment under the subcontract unless required to be retained for longer under applicable law, have electronic access to and the right to examine all books, records, documents, and other evidence of the Subcontractor, material supplier, or other payee involving transactions relating to the subcontract. If necessary, the City maintains the right to photocopy any physical books, documents, papers, and records of the subconsultant involving transactions relating to the subcontract. All books and records will be made available within a fifty (50) mile radius of the City of Denton. The cost of the audit will be borne by the City unless the audit reveals an overpayment of 1% or greater. If an overpayment of 1% or greater occurs, the reasonable cost of the audit, including any travel costs, must be borne by the Contractor which must be payable within five (5) business days of receipt of an invoice.

C. Failure to comply with the provisions of this section shall be a material breach of the Contract and shall constitute, in the City's sole discretion, grounds for termination thereof. Each of the terms "books", "records", "documents", and "other evidence", as used above, shall be construed to include drafts and electronic files, even if such drafts or electronic files are subsequently used to generate or prepare a final printed document.

18. **SUBCONTRACTORS**:

A. If the Contractor-identified subcontractors ("Subcontractor") in a DBE/MBE/WBE agreed-to plan (the "Plan"), the Contractor shall comply with all requirements approved by the City. The Contractor shall not initially employ any subcontractor except as provided in the Contractor's Plan. The Contractor shall not substitute any Subcontractor identified in the Plan, unless the substitute has been accepted by the City in writing. No acceptance by the City of any subcontractor shall constitute a waiver of any rights or remedies of the City with respect to defective deliverables provided by a Subcontractor. If a Plan has been approved, the Contractor is additionally required to submit a monthly Subcontract Awards and Expenditures Report to the Procurement Manager, no later than the tenth calendar day of each month.

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B. Work performed for the Contractor by a Subcontractor shall be pursuant to a written contract between the Contractor and Subcontractor. The terms of the subcontract may not conflict with the terms of the Contract Documents, and shall contain provisions that:

i. require that all deliverables to be provided by the Subcontractor be provided in strict accordance with the provisions, specifications and terms of the Contract;

ii. prohibit the Subcontractor from further subcontracting any portion of the Contract without the prior written consent of the City and the Contractor. The City may require, as a condition to such further subcontracting, that the Subcontractor post a payment bond in form, substance and amount acceptable to the City;

iii. require Subcontractors to submit all invoices and applications for payments, including any claims for additional payments, damages or otherwise, to the Contractor in sufficient time to enable the Contractor to include same with its invoice or application for payment to the City in accordance with the terms of the Contract;

iv. require that all Subcontractors obtain and maintain, throughout the term of their contract, insurance in the type and amounts specified for the Contractor, with the City being a named insured as its interest shall appear; and

v. REQUIRE THAT THE SUBCONTRACTOR INDEMNIFY AND HOLD THE CITY HARMLESS TO THE SAME EXTENT AS THE CONTRACTOR IS REQUIRED TO INDEMNIFY THE CITY.

C. The Contractor shall be fully responsible to the City for all acts and omissions of the Subcontractors just as the Contractor is responsible for the Contractor's own acts and omissions. Nothing in the Contract shall create for the benefit of any such Subcontractor any contractual relationship between the City and any such Subcontractor, nor shall it create any obligation on the part of the City to pay or to see to the payment of any moneys due any such Subcontractor except as may otherwise be required by law.

D. The Contractor shall pay each Subcontractor its appropriate share of payments made to the Contractor not later than ten (10) calendar days after receipt of payment from the City.

19. **WARRANTY-PRICE**:

A. Intentionally Omitted.

B. The Contractor certifies that the prices in the Contractor's Offer have been arrived at independently without consultation, communication, or agreement for the purpose of restricting competition, as to any matter relating to such fees with any other firm or with any competitor.

C. Intentionally Omitted.

20. **WARRANTY – TITLE**: **THE CONTRACTOR WARRANTS THAT IT HAS GOOD AND INDEFEASIBLE TITLE TO ALL DELIVERABLES FURNISHED UNDER THE CONTRACT, AND THAT THE DELIVERABLES ARE FREE AND CLEAR OF ALL LIENS, CLAIMS, SECURITY INTERESTS, AND ENCUMBRANCES. THE CONTRACTOR SHALL INDEMNIFY AND HOLD THE CITY HARMLESS FROM AND AGAINST ALL ADVERSE TITLE CLAIMS TO THE DELIVERABLES.**

21. **WARRANTY – DELIVERABLES**: The Contractor warrants and represents that all deliverables sold the City under the Contract shall be free from defects in design, workmanship, or manufacture, and conform in all material respects to the specifications, drawings, and descriptions in the Contract Documents, to any samples furnished by the Contractor, to the terms, covenants, and conditions of the Contract, and to all applicable State, federal, or local laws, rules, and regulations, and industry codes and standards. Unless otherwise stated in the Solicitation, the deliverables shall be new or recycled merchandise, and not used or reconditioned. In addition, Contractor warrants that the goods sold to City shall conform to the standards promulgated by the

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U.S. Department of Labor under the Occupational Safety and Health Act (OSHA). In the event the product does not conform to OSHA standards, City may return the product for correction or replacement at the Contractor's expense. In the event Contractor fails to make the appropriate correction within a reasonable time, correction made by City will be at Contractor's expense.

A. Recycled deliverables shall be clearly identified as such.

B. The Contractor may not limit, exclude, or disclaim the foregoing warranty or any warranty implied by law; and any attempt to do so shall be without force or effect.

C. Unless otherwise specified in the Contract or required by the Solicitation, the warranty period shall be at least one (1) year from the date of acceptance of the deliverables or from the date of acceptance of any replacement deliverables. If during the warranty period, one or more of the above warranties are breached, the Contractor shall promptly upon receipt of demand either repair the non-conforming deliverables, or replace the non-conforming deliverables with fully conforming deliverables, at the City's option and at no additional cost to the City. All costs incidental to such repair or replacement, including but not limited to, any packaging and shipping costs shall be borne exclusively by the Contractor. The City shall endeavor to give the Contractor written notice of the breach of warranty within thirty (30) calendar days of discovery of the breach of warranty, but failure to give timely notice shall not impair the City's rights under this section.

D. Intentionally Omitted.

E. If the Contractor is not the manufacturer, and the deliverables are covered by a separate manufacturer's warranty, the Contractor shall transfer and assign such manufacturer's warranty to the City. If for any reason the manufacturer's warranty cannot be fully transferred to the City, the Contractor shall assist and cooperate with the City to the fullest extent to enforce such manufacturer's warranty for the benefit of the City.

F. Contractor shall not limit, exclude, or disclaim any implied warranties, and any attempt to do so shall be without force or effect, or alternatively, at the City's option, render this Contract voidable.

22. **WARRANTY – SERVICES**:

The parties agree that the: (i) terms "services", "goods" and "work", and synonyms thereof, do not include the design, fabrication or manufacture of any goods provided hereunder; and (ii) manufacturers and sub-suppliers of such goods are not considered Contractor's subcontractors, agents, representatives, or employees hereunder.

Contractor assigns the City, effective upon passage of title, the benefits of all assignable manufacturer's warranties, and Contractor agrees to perform its responsibilities so that such warranties remain in full force and effect. Contractor will make or settle claims under such warranties directly with the manufacturer, but Contractor is not obligated to resort to litigation in connection therewith.

EXCEPT AS EXPRESSLY PROVIDED HEREIN, CONTRACTOR MAKES NO WARRANTIES, EXPRESS OR IMPLIED, RESPECTING GOODS OR SERVICES PROVIDED HEREUNDER, AND CONTRACTOR SPECIFICALLY DISCLAIMS ANY WARRANTY OF MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE, NON-INFRINGEMENT, AND ANY WARRANTY ARISING BY USAGE OF TRADE, OR COURSE OF DEALING OR PERFORMANCE. NOTWITHSTANDING ANYTHING TO THE CONTRARY HEREIN, COMPANY'S EXCLUSIVE REMEDIES FOR BREACH OF WARRANTY ARISING HEREUNDER ARE REPAIR OR REPLACEMENT OF GOODS, CORRECTION OF SERVICES, OR CREDIT OF THE PURCHASE PRICE PAID, AT COMPANY'S OPTION.

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23. **ACCEPTANCE OF INCOMPLETE OR NON-CONFORMING DELIVERABLES**: If, instead of requiring immediate correction or removal and replacement of defective or non-conforming deliverables, the City prefers to accept it, the City may do so.

24. **RIGHT TO ASSURANCE**: Whenever one party to the Contract in good faith has reason to question the other party's intent to perform, demand may be made to the other party for written assurance of the intent to perform. In the event that no assurance is given within the time specified (being a minimum of 5 days) after demand is made, the demanding party may treat this failure as an anticipatory repudiation of the Contract.

25. **STOP WORK NOTICE**: The City may issue an immediate Stop Work Notice in the event the Contractor is observed performing in a manner that is in violation of federal, State, or local guidelines, or in a manner that is determined by the City to be unsafe to either life or property. Upon notification, the Contractor will cease all work until notified by the City that the violation or unsafe condition has been corrected. The Contractor shall be liable for all costs incurred by the City as a result of the issuance of such Stop Work Notice.

26. **DEFAULT**:
A. The Contractor shall be in default under the Contract if the Contractor (a) fails to fully, timely, and faithfully perform any of its material obligations under the Contract, (b) fails to provide adequate assurance of performance under Paragraph 25, (c) becomes insolvent or seeks relief under the bankruptcy laws of the United States or (d) makes a material misrepresentation in Contractor's Offer, or in any report or deliverable required to be submitted by the Contractor to the City.
B. Intentionally Omitted.

27. **TERMINATION FOR CAUSE:** In the event of a default by the Contractor, the City shall have the right to terminate the Contract for cause, by written notice effective ten (10) calendar days, unless otherwise specified, after the date of such notice, unless the Contractor, within such ten (10) day period, cures such default, or provides evidence sufficient to prove to the City's reasonable satisfaction that such default does not, in fact, exist. In the event of a default by the Contractor, the City may remove the Contractor from the City's vendor list for three (3) years and/or any offer submitted by the Contractor may be disqualified for up to three (3) years. All rights and remedies under the Contract are cumulative and are not exclusive of any other right or remedy provided by law. The requirements of Subchapter J, Chapter 552 of the Texas Government Code, may apply to this Contract and the Contractor agrees that the Contract can be terminated if the Contractor knowingly or intentionally fails to comply with a requirement of that subchapter.

28. **TERMINATION WITHOUT CAUSE**: The City shall have the right to terminate the Contract, in whole or in part, without cause and/or for convenience any time upon thirty (30) calendar days' prior written notice. **IN THE EVENT OF A CANCELATION FOR CONVENIENCE, THE CITY SHALL BE RESPONSIBLE FOR ALL RESTOCKING AND TERMINATION FEES INCURRED BY CONTRACTOR AND THE CITY SHALL PAY THE PREVIOUSLY AGREED PURCHASE PRICE FOR ANY CUSTOM OR NON-RETURNABLE PRODUCTS AND/OR SERVICES PROVIDED AND/OR IN PROCESS.** Upon receipt of a notice of termination, the Contractor shall promptly cease all further work pursuant to the Contract, with such exceptions, if any, specified in the notice of termination. The

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City shall pay the Contractor, to the extent of funds appropriated or otherwise legally available for such purposes, for all goods delivered and services performed and obligations incurred prior to the date of termination in accordance with the terms hereof, provided such payment amount is not disputed by City. The City reserves all rights, causes of action, and remedies available under law or in equity with respect to any dispute under this Contract and a termination under this provision does not waive such rights, causes of action, and remedies.

29. **FRAUD**: Fraudulent statements by the Contractor in any offer, Contract Document, or in any report or deliverable required to be submitted by the Contractor to the City shall be grounds for the termination of the Contract for cause by the City and may result in legal action.

30. **DELAYS**:
A. The City may delay scheduled delivery or other due dates by written notice to the Contractor if the City deems it is in its best interest. If such delay causes an increase in the cost of the work under the Contract, the City and the Contractor shall negotiate an equitable adjustment for costs incurred by the Contractor in the Contract price and execute an amendment to the Contract. The Contractor must assert its right to an adjustment within thirty (30) calendar days from the date of receipt of the notice of delay. Failure to agree on any adjusted price shall be handled under the Dispute Resolution process specified in Paragraph 53. However, nothing in this provision shall excuse the Contractor from delaying the delivery as notified.
B. Neither party shall be liable for any default or delay in the performance of its obligations under this Contract if, while and to the extent such default or delay is caused by acts of God, fire, riots, civil commotion, labor disruptions, sabotage, sovereign conduct, or any other cause beyond the reasonable control of such party. In the event of default or delay in Contract performance due to any of the foregoing causes, then the time for completion of the services will be extended; provided, however, in such an event, a conference will be held within three (3) business days to establish a mutually agreeable period of time reasonably necessary to overcome the effect of such failure to perform.

31. **TIME OF COMPLETION AND LIQUIDATED DAMAGES**:
Contractor agrees and acknowledges that completing the services and/or delivering the goods described in this Contract in a timely manner is very important to the City. Contractor agrees to perform all obligations within the timeframes required. Liquidated Damages liabilities are outlined in the submission to the City prior to contract award. As it is impracticable and extremely difficult to fix the actual damages, if any, that may proximately result from a failure by Contractor to provide the goods or perform the service, should Contractor fail to timely perform its obligations, Contractor agrees to pay to City, or have withheld and offset from monies due it, the amount stated in the Contract Documents as liquidated damages for each calendar day of delay or nonperformance. Any sums due and payable hereunder by the Contractor shall be payable, not as a penalty, but as liquidated damages representing an estimate of delay damages likely to be sustained by the City, estimated at the time of executing this Contract. Execution of the Contract shall constitute agreement by the City and Contractor that said amount is the minimum value of the costs and actual damage caused by the Contractor's failure to timely perform. Adjustments to the contract times can only be made as provided in the Contract Documents and any conditions or specifications referenced therein.

32. **INDEMNITY**:
A. Definitions:

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i. “Indemnified Claims” shall include any and all claims, demands, suits, causes of action, judgments, and liability of every character, type, or description, including all reasonable costs and expenses of litigation, mediation, or other alternate dispute resolution mechanism, including attorney and other professional fees for: (1) damage to or loss of the property of any person (including, but not limited to the City, the Contractor, their respective agents, officers, employees and Subcontractors; the officers, agents, and employees of such Subcontractors; and third parties); and/or (2) death, bodily injury, illness, disease, worker’s compensation, loss of services, or loss of income or wages to any person (including but not limited to the agents, officers and employees of the City, the Contractor, the Contractor’s Subcontractors, and third parties), ii. “Fault” shall include the sale of defective or non-conforming deliverables, negligence, willful misconduct or a breach of any legally imposed strict liability standard.

B. **TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, EACH PARTY HEREBY AGREES TO INDEMNIFY, DEFEND, AND HOLD HARMLESS THE OTHER PARTY, AND ITS PARENTS AND AFFILIATES, AND ITS AND THEIR RESPECTIVE OFFICERS, DIRECTORS, AGENTS, AND EMPLOYEES, FROM AND AGAINST ANY AND ALL CLAIMS, LOSSES, DAMAGES, AND INJURIES OF ANY KIND OR CHARACTER (INCLUDING, WITHOUT LIMITATION, COURT COSTS AND REASONABLE ATTORNEYS' FEES), BUT ONLY TO THE EXTENT CAUSED BY THE NEGLIGENCE OR WILLFUL MISCONDUCT OF THE INDEMNIFYING PARTY IN CONNECTION WITH THE PERFORMANCE OF THIS AGREEMENT.**

33. **LIMITATION OF LIABILITY**: This Contract does not, and shall not be interpreted to, contain an artificial limitation of liability (e.g. liability limited to contract price or liability capped at an amount actually paid in previous 3 months, etc.) or an artificial statute of limitations (e.g. any lawsuit must be commenced within one year of the event).

34. **INSURANCE**: The Contractor shall procure and maintain insurance of the types and in the minimum amounts acceptable to the City of Denton outlined in the Insurance Exhibit attached hereto, if applicable. The insurance shall be written by a company licensed to do business in the State of Texas and satisfactory to the City of Denton. The City of Denton reserves the right to add insurance during the contract term.
B. Specific Coverage Requirements: Specific insurance requirements are contained in the Solicitation and the Insurance Exhibit.

35. **CLAIMS**: If any claim, demand, suit, or other action is asserted against the Contractor which arises under or concerns the Contract, or which could have a material adverse effect on the Contractor’s ability to perform thereunder, the Contractor shall give written notice thereof to the City within ten (10) calendar days after receipt of notice by the Contractor. Such notice to the City shall state the date of notification of any such claim, demand, suit, or other action; the names and addresses of the claimant(s); the basis thereof; and the name of each person against whom such claim is being asserted. Such notice shall be delivered personally or by mail and shall be sent to the City and to the Denton City Attorney. Personal delivery to the City Attorney shall be to City Hall, 215 East McKinney Street, Denton, Texas 76201.

36. **NOTICES**: Unless otherwise specified, all notices, requests, or other communications required or appropriate to be given under the Contract shall be in writing and shall be deemed delivered

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three (3) business days after postmarked if sent by U.S. Postal Service Certified or Registered Mail, Return Receipt Requested. Notices delivered by other means shall be deemed delivered upon receipt by the addressee. Routine communications may be made by first class mail, telefax, or other commercially accepted means. Notices to the Contractor shall be sent to the address specified in the Contractor's Offer, or at such other address as a party may notify the other in writing. Notices to the City shall be addressed to the City at 901B Texas Street, Denton, Texas 76209 and marked to the attention of the Purchasing Manager.

37. **RIGHTS TO BID, PROPOSAL AND CONTRACTUAL MATERIAL**: All material submitted by the Contractor to the City shall become property of the City upon receipt. Any portions of such material claimed by the Contractor to be proprietary must be clearly marked as such. Determination of the public nature of the material is subject to the Texas Public Information Act, Chapter 552, and Texas Government Code. The requirements of Subchapter J, Chapter 552 of the Texas Government Code, may apply to this Contract and the Contractor agrees that the Contract can be terminated if the Contractor knowingly or intentionally fails to comply with a requirement of that subchapter.

38. **INDEMNIFICATION AGAINST INFRINGEMENTS**: The Contractor represents and warrants to the City that: (i) the Contractor shall provide the City good and indefeasible title to the deliverables and (ii) the deliverables supplied by the Contractor in accordance with the specifications in the Contract will not infringe, directly or contributorily, any patent, trademark, copyright, trade secret, or any other intellectual property right of any kind of any third party; that no claims have been made by any person or entity with respect to the ownership or operation of the deliverables and the Contractor does not know of any valid basis for any such claims. Moreover, Contractor does not know of any valid basis for any such claims. **TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, EACH PARTY HEREBY AGREES TO INDEMNIFY, DEFEND, AND HOLD HARMLESS THE OTHER PARTY, AND ITS PARENTS AND AFFILIATES, AND ITS AND THEIR RESPECTIVE OFFICERS, DIRECTORS, AGENTS, AND EMPLOYEES, FROM AND AGAINST ANY AND ALL CLAIMS, LOSSES, DAMAGES, AND INJURIES OF ANY KIND OR CHARACTER (INCLUDING, WITHOUT LIMITATION, COURT COSTS AND REASONABLE ATTORNEYS' FEES), BUT ONLY TO THE EXTENT CAUSED BY THE NEGLIGENCE OR WILLFUL MISCONDUCT OF THE INDEMNIFYING PARTY IN CONNECTION WITH THE PERFORMANCE OF THIS AGREEMENT.**

39. **CONFIDENTIALITY**: In order to provide the deliverables to the City, Contractor may require access to certain of the City's and/or its licensors' confidential information (including inventions, employee information, trade secrets, confidential know-how, confidential business information, and other information which the City or its licensors consider confidential) (collectively, "Confidential Information"). Contractor acknowledges and agrees that the Confidential Information is the valuable property of the City and/or its licensors and any unauthorized use, disclosure, dissemination, or other release of the Confidential Information will substantially injure the City and/or its licensors. The Contractor (including its employees, subcontractors, agents, or representatives) agrees that it will maintain the Confidential Information in strict confidence and shall not disclose, disseminate, copy, divulge, recreate, or otherwise use the Confidential Information without the prior written consent of the City or in a manner not expressly permitted under this Contract, unless the Confidential Information is required to be

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disclosed by law or an order of any court or other governmental authority with proper jurisdiction, provided the Contractor promptly notifies the City before disclosing such information so as to permit the City reasonable time to seek an appropriate protective order. The Contractor agrees to use protective measures no less stringent than the Contractor uses within its own business to protect its own most valuable information, which protective measures shall under all circumstances be at least reasonable measures to ensure the continued confidentiality of the Confidential Information.

40. **OWNERSHIP AND USE OF DELIVERABLES**: The City shall own all rights, titles, and interests throughout the world in and to the deliverables.

A. Patents. As to any patentable subject matter contained in the deliverables, the Contractor agrees to disclose such patentable subject matter to the City. Further, if requested by the City, the Contractor agrees to assign and, if necessary, cause each of its employees to assign the entire right, title, and interest to specific inventions under such patentable subject matter to the City and to execute, acknowledge, and deliver and, if necessary, cause each of its employees to execute, acknowledge, and deliver an assignment of letters patent, in a form to be reasonably approved by the City, to the City upon request by the City.

B. Copyrights. As to any deliverables containing copyrightable subject matter, the Contractor agrees that upon their creation, such deliverables shall be considered as work made-for-hire by the Contractor for the City and the City shall own all copyrights in and to such deliverables, provided however, that nothing in this Paragraph 41 shall negate the City's sole or joint ownership of any such deliverables arising by virtue of the City's sole or joint authorship of such deliverables. Should by operation of law, such deliverables not be considered works made-for-hire, the Contractor hereby assigns to the City (and agrees to cause each of its employees providing services to the City hereunder to execute, acknowledge, and deliver an assignment to the City of) all worldwide right, title, and interest in and to such deliverables. With respect to such work made-for-hire, the Contractor agrees to execute, acknowledge, and deliver and cause each of its employees providing services to the City hereunder to execute, acknowledge, and deliver a work-made-for-hire agreement, in a form to be reasonably approved by the City, to the City upon delivery of such deliverables to the City or at such other time as the City may request.

C. Additional Assignments. The Contractor further agrees to, and if applicable, cause each of its employees to, execute, acknowledge, and deliver all applications, specifications, oaths, assignments, and all other instruments which the City might reasonably deem necessary in order to apply for and obtain copyright protection, mask work registration, trademark registration and/or protection, letters patent, or any similar rights in any and all countries and in order to assign and convey to the City, its successors, assigns and nominees, the sole and exclusive right, title, and interest in and to the deliverables. The Contractor's obligations to execute, acknowledge, and deliver (or cause to be executed, acknowledged, and delivered) instruments or papers such as those described in this Paragraph 41 A., B., and C. shall continue after the termination of this Contract with respect to such deliverables. In the event the City should not seek to obtain copyright protection, mask work registration or patent protection for any of the deliverables, but should desire to keep the same secret, the Contractor agrees to treat the same as Confidential Information under the terms of Paragraph 40 above.

41. **PUBLICATIONS**: All published material and written reports submitted under the Contract must be originally developed material unless otherwise specifically provided in the Contract. When material not originally developed is included in a report in any form, the source shall be identified.

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42. **ADVERTISING**: The Contractor shall not advertise or publish, without the City's prior consent, the fact that the City has entered into the Contract, except to the extent necessary to comply with proper requests for information from an authorized representative of the federal, State, or local government.

43. **NO CONTINGENT FEES**: The Contractor warrants that no person or selling agency has been employed or retained to solicit or secure the Contract upon any agreement or understanding for commission, percentage, brokerage, or contingent fee, excepting bona fide employees of bona fide established commercial or selling agencies maintained by the Contractor for the purpose of securing business. For breach or violation of this warranty, the City shall have the right, in addition to any other remedy available, to cancel the Contract without liability and to deduct from any amounts owed to the Contractor, or otherwise recover, the full amount of such commission, percentage, brokerage or contingent fee.

44. **GRATUITIES**: The City may, by written notice to the Contractor, cancel the Contract without liability if it is determined by the City that gratuities were offered or given by the Contractor or any agent or representative of the Contractor to any officer or employee of the City of Denton with a view toward securing the Contract or securing favorable treatment with respect to the awarding or amending or the making of any determinations with respect to the performing of such contract. In the event the Contract is canceled by the City pursuant to this provision, the City shall be entitled, in addition to any other rights and remedies, to recover or withhold the amount of the cost incurred by the Contractor in providing such gratuities.

45. **PROHIBITION AGAINST PERSONAL INTEREST IN CONTRACTS**: The Contractor agrees to comply with the conflict of interest provisions of the City of Denon Code of Ordinances and/or State law. No officer, employee, independent consultant, or elected official of the City who is involved in the development, evaluation, or decision-making process of the performance of any solicitation shall have a financial interest, direct or indirect, in the Contract resulting from that solicitation as defined in the City's Ethic Ordinance codified at Chapter 2, Article XI and in the City Charter Section 14.04, as amended. Any willful violation of this section shall constitute impropriety in office, and any officer or employee guilty thereof shall be subject to disciplinary action up to and including dismissal. Any violation of this provision, with the knowledge, expressed or implied, of the Contractor shall render the Contract voidable by the City. The Contractor shall complete and submit the City's Conflict of Interest Questionnaire. The Contractor agrees to maintain current, updated disclosure of information on file with the Procurement Department throughout the term of this Contract.

46. **NO SUBCONTRACTING BID AFTER AWARD**: Following the award of the Contract, no subcontracting except that specifically identified in the response to the Solicitation will be permitted without the express prior written consent of the City.

47. **NO GIFT OF PUBLIC PROPERTY**: The City will not agree to any terms or conditions that cause the City to lend its credit or grant public money or anything of value to the selected Contractor.

48. **INDEPENDENT CONTRACTOR**: The Contract shall not be construed as creating an employer/employee relationship, a partnership, or a joint venture. The Contractor's services shall be those of an independent contractor. The Contractor agrees and understands that the Contract

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does not grant any rights or privileges established for employees of the City of Denton, Texas for the purposes of income tax, withholding, social security taxes, vacation or sick leave benefits, worker's compensation, or any other City employee benefit. The City shall not have supervision and control of the Contractor or any employee of the Contractor, and it is expressly understood that Contractor shall perform the services hereunder according to the attached specifications at the general direction of the City Manager of the City of Denton, Texas, or their designee under this Contract. The Contractor is expressly free to advertise and perform services for other parties while performing services for the City.

49. **ASSIGNMENT-DELEGATION**: The Contract shall be binding upon and enure to the benefit of the City and the Contractor and their respective successors and assigns, provided however, that no right or interest in the Contract shall be assigned and no obligation shall be delegated by the Contractor without the prior written consent of the City. Any attempted assignment or delegation by the Contractor shall be void unless made in conformity with this Paragraph. The Contract is not intended to confer rights or benefits on any person, firm or entity not a party hereto; it being the intention of the parties that there are no third party beneficiaries to the Contract.
The Vendor shall notify the City's Purchasing Manager, in writing, of a company name, ownership, or address change for the purpose of maintaining updated City records. The president of the company or authorized official must sign the letter. A letter indicating changes in a company name or ownership must be accompanied with supporting legal documentation such as an updated W-9, documents filed with the state indicating such change, copy of the board of director's resolution approving the action, or an executed merger or acquisition agreement. Failure to do so may adversely impact future invoice payments.

50. **WAIVER**: No claim or right arising out of a breach of the Contract can be discharged in whole or in part by a waiver or renunciation of the claim or right unless the waiver or renunciation is supported by consideration and is in writing signed by the aggrieved party. No waiver by either the Contractor or the City of any one or more events of default by the other party shall operate as, or be construed to be, a permanent waiver of any rights or obligations under the Contract, or an express or implied acceptance of any other existing or future default or defaults, whether of a similar or different character. No delay, failure, or waiver of either party's exercise or partial exercise of any right or remedy under the Contract shall operate to limit, impair, preclude, cancel, waive or otherwise affect such right or remedy.

51. **MODIFICATIONS**: The Contract can be modified or amended only by a writing signed by both parties. No pre-printed or similar terms on any the Contractor invoice, order or other document submitted to the City by Contractor shall have any force or effect to change the terms, covenants, and conditions of the Contract.

52. **INTERPRETATION**: The Contract is intended by the parties as a final, complete and exclusive statement of the terms of their agreement. No course of prior dealing between the parties or course of performance or usage of the trade shall be relevant to supplement or explain any term used in the Contract. Acceptance or acquiescence in a course of performance rendered under this Contract shall not be relevant to determine the meaning of this agreement even though the accepting or acquiescing party has knowledge of the performance and opportunity for objection. Although the Contract may have been substantially drafted by one party, it is the intent of the parties that all provisions be construed in a manner to be fair to both parties, reading no provisions

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more strictly against one party or the other. Whenever a term defined by the Uniform Commercial Code, as enacted by the State of Texas, is used in the Contract, the UCC definition shall control, unless otherwise defined in the Contract.

53. **DISPUTE RESOLUTION**:
A. If a dispute arises out of or relates to the Contract, or the breach thereof, the parties agree to negotiate prior to prosecuting a suit for damages. However, this section does not prohibit the filing of a lawsuit to toll the running of a statute of limitations or to seek injunctive relief. Either party may make a written request for a meeting between representatives of each party within fourteen (14) calendar days after receipt of the request or such later period as agreed by the parties. Each party shall include, at a minimum, one (1) senior level individual with decision-making authority regarding the dispute, however any decision requiring approval of the City Council of the City will be required to be submitted to the City Council and the senior level person shall have authority to recommend approval of any resolution. The purpose of this and any subsequent meeting is to attempt in good faith to negotiate a resolution of the dispute. If, within thirty (30) calendar days after such meeting, the parties have not succeeded in negotiating a resolution of the dispute, they will proceed directly to mediation as described below. Negotiation may be waived by a written agreement signed by both parties, in which event the parties may proceed directly to mediation as described below.
B. If the efforts to resolve the dispute through negotiation fail, or the parties waive the negotiation process, the parties may select, within thirty (30) calendar days, a mediator trained in mediation skills to assist with resolution of the dispute. Should they choose this option; the City and the Contractor agree to act in good faith in the selection of the mediator and to give consideration to qualified individuals nominated to act as mediator. Nothing in the Contract prevents the parties from relying on the skills of a person who is trained in the subject matter of the dispute or a contract interpretation expert. If the parties fail to agree on a mediator within thirty (30) calendar days of initiation of the mediation process, the mediator shall be selected by the Denton County Alternative Dispute Resolution Program (DCAP). The parties agree to participate in mediation in good faith for up to thirty (30) calendar days from the date of the first mediation session. The City and the Contractor will share the mediator's fees equally and the parties will bear their own costs of participation such as fees for any consultants or attorneys they may utilize to represent them or otherwise assist them in the mediation.
C. The parties shall not be required to submit to binding arbitration.

54. **JURISDICTION AND VENUE**: The Contract is made under and shall be governed by the laws of the State of Texas, including, when applicable, the Uniform Commercial Code as adopted in Texas, V.T.C.A., Bus. & Comm. Code, Chapter 1, excluding any rule or principle that would refer to and apply the substantive law of another state or jurisdiction. All issues arising from this Contract shall be resolved in the courts of Denton County, Texas and the parties agree to submit to the exclusive personal jurisdiction of such courts. The foregoing, however, shall not be construed or interpreted to limit or restrict the right or ability of the City to seek and secure injunctive relief from any competent authority as contemplated herein.

55. **INVALIDITY**: The invalidity, illegality, or unenforceability of any provision of the Contract shall in no way affect the validity or enforceability of any other portion or provision of the Contract. Any void provision shall be deemed severed from the Contract and the balance of the Contract shall be construed and enforced as if the Contract did not contain the particular portion or provision held to be void. The parties further agree to reform the Contract to replace any stricken

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provision with a valid provision that comes as close as possible to the intent of the stricken provision. The provisions of this section shall not prevent this entire Contract from being void should a provision which is the essence of the Contract be determined to be void.

56. **HOLIDAYS:** The following holidays are observed by the City:

New Year's Day (observed)
Martin Luther King, Jr. Day
Memorial Day
Juneteenth
Independence Day
Labor Day
Veteran's Day
Thanksgiving Day
Friday After Thanksgiving
Christmas Eve (observed)
Christmas Day (observed)

If a Legal Holiday falls on Saturday, it will be observed on the preceding Friday. If a Legal Holiday falls on Sunday, it will be observed on the following Monday. Normal hours of operation shall be between 8:00 am and 4:00 pm, Monday through Friday, excluding City of Denton Holidays. Any scheduled deliveries or work performance not within the normal hours of operation **must be approved** by the City Manager of Denton, Texas or their authorized designee.

57. **SURVIVABILITY OF OBLIGATIONS:** All provisions of the Contract that impose continuing obligations on the parties, including but not limited to the warranty, indemnity, and confidentiality obligations of the parties, shall survive the expiration or termination of the Contract for fifteen (15) years.

58. **NON-SUSPENSION OR DEBARMENT CERTIFICATION:**
The City of Denton is prohibited from contracting with or making prime or sub-awards to parties that are suspended or debarred or whose principals are suspended or debarred from Federal, State, or City of Denton Contracts. By accepting a Contract with the City, the Vendor certifies that its firm and its principals are not currently suspended or debarred from doing business with the Federal Government, as indicated by the General Services Administration List of Parties Excluded from Federal Procurement and Non-Procurement Programs, the State of Texas, or the City of Denton.

59. **EQUAL OPPORTUNITY** Contractor agrees that during the performance of its contract it will:
A. Treat all applicants and employees without discrimination as to race, color, religion, sex, national origin, marital status, age, or handicap.
B. Identify itself as an "Equal Opportunity Employer" in all help wanted advertising or request.
The Contractor shall be advised of any complaints filed with the City alleging that Contractor is not an Equal Opportunity Employer. The City reserves the right to consider its reports from its human relations administrator in response to such complaints in determining whether or not to terminate any portion of this contract for which purchase orders or authorities to deliver have not been included, however, the Contractor is specifically advised that no Equal Opportunity

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Employment complaint will be the basis for cancellation of this contract for which a purchase order has been issued or authority to deliver granted.
C. **Americans with Disabilities Act (ADA) Compliance:** No Contractor, or Contractor's agent, shall engage in any discriminatory employment practice against individuals with disabilities as defined
in the ADA.

60. **BUY AMERICAN ACT-SUPPLIES (Applicable to certain federally funded requirements)**
The following federally funded requirements are applicable. A. Definitions. As used in this paragraph –
i. "Component" means an article, material, or supply incorporated directly into an end product.
ii. "Cost of components" means -
(1) For components purchased by the Contractor, the acquisition cost, including transportation costs to the place of incorporation into the end product (whether or not such costs are paid to a domestic firm), and any applicable duty (whether or not a duty-free entry certificate is issued); or
(2) For components manufactured by the Contractor, all costs associated with the manufacture of the component, including transportation costs as described in paragraph (1) of this definition, plus allocable overhead costs, but excluding profit. Cost of components does not include any costs associated with the manufacture of the end product.
iii. "Domestic end product" means-
(1) An unmanufactured end product mined or produced in the United States; or
(2) An end product manufactured in the United States, if the cost of its components mined, produced, or manufactured in the United States exceeds 50 percent of the cost of all its components. Components of foreign origin of the same class or kind as those that the agency determines are not mined, produced, or manufactured in sufficient and reasonably available commercial quantities of a satisfactory quality are treated as domestic. Scrap generated, collected, and prepared for processing in the United States is considered domestic.
iv. "End product" means those articles, materials, and supplies to be acquired under the contract for public use.
v. "Foreign end product" means an end product other than a domestic end product.
vi. "United States" means the 50 States, the District of Columbia, and outlying areas.
B. The Buy American Act (41 U.S.C. 10a - 10d) provides a preference for domestic end products for supplies acquired for use in the United States.
C. The City does not maintain a list of foreign articles that will be treated as domestic for this Contract; but will consider for approval foreign articles as domestic for this product if the articles are on a list approved by another Governmental Agency. The Contractor shall submit documentation with their offer demonstrating that the article is on an approved Governmental list.
D. The Contractor shall deliver only domestic end products except to the extent that it specified delivery of foreign end products in the provision of the Solicitation entitled "Buy American Act Certificate".

61. **RIGHT TO INFORMATION:** The City of Denton reserves the right to use any and all information presented in any response to this Contract, whether amended or not, except as prohibited by law. Selection of rejection of the submittal does not affect this right.

62. **LICENSE FEES OR TAXES:** Provided the solicitation requires an awarded contractor or supplier to be licensed by the State of Texas, any and all fees and taxes are the responsibility of the

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respondent.

63. **PREVAILING WAGE RATES:** The Contractor shall comply with prevailing wage rates as defined by the United States Department of Labor Davis-Bacon Wage Determination at http://www.dol.gov/whd/contracts/dbra.htm and at the Wage Determinations website www.wdol.gov for Denton County, Texas (WD-2509).

64. **COMPLIANCE WITH ALL STATE, FEDERAL, AND LOCAL LAWS:** The Contractor or supplier shall comply with all State, federal, and local laws and requirements. The Contractor must comply with all applicable laws at all times, including, without limitation, the following: (i) §36.02 of the Texas Penal Code, which prohibits bribery; (ii) §36.09 of the Texas Penal Code, which prohibits the offering or conferring of benefits to public servants; and (iii) Chapter 552 of the Texas Government Code, which outlines policy for public information. The Contractor shall give all notices and comply with all laws and regulations applicable to furnishing and performance of the Contract.

65. **FEDERAL, STATE, AND LOCAL REQUIREMENTS:** Contractor shall demonstrate on-site compliance with the provisions of federal law dealing with issuance of Form W-2's to common law employees. Contractor is responsible for both federal and State unemployment insurance coverage and standard Workers' Compensation insurance coverage. Contractor shall ensure compliance with all federal and State tax laws and withholding requirements. The City of Denton shall not be liable to Contractor or its employees for any Unemployment or Workers' Compensation coverage, or federal or State withholding requirements. Contractor shall indemnify the City of Denton and shall pay all costs, penalties, or losses resulting from Contractor's omission or breach of this Section.

66. **ATTORNEY'S FEES; LEGAL COSTS:** Contractor and City agree that the City will not be required to pay Contractor's attorney's fees or legal costs under any circumstances, unless expressly required by law.

67. **DRUG FREE WORKPLACE:** The Contractor shall comply with the applicable provisions of the Drug-Free Work Place Act of 1988 (Public Law 100-690, Title V, Subtitle D; 41 U.S.C. 701 ET SEQ.) and maintain a drug-free work environment; and the final rule, government-wide requirements for drug-free work place (grants), issued by the Office of Management and Budget and the Department of Defense (32 CFR Part 280, Subpart F) to implement the provisions of the Drug-Free Work Place Act of 1988 is incorporated by reference and the Contractor shall comply with the relevant provisions thereof, including any amendments to the final rule that may hereafter be issued.

68. **CONTRACTOR LIABILITY FOR DAMAGE TO GOVERNMENT PROPERTY:** The Contractor shall be liable for all damages to government-owned, leased, or occupied property and equipment caused by the Contractor and its employees, agents, subcontractors, and suppliers, including any delivery or cartage company, in connection with any performance pursuant to the Contract. The Contractor shall notify the City of Denton Procurement Manager in writing of any such damage within one (1) calendar day.

69. **FORCE MAJEURE:** The City of Denton, any Customer, and the Contractor shall not be responsible for performance under the Contract should it be prevented from performance by an act

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of war, order of legal authority, act of God, or other unavoidable cause not attributable to the fault or negligence of the City of Denton. In the event of an occurrence under this Section, the Contractor will be excused from any further performance or observance of the requirements so affected for as long as such circumstances prevail and the Contractor continues to use commercially reasonable efforts to recommence performance or observance whenever and to whatever extent possible without delay. The Contractor shall immediately notify the City of Denton Procurement Manager by telephone (to be confirmed in writing within five (5) calendar days of the inception of such occurrence) and describe at a reasonable level of detail the circumstances causing the non-performance or delay in performance.

70. **NON-WAIVER OF RIGHTS:** Failure of a Party to require performance by another Party under the Contract will not affect the right of such Party to require performance in the future. No delay, failure, or waiver of either Party's exercise or partial exercise of any right or remedy under the Contract shall operate to limit, impair, preclude, cancel, waive or otherwise affect such right or remedy. A waiver by a Party of any breach of any term of the Contract will not be construed as a waiver of any continuing or succeeding breach.

71. **NO WAIVER OF SOVEREIGN IMMUNITY:** The Parties expressly agree that no provision of the Contract is in any way intended to constitute a waiver by the City of Denton of any immunities from suit or from liability that the City of Denton may have by operation of law.

72. **RECORDS RETENTION:** The Contractor shall retain all financial records, supporting documents, statistical records, and any other records or books relating to the performances called for in the Contract. The Contractor shall retain all such records for a period of four (4) years after the expiration of the Contract, or until the CPA or State Auditor's Office is satisfied that all audit and litigation matters are resolved, whichever period is longer. The Contractor shall grant access to all books, records and documents pertinent to the Contract to the CPA, the State Auditor of Texas, and any federal governmental entity that has authority to review records due to federal funds being spent under the Contract. In the event the value of this Contract is One Million ($1,000,000) Dollars or greater: (i) all contracting information related to this contract will be preserved for the duration of the Contact; (ii) the Contractor shall provide any contracting information in its possession promptly upon request by the City; and (iii) at the expiration of this Contract, the Contractor will either provide all contracting information in its possession to the City or preserve same as required by the record retention requirements of the State of Texas.

73. **PROCUREMENT LAWS**: The City will not agree to any terms or conditions that cause the City to violate any federal, State, or local procurement laws, including its own Charter or Procurement Policy and any such laws included in boilerplate terms, online terms or other terms provided by the Contractor are considered null and void.

74. **AUTHORITY**: Contractor represents and warrants to the other that (a) it has company authority to execute and perform this Contract; (b) executing this Contract does not constitute a material conflict with, breach, or default under any applicable law, its respective organizational documents, or any documents, agreements, contracts or instruments which are binding upon it; and (c) this Contract creates valid, legal, and binding obligation enforceable against it, subject to applicable insolvency and bankruptcy laws. Contractor recognizes and agrees that a violation of this provision constitutes a material breach under this Contract.

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Exhibit D

Certificate of Interested Parties Electronic Filing

In 2015, the Texas Legislature adopted House Bill 1295, which added section 2252.908 of the Government Code. The law states that the City may not enter into this contract unless the Contractor submits a disclosure of interested parties (Form 1295) to the City at the time the Contractor submits the signed contract. The Texas Ethics Commission has adopted rules requiring the business entity to file Form 1295 electronically with the Commission.

Contractor will be required to furnish a Certificate of Interest Parties before the Contract is awarded, in accordance with Government Code 2252.908.

The Contractor shall:

1. Log onto the State Ethics Commission Website at : https://www.ethics.state.tx.us/whatsnew/elf_info_form1295.htm
2. Register utilizing the tutorial provided by the State
3. Print a copy of the completed Form 1295
4. Enter the Certificate Number on page 2 of this contract.
5. Complete and sign the Form 1295
6. Email the form to purchasing@cityofdenton.com with the contract number in the subject line. (EX: Contract 1234 – Form 1295)

The City must acknowledge the receipt of the filed Form 1295 not later than the 30th day after Council award. Once a Form 1295 is acknowledged, it will be posted to the Texas Ethics Commission's website within seven business days.

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EXHIBIT E

Line #	Description	Mfgr	QTY	UOM	Stuart C. Irby
SECTION I - CIRCUIT BREAKERS - SIEMENS					
2	3000A, 138kV Circuit Breaker, 40kA	SIEMENS	2	EA	$154,783.00
3	3000A, 138kV Circuit Breaker, 63kA	SIEMENS	10	EA	$233,355.00
4	4000A, 138kV Circuit Breaker, 63kA (12 BCTs -2000:5)	SIEMENS	12	EA	$255,625.00
5	4000A, 345kV Circuit Breaker, 63kA (12 BCTs -3000:5)	SIEMENS	8	EA	$661,740.00
6	4000A, 138kV Circuit Breaker, 63kA (12 BCTs -3000:5)	SIEMENS	1	EA	$261,000.00
SECTION II - CIRCUIT BREAKERS - MITSUBISHI					
7	3000A, 138kV Circuit Breaker, 40kA	MITSUBISH	2	EA	No Bid
8	3000A, 138kV Circuit Breaker, 50kA	MITSUBISH	10	EA	No Bid
9	4000A, 138kV Circuit Breaker, 50kA	MITSUBISH	12	EA	No Bid
10	4000A, 345kV Circuit Breaker, 50kA	MITSUBISH	8	EA	No Bid
SECTION III - 61850 OPTION					
12	Add (2) SEL-421 Merging Units with Wiring as shown in Spec.		12	Per Breaker	No Bid
SECTION IV - MAINTENANCE PARTS					
14	Y-Relay		1	EA	$720.00
15	Close Coil		1	EA	$610.00
16	Trip Coil		1	EA	$610.00
17	Charging Motor		1	EA	$1,330.00
18	Cabinet Heater		3	EA	No Bid
SECTION V - RECOMMENDED SPARE PARTS					
20	Porcelain Bushings (145kV)		1	EA	$2,160.00

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EXHIBIT F

CONFLICT OF INTEREST QUESTIONNAIRE - FORM CIQ

For vendor or other person doing business with local governmental entity

This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code, by a vendor who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the vendor meets requirements under Section 176.006(a) and by City of Denton Ethics Code, Ordinance 18-757.
By law this questionnaire must be filed with the records administrator of the local government entity not later than the 7th business day after the date the vendor becomes aware of facts that require the statement to be filed. *See* Section 176.006(a-1), Local Government Code.

A vendor commits an offense if the vendor knowingly violates Section 176.006, Local Government Code. An offense under this section is a misdemeanor.

1 **Name of vendor who has a business relationship with local governmental entity.**

STUART C. IRBY COMPANY, LLC

2 ☐ **Check this box if you are filing an update to a previously filed questionnaire.**

(The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date on which you became aware that the originally filed questionnaire was incomplete or inaccurate.)

3 **Name of local government officer about whom the information in this section is being disclosed.**

none

Name of Officer

Describe each employment or other business relationship with the local government officer, or a family member of the officer, as described by Section 176.003(a)(2)(A). Also describe any family relations hip with the local government officer. This section, (item 3 including subparts A, B, C & D), must be completed for each officer with whom the vendor has an employment or other business relationship as defined by Section 176.001(1-a), Local Government Code. Attach additional pages to this Form CIQ as necessary.

A. Is the local government officer named in this section receiving or likely to receive taxable income, other than investment income, from the vendor?

☐ Yes ☒ No

B. Is the vendor receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer named in this section AND the taxable income is not received from the local governmental entity?

☐ Yes ☒ No

C. Is the filer of this questionnaire employed by a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership of one percent or more?

☐ Yes ☒ No

D. Describe each employment or business and family relationship with the local government officer named in this section.

4 ☒ **I have no Conflict of Interest to disclose.**

5 DocuSigned by:

Russell James

2ADBC7430CA44D8...

Signature of vendor doing business with the governmental entity

11/19/2025

Date

Docusign Envelope ID: 5B21F6B4-FCD2-403D-9CCB-2E9F6C7A8E03

CONFLICT OF INTEREST QUESTIONNAIRE
For vendor doing business with local governmental entity

A complete copy of Chapter 176 of the Local Government Code may be found at http://www.statutes.legis.state.tx.us/ Docs/LG/htm/LG.176.htm. For easy reference, below are some of the sections cited on this form.

Local Government Code § 176.001(1-a): "Business relationship" means a connection between two or more parties based on commercial activity of one of the parties. The term does not include a connection based on:

(A) a transaction that is subject to rate or fee regulation by a federal, state, or local governmental entity or an agency of a federal, state, or local governmental entity;

(B) a transaction conducted at a price and subject to terms available to the public; or

(C) a purchase or lease of goods or services from a person that is chartered by a state or federal agency and that is subject to regular examination by, and reporting to, that agency.

Local Government Code § 176.003(a)(2)(A) and (B):

(A) A local government officer shall file a conflicts disclosure statement with respect to a vendor if:

(2) the vendor:

(A) has an employment or other business relationship with the local government officer or a family member of the officer that results in the officer or family member receiving taxable income, other than investment income, that exceeds $2,500 during the 12-month period preceding the date that the officer becomes aware that

(i) a contract between the local governmental entity and vendor has been executed; or

(ii) the local governmental entity is considering entering into a contract with the vendor;

(B) has given to the local government officer or a family member of the officer one or more gifts that have an aggregate value of more than $100 in the 12-month period preceding the date the officer becomes aware that:

(i) a contract between the local governmental entity and vendor has been executed; or

(ii) the local governmental entity is considering entering into a contract with the vendor.

Local Government Code § 176.006(a) and (a-1)

(a) A vendor shall file a completed conflict of interest questionnaire if the vendor has a business relationship with a local governmental entity and:

(1) has an employment or other business relationship with a local government officer of that local governmental entity, or a family member of the officer, described by Section 176.003(a)(2)(A);

(2) has given a local government officer of that local governmental entity, or a family member of the officer, one or more gifts with the aggregate value specified by Section 176.003(a)(2)(B), excluding any gift described by Section 176.003(a-1); or

(3) has a family relationship with a local government officer of that local governmental entity.

(a-1) The completed conflict of interest questionnaire must be filed with the appropriate records administrator not later than the seventh business day after the later of:

(1) the date that the vendor:

(A) begins discussions or negotiations to enter into a contract with the local governmental entity; or

(B) submits to the local governmental entity an application, response to a request for proposals or bids, correspondence, or another writing related to a potential contract with the local governmental entity; or

(2) the date the vendor becomes aware:

(A) of an employment or other business relationship with a local government officer, or a family member of the officer, described by Subsection (a);

(B) that the vendor has given one or more gifts described by Subsection (a); or

(C) of a family relationship with a local government officer.

City of Denton Ethics Code Ordinance Number 18-757

Definitions:

Relative: a family member related to a City Official within the third 3rd degree of affinity (marriage) or consanguinity (blood or adoption)

City Official: for purpose of this article, the term consists of the Council Members, Department Heads, or member of the Board of Ethics, Planning and zoning Commission Members, Board of Adjustment, Historic Landmark Commission, or Public Utilities Board

Vendor: a person who provides or seeks to provide goods, services, and/or real property to the City in exchange for compensation. This definition does not include those property owners from whom the City acquires public right-of-way or other real property interests for public use.

Per the City of Denton Ethics Code, Section 2-273. – Prohibitions

(3) It shall be a violation of this Article for a Vendor to offer or give a Gift to City Official exceeding fifty dollars ($50.00) per gift, or multiple gifts cumulatively valued at more than two hundred dollars ($200.00) per a single fiscal year.

Per the City of Denton Ethics Code, Section 2-282. – Disposition (b), (5) Ineligibility

If the Board of Ethics finds that a Vendor has violated this Article, the Board may recommend to the City Manager that the Vendor be deemed ineligible to enter into a City contract or other arrangement for goods, services, or real property, for a period of one (1) year.

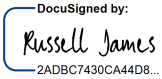
Certificate Of Completion

Envelope Id: 5B21F6B4-FCD2-403D-9CCB-2E9F6C7A8E03
Status: Sent
Subject: Please DocuSign: City Council Contract 8836 Electric Utility High Voltage Circuit Breakers
Source Envelope:
Document Pages: 30
Signatures: 4
Certificate Pages: 6
Initials: 1
AutoNav: Enabled
EnvelopeId Stamping: Enabled
Time Zone: (UTC-06:00) Central Time (US & Canada)

Envelope Originator:
Crystal Westbrook
901B Texas Street
Denton, TX 76209
crystal.westbrook@cityofdenton.com
IP Address: 198.49.140.10

Record Tracking

Status: Original
11/18/2025 8:58:13 AM
Holder: Crystal Westbrook
crystal.westbrook@cityofdenton.com
Location: DocuSign

Signer Events	Signature	Timestamp
Crystal Westbrook crystal.westbrook@cityofdenton.com Senior Buyer City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign	**Completed** Using IP Address: 198.49.140.10	Sent: 11/18/2025 8:58:58 AM Viewed: 11/18/2025 8:59:11 AM Signed: 11/18/2025 9:01:58 AM
Lori Hewell lori.hewell@cityofdenton.com Purchasing Manager City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign	 Signature Adoption: Pre-selected Style Using IP Address: 198.49.140.10	Sent: 11/18/2025 9:02:01 AM Viewed: 11/18/2025 9:07:06 AM Signed: 11/18/2025 9:07:28 AM
Marcella Lunn marcella.lunn@cityofdenton.com Senior Deputy City Attorney City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign	 Signature Adoption: Pre-selected Style Using IP Address: 198.49.140.10	Sent: 11/18/2025 9:07:31 AM Viewed: 11/18/2025 2:57:01 PM Signed: 11/18/2025 3:09:29 PM
Russell James russell@irby.com Inside Sales Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Accepted: 11/19/2025 4:17:32 PM ID: 7fe80ff0-8027-4fe6-b3a1-177a9af00890	 Signature Adoption: Pre-selected Style Using IP Address: 170.85.100.94	Sent: 11/18/2025 3:09:36 PM Viewed: 11/19/2025 4:17:32 PM Signed: 11/19/2025 4:26:09 PM

Signer Events	Signature	Timestamp
Antonio Puente, Jr. antonio.puente@cityofdenton.com DME General Manager Denton Municipal Electric Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Accepted: 11/19/2025 4:58:31 PM ID: 451b201d-8f2d-478b-bc81-72e582ae17dc	Signed by: E3760944C2BF4B5... Signature Adoption: Pre-selected Style Using IP Address: 198.49.140.10	Sent: 11/19/2025 4:26:12 PM Viewed: 11/19/2025 4:58:31 PM Signed: 11/19/2025 4:58:45 PM
Cheyenne Defee cheyenne.defee@cityofdenton.com Procurement Administration Supervisor City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign		Sent: 11/19/2025 4:58:49 PM
Sara Hensley sara.hensley@cityofdenton.com Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign		
Ingrid Rex ingrid.rex@cityofdenton.com Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign		

In Person Signer Events	Signature	Timestamp

Editor Delivery Events	Status	Timestamp

Agent Delivery Events	Status	Timestamp

Intermediary Delivery Events	Status	Timestamp

Certified Delivery Events	Status	Timestamp

Carbon Copy Events	Status	Timestamp
Cheyenne Defee cheyenne.defee@cityofdenton.com Procurement Administration Supervisor City of Denton Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via Docusign	COPIED	Sent: 11/18/2025 9:02:01 AM
Gretna Jones gretna.jones@cityofdenton.com Legal Secretary City of Denton Security Level: Email, Account Authentication (None)	COPIED	Sent: 11/19/2025 4:58:48 PM Viewed: 11/20/2025 9:49:34 AM

Carbon Copy Events	Status	Timestamp
Electronic Record and Signature Disclosure: Not Offered via Docusign		
City Secretary Office citysecretary@cityofdenton.com Security Level: Email, Account Authentication (None)		
Electronic Record and Signature Disclosure: Not Offered via Docusign		
Mark Zimmerer mark.zimmerer@cityofdenton.com Security Level: Email, Account Authentication (None)		
Electronic Record and Signature Disclosure: Accepted: 11/12/2025 7:54:20 AM ID: 55b44345-9d3d-4394-9665-b2279025dbae		

Witness Events	Signature	Timestamp

Notary Events	Signature	Timestamp

Envelope Summary Events	Status	Timestamps
Envelope Sent	Hashed/Encrypted	11/18/2025 8:58:58 AM

Payment Events	Status	Timestamps

Electronic Record and Signature Disclosure

ELECTRONIC RECORD AND SIGNATURE DISCLOSURE

From time to time, City of Denton (we, us or Company) may be required by law to provide to you certain written notices or disclosures. Described below are the terms and conditions for providing to you such notices and disclosures electronically through your DocuSign, Inc. (DocuSign) Express user account. Please read the information below carefully and thoroughly, and if you can access this information electronically to your satisfaction and agree to these terms and conditions, please confirm your agreement by clicking the 'I agree' button at the bottom of this document.

Getting paper copies

At any time, you may request from us a paper copy of any record provided or made available electronically to you by us. For such copies, as long as you are an authorized user of the DocuSign system you will have the ability to download and print any documents we send to you through your DocuSign user account for a limited period of time (usually 30 days) after such documents are first sent to you. After such time, if you wish for us to send you paper copies of any such documents from our office to you, you will be charged a $0.00 per-page fee. You may request delivery of such paper copies from us by following the procedure described below.

Withdrawing your consent

If you decide to receive notices and disclosures from us electronically, you may at any time change your mind and tell us that thereafter you want to receive required notices and disclosures only in paper format. How you must inform us of your decision to receive future notices and disclosure in paper format and withdraw your consent to receive notices and disclosures electronically is described below.

Consequences of changing your mind

If you elect to receive required notices and disclosures only in paper format, it will slow the speed at which we can complete certain steps in transactions with you and delivering services to you because we will need first to send the required notices or disclosures to you in paper format, and then wait until we receive back from you your acknowledgment of your receipt of such paper notices or disclosures. To indicate to us that you are changing your mind, you must withdraw your consent using the DocuSign 'Withdraw Consent' form on the signing page of your DocuSign account. This will indicate to us that you have withdrawn your consent to receive required notices and disclosures electronically from us and you will no longer be able to use your DocuSign Express user account to receive required notices and consents electronically from us or to sign electronically documents from us.

All notices and disclosures will be sent to you electronically

Unless you tell us otherwise in accordance with the procedures described herein, we will provide electronically to you through your DocuSign user account all required notices, disclosures, authorizations, acknowledgements, and other documents that are required to be provided or made available to you during the course of our relationship with you. To reduce the chance of you inadvertently not receiving any notice or disclosure, we prefer to provide all of the required notices and disclosures to you by the same method and to the same address that you have given us. Thus, you can receive all the disclosures and notices electronically or in paper format through the paper mail delivery system. If you do not agree with this process, please let us know as described below. Please also see the paragraph immediately above that describes the consequences of your electing not to receive delivery of the notices and disclosures electronically from us.

How to contact City of Denton:
You may contact us to let us know of your changes as to how we may contact you electronically, to request paper copies of certain information from us, and to withdraw your prior consent to receive notices and disclosures electronically as follows:
To contact us by email send messages to: purchasing@cityofdenton.com

To advise City of Denton of your new e-mail address
To let us know of a change in your e-mail address where we should send notices and disclosures electronically to you, you must send an email message to us at melissa.kraft@cityofdenton.com and in the body of such request you must state: your previous e-mail address, your new e-mail address. We do not require any other information from you to change your email address..
In addition, you must notify DocuSign, Inc to arrange for your new email address to be reflected in your DocuSign account by following the process for changing e-mail in DocuSign.

To request paper copies from City of Denton
To request delivery from us of paper copies of the notices and disclosures previously provided by us to you electronically, you must send us an e-mail to purchasing@cityofdenton.com and in the body of such request you must state your e-mail address, full name, US Postal address, and telephone number. We will bill you for any fees at that time, if any.

To withdraw your consent with City of Denton
To inform us that you no longer want to receive future notices and disclosures in electronic format you may:

i. decline to sign a document from within your DocuSign account, and on the subsequent page, select the check-box indicating you wish to withdraw your consent, or you may;
ii. send us an e-mail to purchasing@cityofdenton.com and in the body of such request you must state your e-mail, full name, IS Postal Address, telephone number, and account number. We do not need any other information from you to withdraw consent.. The consequences of your withdrawing consent for online documents will be that transactions may take a longer time to process..

Required hardware and software

Operating Systems:	Windows2000? or WindowsXP?
Browsers (for SENDERS):	Internet Explorer 6.0? or above
Browsers (for SIGNERS):	Internet Explorer 6.0?, Mozilla FireFox 1.0, NetScape 7.2 (or above)
Email:	Access to a valid email account
Screen Resolution:	800 x 600 minimum
Enabled Security Settings:	•Allow per session cookies •Users accessing the internet behind a Proxy Server must enable HTTP 1.1 settings via proxy connection

** These minimum requirements are subject to change. If these requirements change, we will provide you with an email message at the email address we have on file for you at that time providing you with the revised hardware and software requirements, at which time you will have the right to withdraw your consent.

Acknowledging your access and consent to receive materials electronically
To confirm to us that you can access this information electronically, which will be similar to other electronic notices and disclosures that we will provide to you, please verify that you were able to read this electronic disclosure and that you also were able to print on paper or electronically save this page for your future reference and access or that you were able to e-mail this disclosure and consent to an address where you will be able to print on paper or save it for your future reference and access. Further, if you consent to receiving notices and disclosures exclusively in electronic format on the terms and conditions described above, please let us know by clicking the 'I agree' button below.
By checking the 'I Agree' box, I confirm that:

- I can access and read this Electronic CONSENT TO ELECTRONIC RECEIPT OF ELECTRONIC RECORD AND SIGNATURE DISCLOSURES document; and

- I can print on paper the disclosure or save or send the disclosure to a place where I can print it, for future reference and access; and

- Until or unless I notify City of Denton as described above, I consent to receive from exclusively through electronic means all notices, disclosures, authorizations, acknowledgements, and other documents that are required to be provided or made available to me by City of Denton during the course of my relationship with you.

Procurement
901 B Texas St., Denton, TX 76209 • (940) 349-7100

MEMORANDUM

DATE: December 15, 2025

TO: Membership of the Public Utilities Board

FROM: Christine Taylor, Assistant City Manager

SUBJECT: Retroactive Council Items

The following items were approved by the City Council on November 18, 2025. However, due to the lack of a quorum, the Public Utilities Board did not convene on November 17, 2025, and therefore did not provide a recommendation to the City Council regarding these items.

PUB25-204	25-1998	8525-011	Cell 6 Construction Quality Assurance Service
PUB25-205	25-2000	8825	DEC Gas Admission Valves
PUB25-206	25-2003	8826	DEC Cylinder Head Replacement and Overhaul Services
PUB25-207	25-2008	8885	Steel Containers for Commercial Customers
PUB25-210	25-2026	8818	Pumps, Blowers, Motor Repairs & Services
PUB25-211	25-2028	8818	Pump, Blower, Motor Repairs & Services
PUB25-212	25-2030	8841	Ray Roberts Ozone Gen PLC Upgrades
PUB25-213	25-2044	7574-029	RRWTP Expansion Amendment 1
PUB25-214	25-2046	7718	OSI Amendment
PUB25-215	25-2063	7738	Uniform and Accessories Rental Amendment
PUB25-216	25-2068	8850	Compliance Tracking Software

Please find attached the Summary Agenda from the City Council meeting held on November 18, 2025. All documents submitted to the Council are accessible through the embedded links within the Summary Agenda.

Prepared By:
Lori Hewell, Purchasing Manager

Submitted By:
Christine Taylor, Assistant City Manager

City of Denton

Meeting Agenda

City Council

City Hall
215 E. McKinney St.
Denton, Texas 76201
www.cityofdenton.com

Tuesday, November 18, 2025 | **3:00 PM** | **Council Work Session Room & Council Chambers**

SPECIAL CALLED

WORK SESSION BEGINS AT 3:00 P.M. IN THE COUNCIL WORK SESSION ROOM

CLOSED MEETING BEGINS IMMEDIATELY FOLLOWING THE WORK SESSION IN THE COUNCIL WORK SESSION ROOM

CITY COUNCIL CONSIDERATION OF THE CONSENT AGENDA AND ITEMS FOR INDIVIDUAL CONSIDERATION WILL BEGIN IMMEDIATELY FOLLOWING THE CLOSED MEETING IN THE COUNCIL CHAMBERS.

CONSIDERATION OF THE PUBLIC HEARING(S) WILL BEGIN AT/AFTER 6:30 P.M. IN THE COUNCIL CHAMBERS.

REGISTRATION GUIDELINES FOR ADDRESSING THE CITY COUNCIL

Individuals may speak during a Council meeting under one of the following categories:

Comments on Agenda Items:

Public comments can be given for any item considered by the Council, EXCEPT work session reports or closed meetings. Individuals are only able to comment one time per agenda item and cannot use more than one method to comment on a single agenda item. Public comments are limited to three (3) minutes per citizen.

Public Hearing Items:

Individuals are limited to four (4) minutes per public hearing item.

Individuals may participate by using one of the following methods:

1. **In Person for Regular or Consent Agenda Items:**

   To provide in-person comments on consent agenda items, individuals must be present at the Work Session portion of the meeting. To provide in-person comments on individual consideration items, individuals must be present at the Regular or Special Session portion of the meeting. In both instances, individuals must also submit a speaker card (available at the meeting location) to the City Secretary prior to the item being called.

2. **In Person for Public Hearing Items:**

For public hearing items, speaker cards are encouraged but not required.

3. eComment:

The agenda is posted online at www.cityofdenton.com/publicmeetings. Once the agenda is posted, a link to make virtual comments using the eComment module will be made available next to the meeting listing on the Upcoming Events Calendar. Using eComment, Individuals may indicate support or opposition and submit a brief comment about a specific agenda item. eComments may be submitted up until the start of the meeting at which time the ability to make an eComment will be closed. eComments will be sent directly to members of the City Council immediately upon submission and recorded by the City Secretary into the Minutes of the Meeting.

After determining that a quorum is present, the City Council of the City of Denton, Texas will convene in a Work Session on Tuesday, November 18, 2025, at 3:00 p.m. in the Council Work Session Room at City Hall, 215 E. McKinney Street, Denton, Texas at which the following items will be considered:

WORK SESSION

1. Citizen Comments on Consent Agenda Items

This section of the agenda allows citizens to speak on any item listed on the Consent Agenda prior to its consideration. Each speaker will be given a total of three (3) minutes to address any item(s). Any person who wishes to address the City Council regarding these items may do so by submitting a completed speaker card (available at the meeting location) to the City Secretary at the commencement of the Work Session meeting. Registration is required prior to the time the City Council considers this item.

2. Requests for clarification of agenda items listed on this agenda for public hearing and individual consideration.

This section allows members of the City Council to ask questions on items listed on this agenda for public hearing and individual consideration. Responses to questions on items listed under the consent agenda that are received prior to the meeting are available by clicking on Exhibit 1 below. The responses will be available prior to the start of the meeting, when applicable. Any handouts distributed at the meeting will also be uploaded to the below link by 12:00 p.m. on the business day following the meeting. Members of the Council may remove items from the consent agenda. When items are removed from the consent agenda and placed on the regular agenda by members of the council, the removed items shall be taken up in the order of removal right after the consent agenda.

A. ID 25-474 Meeting Questions, Responses & Handouts

3. Work Session Reports

A. ID 25-1392 Receive a report and give staff direction regarding updates to the Housing Tax Credit Request for Support Policy.
[Estimated Presentation/Discussion Time: 60 minutes]

Following the completion of the Work Session, the City Council will convene in a Closed Meeting in the Council Work Session Room to consider specific item(s) when these items are listed below under the Closed Meeting section of this agenda. The City Council reserves the right to adjourn into a Closed Meeting on any item on its Open Meeting agenda consistent with Chapter 551 of the Texas Government Code, as amended, or as otherwise allowed by law.

1. Closed Meeting:

A. ID 25-915 Deliberations regarding Economic Development - Under Texas Government Code Section 551.087.

Receive a report and hold a discussion regarding the potential offer of a financial or other incentive to a business prospect code-named Project Striped Shirt which the City seeks to have locate, stay, renovate, or expand in or near the territory of the City and with which the City is conducting economic development negotiations. This discussion shall include commercial and financial information, including an economic development incentive request the City has received from Project Striped Shirt.

B. **ID 25-1901** Deliberations regarding Economic Development - Under Texas Government Code Section 551.087.

Receive a report and hold a discussion regarding the potential offer of a financial or other incentive to a business prospect code-named Project Loom which the City seeks to have locate, stay, renovate, or expand in or near the territory of the City and with which the City is conducting economic development negotiations. This discussion shall include commercial and financial information, including an economic development incentive request the City has received from Project Loom.

C. **ID 25-2130** Consultation with Attorneys - Under Texas Government Code Section 551.071.

Consult with the City's attorneys on the legal status, strategy and options for resolution of litigation styled "2020 Long Tail Trail Investments, LLC v. the City of Denton, Texas, et al." (Cause No. 24-0075-431) pending in the 431st District Court, Denton County, Texas and "City of Grand Prairie, et al. v. The State of Texas, et al." (Cause No. D-1-GN-23-007785) pending in the 261st District Court, Travis County, Texas; where public discussion of these legal matters would conflict with the duty of the City's attorneys to the City of Denton and the Denton City Council under the Texas Disciplinary Rules of Professional Conduct of the State Bar of Texas, or otherwise compromise the City's legal position in pending litigation.

Any final action, decision, or vote on a matter deliberated in a Closed Meeting will only be taken in an Open Meeting that is held in compliance with Texas Government Code, Chapter 551, except to the extent such final decision, or vote is taken in the Closed Meeting in accordance with the provisions of Section 551.086 of the Texas Government Code (the 'Public Power Exception'). The City Council reserves the right to adjourn into a Closed Meeting or Executive Session as authorized by Texas Government Code, Section 551.001, et seq. (The Texas Open Meetings Act) on any item on its open meeting agenda or to reconvene in a continuation of the Closed Meeting on the Closed Meeting items noted above, in accordance with the Texas Open Meetings Act, including, without limitation Sections 551.071-551.086 of the Texas Open Meetings Act.

NOTE: Any item for which a formal action at the Regular Meeting has been taken by Council may be subject to a request for a motion for reconsideration at any time during the meeting, at the Concluding Items Section, or after the meeting. In order to comply with the Texas Open Meetings Act, a request for a motion for reconsideration made during, at the end of, or after a Council meeting will be placed on the agenda and considered at the next official meeting of the City Council.

Following the Closed Meeting, the City Council will reconvene in Open Meeting to take action, if any, on matters discussed in closed session.

AFTER DETERMINING THAT A QUORUM IS PRESENT, THE SPECIAL CALLED MEETING OF THE CITY OF DENTON CITY COUNCIL WILL CONVENE IN THE COUNCIL CHAMBERS AT CITY HALL, 215 E. MCKINNEY STREET, DENTON, TEXAS FOR CONSIDERATION OF THE CONSENT AGENDA AND ITEMS FOR INDIVIDUAL CONSIDERATION IMMEDIATELY FOLLOWING THE CLOSED MEETING.
CONSIDERATION OF THE PUBLIC HEARING(S) WILL CONVENE AT 6:30 P.M.

1. PROCLAMATIONS/PRESENTATIONS

A. **ID 25-2054** Proclamation: The Season to Give with Joy to the Salvation Army

2. CONSENT AGENDA

Each of these items is recommended by Staff or a board, commission, and committee. Approval thereof will be strictly on the basis of those recommendations. Approval of the Consent Agenda authorizes the City Manager or his designee to implement each item in accordance with the Staff recommendations. The City Council has received background information and has had an opportunity to raise questions regarding these items prior to consideration.

For those items recommended by a specific board, commission, or committee, the agenda item will reference that recommendation. To view the video of the related board, commission, or committee meeting, as applicable, a link can be found within the applicable supporting documentation (Exhibit 1).

Listed below are bids, purchase orders, contracts, and other items to be approved under the Consent Agenda (Agenda Items A –AL). This listing is provided on the Consent Agenda to allow Council Members to discuss or withdraw an item prior to approval of the Consent Agenda. If no items are pulled, the Consent Agenda Items will be approved with one motion. If items are pulled for separate discussion, they may be considered as the first items following approval of the Consent Agenda.

A. ID 25-069 Consider approval of the minutes of the October 14, 2025 Special Called Meeting.

B. ID 25-1982 Consider approval of a resolution of the City of Denton establishing the 2026 City Council meeting schedule; and providing an effective date.

C. ID 25-2138 Consider approval of a resolution of the City of Denton confirming the appointment of Ingrid Rex as the City Secretary; and providing an effective date.

D. **ID 25-1803** Consider adoption of an ordinance by the City of Denton authorizing the City Manager, or designee, to execute (I) a Gas Line Rearrangement and Abandonment

Agreement with EagleRidge Energy II LLC, EagleRidge Operating LLC, USG Properties Barnett II, LP, and Marubeni Shale Investment, LLC, ("EagleRidge"), for the relocation of a 3-inch gas pipeline (Cardwell Sater Relocation), ("EagleRidge Facilities"), for the City's Hickory Creek Road Phase 3 Widening and Realignment Project and (II) a Right of Way License with EagleRidge; providing for the expenditure of funds in the not-to-exceed amount of Two Hundred Sixty Thousand, Eight Hundred Twenty-Four Dollars and 69/100 ($260,824.69); and providing an effective date.

E. ID 25-1828 Consider adoption of an ordinance approving a Water and Wastewater Utility Relocation Standard Utility Agreement ("Agreement") by and between the City of Denton ("City") and the Texas Department of Transportation ("TxDOT"), for (I) the reimbursement of eligible costs incurred in the adjustment, removal, and relocation of City Facilities of both Water and Wastewater Utilities along FM 1515 from Bonnie Brae St to Masch Branch Road more specifically called TxDOT Projects construction CSJ# 0191-01-011 and ROW CSJ#0191-01-012 ("Utility Relocations Project"), within the County and City of Denton, Texas; authorizing the City Manager to execute and deliver the Standard Utility Agreement No.: U00023607 and (II) the quitclaim of a portion or all of the underlying land interests; providing for the reimbursement of funds in an amount not to exceed $23,567.77 for Water and Wastewater Utility Relocation efforts; providing for the expenditure of funds; and providing an effective date. The Public Utility Board approves (6-0).

F. ID 25-1853 Consider adoption of an ordinance of the City of Denton approving a substantial amendment to the City's 2021-2025 Action Plan for Housing and Community Development, the 2021 HOME-ARP Allocation Plan and the 2023-2027 Consolidated Plan for Housing and Community Development and the Citizen Participation Plan; authorizing the City Manager to sign and submit the substantial amendment; and providing an effective date. The Community Services Advisory Committee recommended approval (4-0).

G. ID 25-1911 Consider adoption of an ordinance of the City of Denton adopting an updated Downtown Reinvestment Grant Program Policy for the Downtown Reinvestment Grant Program; providing a repealer; and providing an effective date. The Downtown Tax Increment Reinvestment Zone 1 Board recommends approval (6 - 0)...Body

H. ID 25-1960 Consider adoption of an ordinance of the City of Denton, Texas, reappointing the Honorable Ann Poston, the Honorable Cynthia Burkett, and the Honorable Kimberly Lafferty, and the Honorable Hyattye Simmons, each as Assistant Judge for the City of Denton Municipal Court of Record for a two (2) year term beginning December 31, 2025, and ending December 30, 2027; appointing Alissa Janke, as Assistant Judge for the City of Denton Municipal Court of Record for a two (2) year term beginning December 31, 2025, and ending December 30, 2027; authorizing expenditure of funds; authorizing the Mayor to execute a contract for the designated term of office for each judge; and declaring an effective date.

I. ID 25-2036 Consider adoption of an ordinance of the City of Denton authorizing the submission of an application to the State of Texas, Office of the Governor, 2026

Bullet-Resistant Components for Law Enforcement Vehicles grant program funded through the US Department of Homeland Security in the amount of $378,000 for ballistic resistant panels; and providing an effective date.

J. ID 25-2053 Consider adoption of an ordinance of the City of Denton authorizing the City Manager to execute an agreement between the City of Denton and the Greater Denton Arts Council, Inc., for the payment and use of program year 2026 hotel tax revenue in support of art exhibitions and programming; and providing an effective date. ($231,128 - Community Partnership Committee recommends approval 3-0)

K. ID 25-2131 An ordinance of the City of Denton, approving a Settlement Agreement and Mutual Release implementing the terms of the settlement in litigation styled "2020 Long Tail Trail Investments, LLC v. the City of Denton, Texas, et al." (Cause No. 24-0075-431) pending in the 431st District Court, Denton County, Texas and "City of Grand Prairie, et al. v. The State of Texas, et al." (Cause No. D-1-GN-23-007785) pending in the 261st District Court, Travis County, Texas; and directing the City Manager and the City's attorneys to effectuate as necessary and appropriate the terms of a Settlement Agreement and Release to effectuate this approval; and declaring an effective date.

L. ID 25-1930 Consider adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the approval of Change Order No. 10 to the Design-Build Agreement between the City of Denton and Beta Engineering, LLC, for the design and construction of the Hickory Gas Insulated Substation for Denton Municipal Electric; providing for the expenditure of funds therefor; and providing an effective date (RFQ 7670 - Change Order No. 10 in the not-to-exceed amount of $1,008,314.26, for a total contract award aggregated to $44,446,058.31). The Public Utilities Board recommends approval (5 - 0).

M. ID 25-1934 Consider adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute a contract with LHD PARTNERS, L.P. dba Longhorn Harley-Davidson, through the Buy Board Cooperative Purchasing Network Contract No. 724-23, for the acquisition, repairs, and maintenance of Harley-Davidson Police Packaged Motorcycles for the Fleet Services Department; providing for the expenditure of funds therefor; and providing an effective date (File 8930 - awarded to LHD PARTNERS, L.P. dba Longhorn Harley-Davidson, for one (1) year, with the option for four (4) additional one (1) year extensions, in the total five (5) year not-to-exceed amount of $635,250.00).

N. ID 25-1946 Consider adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute a contract with PiggyBack Cabling LLC dba PBC Technologies, for a Security Operations Center (SOC) and Managed Security Service (MSS) for the Technology Services Department; providing for the expenditure of funds therefor; and providing an effective date (RFP 8853 - awarded to PiggyBack Cabling LLC dba PBC Technologies, in the five (5) year not-to-exceed amount of $1,000,000.00).

O. ID 25-1947 Consider adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute an Agricultural Lease Agreement with Rafter B Farms, LLC, for the cutting, baling, and prompt

removal of hay from leased agricultural portions of the Denton Enterprise Airport; providing for the expenditure of funds therefor; and providing an effective date (RFP 8890 - awarded to Rafter B Farms, LLC, for one (1) year, with the option for four (4) additional one (1) year extensions, in the total five (5) year term).

P. ID 25-1996 Consider adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute a contract with Team Marathon Fitness, Inc. dba Marathon Fitness through the Buy Board Cooperative Purchasing Network Contract No. 764-25, for the purchase of commercial grade fitness equipment for the Parks and Recreation, Fire, and Police Departments; providing for the expenditure of funds therefor; and providing an effective date awarded to (File 8920 - awarded to Team Marathon Fitness, Inc. dba Marathon Fitness, in the not-to-exceed amount of $200,000.00).

Q. ID 25-1998 Consider adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute a Professional Services Agreement with Biggs & Mathews Environmental, Inc., for Cell 6 Construction Quality Assurance Services for the Solid Waste and Recycling Department as set forth in the contract; providing for the expenditure of funds therefor; and providing an effective date (RFQ 8525-011 - Professional Services Agreement for assurance services awarded to Biggs & Mathews Environmental, Inc., in the not-to-exceed amount of $245,000.00). The Public Utilities Board will consider this item on Monday, November 17, 2025.

R. ID 25-2000 Consider adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute a contract with Wärtsilä North America Inc., for cylinder gas admission valves for the Denton Energy Center, which is the sole provider of this equipment, in accordance with Texas Local Government Code 252.022, which provides that procurement of commodities and services that are available from one source are exempt from competitive bidding, and if over $50,000, shall be awarded by the governing body; providing for the expenditure of funds therefor; and providing an effective date (File 8825 - awarded to Wärtsilä North America Inc., for one (1) year, with the option for four (4) additional one (1) year extensions, in the total five (5) year not-to-exceed amount of $1,415,582.00). The Public Utilities Board will consider this item on Monday, November 17, 2025.

S. ID 25-2005 Consider adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute a contract with Salary.com, LLC, for a compensation platform subscription service to support Human Resources in maintaining a competitive, sustainable, and agile compensation program; providing for the expenditure of funds therefor; and providing an effective date (RFP 8702 - awarded to Salary.com, LLC, for three (3) years, with the option for two (2) additional one (1) year extensions, in the total five (5) year not-to-exceed amount of $204,970.00).

T. ID 25-2008 Consider adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute a contract with Roll-Offs of America, Inc. dba Roll Offs USA, for the purchase of steel refuse and

recycling containers for the Solid Waste Department; providing for the expenditure of funds therefor; and providing an effective date (RFP 8885 - awarded to Roll-Offs of America, Inc. dba Roll Offs USA, for one (1) year, with the option for four (4) additional one (1) year extensions, in the total five (5) year not-to-exceed amount of $2,666,500.00). The Public Utilities Board will consider this item on Monday, November 17, 2025.

U. ID 25-2013 Consider adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute an Interlocal Cooperative Purchasing Agreement with the City of Haslet under the Texas Government Code, Section 791.001, to authorize the City of Haslet and the City of Denton to utilize each entities' solicited contracts for the purchasing of various goods and services; authorizing the expenditure of funds therefor; and declaring an effective date (File 8875 - award an Interlocal Cooperative Purchasing Agreement with the City of Haslet).

V. ID 25-2023 Consider adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute a contract with 4Imprint, Inc., through Choice Partners, a division of Harris County Department of Education (HCDE) Purchasing Network Contract No. 24/043SG-01, for procurement fulfillment of Awards, Apparel, Screen Printing & Embroidery, Promotional and Commemorative Items related to products for the City of Denton; providing for the expenditure of funds therefor; and providing an effective date (File 8946 - awarded to 4Imprint, Inc., fin the three (3) year not-to-exceed amount of $400,000.00).

W. ID 25-2024 Consider adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute a contract with Innovative Interfaces Incorporated, for vendor support of the Sierra Integrated Library System (ILS) software and associated software modules along with new software upgrades for the Library Department, which is the sole provider of this software, in accordance with Texas Local Government Code 252.022, which provides that procurement of commodities and services that are available from one source are exempt from competitive bidding, and if over $50,000, shall be awarded by the governing body; providing for the expenditure of funds therefor; and providing an effective date (File 8888 - awarded to Innovative Interfaces Incorporated, for three (3) years, with the option for two (2) additional one (1) year extensions, in the total five (5) year not-to-exceed amount of $477,208.11).

X. ID 25-2026 Consider adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute a contract with Brandon & Clark, Inc., for motor and blower parts, repair, services, and rebuild of motors and blowers at the Denton Energy Center, Water Production and Reclamation facilities; providing for the expenditure of funds therefor; and providing an effective date (RFP 8818 - awarded to Brandon & Clark, Inc., for one (1) year, with the option for four (4) additional one (1) year extensions, in the total five (5) year not-to-exceed amount of $1,457,500.00). The Public Utilities Board will consider this item on Monday, November 17, 2025.

Y. ID 25-2028 Consider adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute a contract with Smith Pump Company, Inc., for pump parts, repair, services and rebuild of pumps for the Water Production facilities; providing for the expenditure of funds therefor; and providing an effective date (RFP 8818 - awarded to Smith Pump Company, Inc., for one (1) year, with the option for four (4) additional one (1) year extensions, in the total five (5) year not-to-exceed amount of $600,000.00). The Public Utilities Board will consider this item on Monday, November 17, 2025.

Z. ID 25-2030 Consider adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute a contract with Xylem Water Solutions U.S.A., Inc., for the Ray Roberts Water Treatment Plant - Ozone Generator Programmable Logic Controller Upgrades for Water Production, which is the sole provider of this equipment, in accordance with Texas Local Government Code 252.022, which provides that procurement of commodities and services that are available from one source are exempt from competitive bidding, and if over $50,000, shall be awarded by the governing body; providing for the expenditure of funds therefor; and providing an effective date (File 8841 - awarded to Xylem Water Solutions U.S.A., Inc., in the not-to-exceed amount of $900,000.00). The Public Utilities Board will consider this item on Monday, November 17, 2025.

AA. ID 25-2038 Consider adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute an Interlocal Cooperative Purchasing Agreement with Alliance for Innovation, Inc., and a Service Agreement with Alliance for Innovation, Inc. and Civic Marketplace, Inc, under the Texas Government Code, Section 791.001, to authorize sharing City of Denton cooperative contracts for the purchase of various goods and services; and declaring an effective date (File 8948 - award an Interlocal Cooperative Purchasing Agreement with Alliance for Innovation, Inc. and a Service Agreement with Alliance for Innovation, Inc. and Civil Marketplace, Inc).

AB. ID 25-2039 Consider adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to utilize a contract through the North Central Texas Council of Governments (NCTCOG) Purchasing Network, Contract No. 2022-035, for roadway workzone data reporting software for the Transportation Services Department; providing the expenditure of funds therefor; and providing an effective date (File 8918 - awarded to Navjoy Consulting Services, Inc., in the three (3) year not-to-exceed amount of $299,800.00).

AC. ID 25-2044 Consider adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the approval of a first amendment to a Professional Services Agreement between the City of Denton and Freese and Nichols, Inc., amending the contract approved by City Council on October 22, 2024, in the not-to-exceed amount of $21,000,000.00; said first amendment to extend the required pilot study for the Ray Roberts Water Treatment Plant Expansion Project for the Water Utilities Department; providing for the expenditure of funds therefor; and providing an effective date (RFQ 7574-029 - providing for an additional first amendment expenditure amount not-to-exceed $184,000.00, with the total contract

amount not-to-exceed $21,184,000.00). The Public Utilities Board will consider this item on Monday, November 17, 2025.

AD. ID 25-2046 Consider adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the approval of a first amendment to a contract between the City of Denton and Open Systems International, Inc., amending the contract approved by City Council on September 21, 2021, in the not to exceed amount of $1,500,000.00, said amendment to provide the renewal of maintenance, support, and upgrade services of OSI Monarch for Denton Municipal Electric; providing for the expenditure of funds therefor; and providing an effective date (File 7718 - providing for an additional first amendment expenditure amount not-to-exceed $193,973.00, with the total contract amount not-to-exceed $1,693,973.00). The Public Utilities Board will consider this item on Monday, November 17, 2025.

AE. ID 25-2063 Consider adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the approval of a first amendment to a contract between the City of Denton and Cintas Corporation No. 2, amending the contract approved by City Council on September 14, 2021, in the not-to-exceed amount of $2,153,000.00; said first amendment to continue to provide uniforms and accessories rentals for all City of Denton Departments; providing for the expenditure of funds therefor; and providing an effective date (File 7738 - providing for an additional first amendment expenditure amount not-to-exceed $538,250.00, with the total contract amount not-to-exceed $2,691,250.00). The Public Utilities Board will consider this item on Monday, November 17, 2025.

AF. ID 25-2068 Consider adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute a contract with SwiftComply US OpCo Inc., for compliance tracking software for the Environmental Services and Sustainability, Denton Water Utilities, and Street Operations Departments; providing for the expenditure of funds therefor; and providing an effective date (RFP 8850 - awarded to SwiftComply US OpCo Inc., in the five (5) year not-to-exceed amount of $92,028.00). The Public Utilities Board will consider this item on Monday, November 17, 2025.

AG. ID 25-2003 Consider adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute a contract with Wärtsilä North America Inc., for the cylinder head valve replacement overhaul for the Denton Energy Center, which is the sole provider of this equipment, in accordance with Texas Local Government Code 252.022, which provides that procurement of commodities and services that are available from one source are exempt from competitive bidding, and if over $50,000, shall be awarded by the governing body; providing for the expenditure of funds therefor; and providing an effective date (File 8826 - awarded to Wärtsilä North America Inc., for one (1) year, with the option for four (4) additional one (1) year extensions, in the total five (5) year not-to-exceed amount of $5,852,615.00). The Public Utilities Board will consider this item on Monday, November 17, 2025.

AH. ID 25-1784 Consider adoption of an ordinance of the City of Denton authorizing the City

Manager to execute an Interlocal Cooperation Agreement between the City of Denton and the North Central Texas Council of Governments (NCTCOG) regarding pedestrian-bicyclist permanent counters not to exceed $14,000 through fiscal year 2029; and providing for an effective date.

AI. ID 25-1929 Consider adoption of an ordinance of the City of Denton granting the Denton Holiday Lighting Festival Association, Inc., a three-year noise exception for the Denton Holiday Lighting on Saturday, December 6, 2025, 3 p.m. to 9 p.m., Saturday December 5, 2026, 3 p.m. to 9 p.m., and Saturday December 4, 2027, 3 p.m. to 9 p.m., at Quakertown Park; and providing an effective date.

AJ. ID 25-2040 Consider adoption of an ordinance of the City of Denton authorizing the City Manager to execute an interlocal cooperation agreement between the City of Denton and Denton Independent School District (DISD) regarding the exchange of approximately 9.4 acres of park land in South Lakes Park for approximately 3.433 of DISD land to accommodate the development of a city neighborhood park and DISD track improvements; and providing for an effective date.

AK. ID 25-1670 Consider approval of a resolution of the City of Denton approving the City's participation in the AAMTEX, LLC, North Texas Shared Airspace Implementation, an evaluation, technology development, and rulemaking process for improving the coordination and intervisibility of commercial and public safety uncrewed aerial systems (UAS) "drones" in the National Airspace System (NAS); and providing an effective date.

AL. ID 25-1767 Consider adoption of an ordinance by the City of Denton, A Texas Home-Rule Municipal Corporation, authorizing the City Manager to execute the Work Zone Data Exchange Agreement with North Central Texas Council of Governments to streamline the work zone information system for the City of Denton; and providing an effective date.

3. ITEM FOR INDIVIDUAL CONSIDERATION

A. A25-0002 Consider adoption of an ordinance of the City of Denton, Texas, regarding a Municipal Services Agreement, pursuant to Tex. Loc. Govt Code Sec. 43.0672, between the City of Denton and Denton Double Down, LLC for the provision of city services to approximately 4.47 acres of land, generally located on the south side of Hartlee Field Road, approximately 580 feet east of East Sherman Drive; approving a schedule of annexation; authorizing the City Manager to execute the agreement; and providing an effective date. (A25-0002, Denton Striker, Ashley Ekstedt)

4. PUBLIC HEARINGS

A. A25-0002a Hold a public hearing and consider a petition for voluntary annexation of approximately 4.47 acres of land, generally located on the south side of Hartlee Field Road, approximately 580 feet east of East Sherman Drive, into the City of Denton, Denton County, Texas. (A25-0002a, Denton Striker, Ashley Ekstedt)

B. Z25-0013a Hold a public hearing and consider adoption of an ordinance of the City of Denton, Texas, regarding a change in the zoning district and use classification from Rural

Residential (RR) District and Residential 4 (R4) District to the Residential 7 (R7) District on approximately 6.63 acres of land generally located south of East McKinney Street, approximately 615 feet west of Glenngary Way, in the City of Denton, Denton County, Texas; adopting an amendment to the City's official zoning map; providing for a penalty in the maximum amount of $2,000.00 for violation thereof; providing a severability clause and an effective date. The Planning and Zoning Commission voted (6-0) to recommend approval of the request. Motion for approval by Commissioner Riggs and second by Commissioner Dyer. (Z25-0013a, 5090-5094 E McKinney, Mia Hines)

C. PD25-0004a Hold a public hearing and consider adoption of an ordinance of the City of Denton, Texas, regarding a change in the zoning district and use classification from Residential 1 (R1) to a Overlay Planned Development with a base zoning of Suburban Corridor (PD-SC) District on approximately 2.633 acres of land generally located northeast of the intersection of US 377 and Brush Creek Road, in the City of Denton, Denton County, Texas; adopting an amendment to the City's official zoning map; providing for a penalty in the maximum amount of $2,000.00 for violations thereof; providing a severability clause and an effective date. The Planning and Zoning Commission voted (7-0) to recommend approval of the request. Motion for approval by Commissioner Garland and seconded by Commissioner Ketchersid. (PD25-0004a, Brush Creek Center, Angie Manglaris)

D. PDA25-0002a Hold a public hearing and consider adoption of an ordinance of the City of Denton, Texas, regarding an amendment to Planned Development District 139 (PD-139), with amendments including but not limited to the development plan to remove a planned high school and adjust design elements of the remaining elements of the project, on approximately 15.375 acres of land generally located south of Vintage Boulevard, approximately 540 feet east of the I-35W Vintage Boulevard Ramp in the City of Denton, Denton County, Texas; adopting an amendment to the City's official zoning map; providing for a penalty in the maximum amount of $2,000.00 for violations thereof; providing a severability clause and an effective date. The Planning and Zoning Commission voted (7-0) to recommend approval of the request. Motion for approval by Commissioner Riggs and second by Commissioner McDuff. (PDA25-0002a, Charter School, Julie Wyatt).

5. ITEMS FOR INDIVIDUAL CONSIDERATION – CONSIDERATION OF THE USE OF EMINENT DOMAIN TO CONDEMN REAL PROPERTY INTERESTS

A. ID 25-1145 Consider adoption of an ordinance of the City of Denton determining the public use, need, and necessity for the acquisition of rights-of-way parcels, permanent drainage, and temporary construction easements generally located along Ryan Road between Country Club Road and Teasley Lane, situated in the T. Lobar Survey, Abstract No. 779, the A. Gibson Survey, Abstract No. 498, the T. Martin Survey, Abstract No. 900, the C. Pollalier Survey, Abstract No. 1006, the James W. Withers Survey, Abstract No. 1343, the Eli Picket Survey, Abstract No. 1018, and the T. Peacock Survey, Abstract No. 1589, all in the City and County of Denton, Texas, and more particularly described in the attached Exhibit "A" (collectively, the "Property Interests"); authorizing the City Manager and the City Attorney to acquire the Property Interests by agreement if possible, including making all offers required by

law; authorizing the use of the power of eminent domain to condemn the Property Interests if agreement cannot be reached; authorizing the City Attorney to file eminent domain proceedings if necessary; authorizing the expenditure of funding; making findings; providing a savings clause; and providing an effective date.

B. ID 25-1149 Consider adoption of an ordinance of the City of Denton determining the public use, need, and necessity for acquisition of a (i) temporary construction easement and a (ii) right-of-way parcel, generally located along East McKinney Street just east of North Woodrow/Audra Lane, situated in the T. Downing Survey, Abstract No. 346 all in the City and County of Denton, Texas, and more particularly described in the attached Exhibit(s) "A" (collectively, the "Property Interest(s)"); authorizing the City Manager and City Attorney to acquire the Property Interests by agreement if possible, including making all offers required by law; authorizing the use of the power of eminent domain proceedings if necessary; authorizing the expenditure of funding; making findings; providing a savings clause; and providing an effective date.

6. ITEMS FOR INDIVIDUAL CONSIDERATION (continued)

A. A25-0002b Conduct the first of two readings of an ordinance of the City of Denton, Texas annexing approximately 4.47 acres of land, generally located on the south side of Hartlee Field Road, approximately 580 feet east of East Sherman Drive, into the City of Denton, Denton County, Texas; providing for a correction to the City map to include the annexed land; and providing for a savings clause and an effective date. (A25-0002b, Denton Striker, Ashley Ekstedt)

B. A25-0001c Conduct the second of two readings of an ordinance of the City of Denton, Texas, annexing approximately 15.011 acres of land, generally located north of West University Drive (US 380) and approximately half a mile west of Golden Hoof Drive to the City of Denton, Denton County, Texas; providing for a correction to the City map to include the annexed land; and providing for a savings clause and an effective date. (A25-0001c, Hickory Grove MF 2, Mia Hines)

C. HL25-0003a Consider approval of a resolution of the City of Denton approving an application for a partial tax exemption of designated historic sites, in accordance with Chapter 10, Article VI, Sections 10-126 through 10-129 of the Denton Municipal Code of Ordinances, for a Local Historic Landmark located at 218 N Locust Street, located on the southeast corner of the intersection of N Locust Street and E McKinney Street; providing for severability; and providing an effective date. The Historic Landmark Commission recommends a favorable determination (5-0). (HL25-0003a, 218 N Locust Street - Tax Exemption, Cameron Robertson)

D. ID 25-1955 Consider adoption of an ordinance of the City of Denton, Texas, establishing the Capital Improvement Advisory Committee of the City; establishing the powers and duties of the Capital Improvement Advisory Committee; repealing prior CIAC enabling Ordinances 2015-109, 2018-411, and those Ordinances in direct conflict herewith; providing severability and repealer clauses; and providing an effective date.

E. ID 25-2061 Consider adoption of an ordinance of the City of Denton, Texas authorizing the

expenditure of funds for the payment of wholesale transmission charges in the total amount of $10,803,259.00; and providing an effective date. The Public Utilities Board will consider this item on Monday, November 17, 2025.

F. ID 25-1933 Consider adoption of an ordinance of the City of Denton, a Texas home-rule municipal corporation, authorizing the City Manager to execute a contract with Exceleron Software, LLC., for a prepaid utilities solution for the Customer Service Department, which is the sole provider of this software, in accordance with Texas Local Government Code 252.022, which provides that procurement of commodities and services that are available from one source are exempt from competitive bidding, and if over $50,000, shall be awarded by the governing body; providing for the expenditure of funds therefor; and providing an effective date (File 8923 - awarded to Exceleron Software, LLC., through September 30, 2038, in the not-to-exceed amount of $15,460,605.23). The Public Utilities Board recommends approval (5 - 0).

G. ID 25-1979 Consider approval of a resolution of the City of Denton renaming the Civic Center (321 E. McKinney St.) to the Quakertown Civic Center; and providing an effective date. The Parks, Recreation and Beautification Board voted to recommend adoption (5-0).

H. ID 25-1980 Consider approval of a resolution of the City of Denton naming the Day Labor Site (301 Fort Worth Dr.) to the Popo González Day Labor Site; and providing an effective date. The Parks, Recreation and Beautification Board voted to recommend adoption (5-0).

I. ID 25-1981 Consider approval of a resolution of the City of Denton renaming the Juneteenth Softball Tournament to the John Royston Juneteenth Softball Tournament; and providing an effective date. The Parks, Recreation and Beautification Board voted to deny the proposed naming application (5-0).

J. ID 25-1923 Consider approval of a resolution of the City of Denton authorizing the submission of an application through the Water Utilities Department to the Texas Water Development Board (TWDB) for financial assistance via a low-interest loan for sixty million dollars ($60,000,000) from the Clean Water State Revolving Fund for the Pecan Creek Water Reclamation Plant Reconstruction Project; designating the City Manager as the authorized representative of the City to apply for and take those actions necessary in connection with such application, designating the City's Financial Advisor, Engineer and Bond Counsel and authorizing them to aid, assist and appear on behalf of the City before TWDB; approving the TWDB Resolution for such application; and providing an effective date.

7. CONCLUDING ITEMS

A. Under Section 551.042 of the Texas Open Meetings Act, respond to inquiries from the City Council or the public with specific factual information or recitation of policy, or accept a proposal to place the matter on the agenda for an upcoming meeting AND Under Section 551.0415 of the Texas Open Meetings Act, provide reports about items of community interest regarding which no action will be taken, to include: expressions of thanks, congratulations, or condolence; information regarding holiday schedules; an honorary or salutary recognition of a public official, public employee, or other citizen; a reminder about an upcoming event organized or sponsored by the governing body; information regarding a social, ceremonial, or community event organized or sponsored by an entity other than the governing body that was attended or is scheduled to be attended by a member of the governing body or an official or employee of the municipality; or an announcement involving an imminent threat to the public health and safety of people in the municipality that has arisen after the posting of the agenda.

B. Possible Continuation of Closed Meeting topics, above posted.

C E R T I F I C A T E

I certify that the above notice of meeting was posted on the official website (https://tx-denton.civicplus.com/242/Public-Meetings-Agendas) and bulletin board at City Hall, 215 E. McKinney Street, Denton, Texas, on November 12, 2025, in advance of the three (3) business day posting deadline, as applicable, and in accordance with Chapter 551 of the Texas Government Code.

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OFFICE OF THE CITY SECRETARY

NOTE: THE CITY OF DENTON'S DESIGNATED PUBLIC MEETING FACILITIES ARE ACCESSIBLE IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT. THE CITY WILL PROVIDE ACCOMMODATION, SUCH AS SIGN LANGUAGE INTERPRETERS FOR THE HEARING IMPAIRED, IF REQUESTED AT LEAST TWO (2) BUSINESS DAYS IN ADVANCE OF THE SCHEDULED MEETING. PLEASE CALL THE CITY SECRETARY'S OFFICE AT 940-349-8309 OR USE TELECOMMUNICATIONS DEVICES FOR THE DEAF (TDD) BY CALLING 1-800-RELAY-TX SO THAT REASONABLE ACCOMMODATION CAN BE ARRANGED.

Finance Department
215 E. McKinney St., Denton, TX 76201 • (940) 349-8206

MEMORANDUM

DATE: December 15, 2025

TO: Public Utilities Board

FROM: Randee Klingele, Treasury Manager

SUBJECT: Utility System Extendable Commercial Paper Program

Following the cancellation of the Public Utilities Board (PUB) meeting originally scheduled for November 17, 2025, agenda item PUB25-203 was advanced directly to the City Council on December 2, 2025, Ord 25-1987.

The Utilities established an Extendable Commercial Paper program (UECP) in 2021 which requires an annual adoption of a refunding bond ordinance.

Commercial paper notes cannot have a maturity that is later than the 270th day after the date on which the paper is initially issued. This Ordinance is an integral part of the UECP program because it provides delegated authority that allows refunding bonds to be issued, within certain parameters, in the event that commercial paper is issued and cannot otherwise be retired or defeased by the 270th day. The delegated authority allows City staff to execute the sale without additional Council action. Once the exact terms of the transaction are determined, staff will provide the PUB with additional information in a management report and the City Council an informal staff report.

Outlined below are the key benefits of this refunding ordinance.

- Establishing the authority to execute the sale of long-term debt quickly, avoiding additional costs of step-up rates by not having to extend the commercial paper term.

- Rating agencies view the refunding ordinance as a positive measure that ensures the City has a quick and viable means of paying off maturing commercial paper. This measure will assist in maintaining a desirable credit rating on the commercial paper, which in turn lowers the City's borrowing costs.

- Potential investors view the refunding ordinance as a positive measure that increases confidence in the investment, which in turn creates more demand and may lower borrowing costs.

Denton Municipal Electric
1659 Spencer Rd., Denton, TX 76205 • (940) 349-8307

MEMORANDUM

DATE: December 15, 2025

TO: Membership of the Public Utilities Board

FROM: Antonio Puente, DME General Manager

SUBJECT: Retroactive Council Items

The following item was approved by the City Council on November 18, 2025. However, due to the lack of a quorum, the Public Utilities Board did not convene on November 17, 2025, and therefore did not provide a recommendation to the City Council regarding this item.

PUB25-208	ID 25-2061	FY25/26 Transmission Charges
Consider adoption of an ordinance of the City of Denton, Texas authorizing the expenditure of funds for the payment of wholesale transmission charges in the total amount of $10,803,259.00; and providing an effective date.		

Please find attached documents from the City Council meeting held on November 18, 2025.

Prepared By:
Melissa Cuevas, Division Manager of Business Services

Submitted By:
Antonio Puente, DME General Manager

City of Denton

City Hall
215 E. McKinney Street
Denton, Texas
www.cityofdenton.com

AGENDA INFORMATION SHEET

DEPARTMENT: **Denton Municipal Electric**

DCM: **Cassandra Ogden**

DATE: **November 18, 2025**

SUBJECT

Consider adoption of an ordinance of the City of Denton, Texas authorizing the expenditure of funds for the payment of wholesale transmission charges in the total amount of $10,803,259.00 and providing an effective date. The Public Utilities Board will consider this item on Monday, November 17, 2025.

BACKGROUND

The Texas Public Utility Regulatory Act requires that each Transmission Service Provider (TSP) file a tariff for transmission service with the Public Utility Commission of Texas (PUCT) in order to get such tariff approved. The tariff applies to all Distribution Service Providers (DSP). As a DSP under 16 TAC § 25.5(33), Denton Municipal Electric (DME) is obligated to compensate TSPs for their transmission cost of service based on DME's pro-rata share of the total ERCOT electric load. Other Distribution Service Providers are similarly obligated to compensate DME for their respective share of DME's transmission costs as a Transmission Service Provider.

Approval of this item will authorize the issuance of purchase orders to each of the following entities to reimburse them for DME's share of their transmission costs, as per the state law referenced in the above paragraph, less the amount that each entity owes DME for DME's transmission costs (i.e. these are net amounts). This is being brought forward to the Public Utility Board and City Council for transparency/accountability since these net payments exceed $50,000 each. In prior years, budgeted TCOS payments, have been made administratively since they are statutorily mandated payments and amounts. A number of smaller net TCOS bills (i.e. less than $50,000) are being concurrently paid under standard City payment authority.

American Electric Power	$ 1,913,727.79
City of Bryan	82,836.78
Cross Texas Transmission	427,971.57
Electric Transmission Texas, LLC.	2,088,952.71
Garland Power & Light	230,964.76
Lone Star Transmission	589,805.58
Lower Colorado River Authority	4,190,054.83
Sharyland Utilities	244,580.72
Texas Municipal Power Agency	189,032.24
Texas New Mexico Power	141,631.75
Wind Energy Transmission Texas	703,700.27
TOTAL	$10,803,259.00

It should be noted that the TCOS payment process overseen by the PUCT is iterative and that these initial billing amounts may be trued-up later by the PUCT. At that time, minor adjustments to the issued Purchase Order amounts could be necessary and will be handled administratively by the Finance Department.

These payments are mandated by the Texas Public Utility Regulatory Act and the Public Utility Commission of Texas.

RECOMMENDATION

Staff recommends approval of payment of PUCT approved transmission charges to each of the eleven transmission entities in the total amount $10,803,259.00.

FISCAL INFORMATION

Funds to meet these regulatory fee obligations were budgeted in 2025-2026 budget account 600100.6072.5650A.

EXHIBITS

1. Agenda Information Sheet
2. Ordinance
3. Presentation

Respectfully submitted:
Tony Puente
940-349-8487
DME General Manager

Prepared by:
Melissa Cuevas
940-349-7591
Division Manager of Business Services

ORDINANCE NO. _____

AN ORDINANCE OF THE CITY OF DENTON, TEXAS AUTHORIZING THE EXPENDITURE OF FUNDS FOR THE PAYMENT OF WHOLESALE TRANSMISSION CHARGES IN THE TOTAL AMOUNT OF $10,803,259.00; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, all Distribution Service Providers ("DSP") in the Electric Reliability Council of Texas ("ERCOT") is required under the Texas Public Utility Regulatory Act ("PURA") to compensate Transmission Service Providers ("TSPs") for its wholesale transmission charges, commonly referred to as Transmission Cost of Service ("TCOS"), after the same have been filed with and approved by the Public Utility Commission of Texas ("PUCT");

WHEREAS, the City of Denton (the "City"), acting under the trade name of Denton Municipal Electric, is a DSP in ERCOT;

WHEREAS, the City is required to compensate the following TSPs for its TCOS as set forth below:

Name of TSP	Amount
American Electric Power	$ 1,913,727.79
City of Bryan	$ 82,836.78
Cross Texas Transmission	$ 427,971.57
Electric Transmission Texas, LLC.	$ 2,088,952.71
Garland Power & Light	$ 230,964.76
Lone Star Transmission	$ 589,805.58
Lower Colorado River Authority	$ 4,190,054.83
Sharyland Utilities	$ 244,580.72
Texas Municipal Power Agency	$ 189,032.24
Texas New Mexico Power	$ 141,631.75
Wind Energy Transmission Texas	$ 703,700.27
TOTAL	$10,803,259.00

WHEREAS, the amounts due to the above TSPs are trued up by the PUCT and may require additional compensation by the City to one or more of the above TSPs; and

WHEREAS; the City Manager, or designee, has reviewed the above TCOS submitted by the TSPs and recommended that the City Council approve and authorize the payment of the same; NOW, THEREFORE,

THE COUNCIL OF THE CITY OF DENTON HEREBY ORDAINS:

SECTION1. The facts, circumstances, and recitations contained in the preamble of this ordinance are found and declared to be true and correct.

SECTION 2. The total expenditure of funds in the amount of $10,803,259.00 for the City's obligation as a DSP in ERCOT to following TSPs for its TCOS is authorized and payable as set forth below:

Name of TSP	Amount
American Electric Power	$ 1,913,727.79
City of Bryan	$ 82,836.78
Cross Texas Transmission	$ 427,971.57
Electric Transmission Texas, LLC.	$ 2,088,952.71
Garland Power & Light	$ 230,964.76
Lone Star Transmission	$ 589,805.58
Lower Colorado River Authority	$ 4,190,054.83
Sharyland Utilities	$ 244,580.72
Texas Municipal Power Agency	$ 189,032.24
Texas New Mexico Power	$ 141,631.75
Wind Energy Transmission Texas	$ 703,700.27
TOTAL	$10,803,259.00

SECTION 3. That as the above payments are subject to being trued up by the PUCT the additional expenditure of funds, if required, is authorized. However, this additional expenditure is specifically limited to each TSP receiving additional payments not to exceed five percent (5%) or less of the payment set forth in Section 2 above. Payments in excess of this specific limitation will require further approval by City Council.

SECTION 4. That this ordinance shall become effective immediately upon its passage and approval.

The motion to approve this ordinance was made by _____,

seconded by _____, and was passed and approved by the following vote [_____ - _____]:

	Aye	**Nay**	**Abstain**	**Absent**
Mayor Gerard Hudspeth:	_____	_____	_____	_____
Vicki Byrd, District 1:	_____	_____	_____	_____
Brian Beck, District 2:	_____	_____	_____	_____
Suzi Rumohr, District 3:	_____	_____	_____	_____
Joe Holland, District 4:	_____	_____	_____	_____
Brandon McGee, At Large Place 5:	_____	_____	_____	_____
Jill Jester, At Large Place 6:	_____	_____	_____	_____

PASSED AND APPROVED this the _____ day of _____, 2025.

_____
GERARD HUDSPETH, MAYOR

ATTEST:
LAUREN THODEN, CITY SECRETARY

BY: _____

APPROVED AS TO LEGAL FORM:
MACK REINWAND, CITY ATTORNEY

BY: Marcella Lunn

TRANSMISSION CHARGES

Fiscal Year 2025-26

Melissa Cuevas
Division Manager of Business Services
ID 25-2061

DENTON MUNICIPAL ELECTRIC

FY 2025-26 TRANSMISSION COST OF SERVICE (TCOS) CHARGES

Transmission Service Providers	Total
American Electric Power	$1,913,727.79
City of Bryan	82,836.78
Cross Texas Transmission	427,971.57
Electric Transmission Texas, LLC.	2,088,952.71
Garland Power & Light	230,964.76
Lone Star Transmission	589,805.58
Lower Colorado River Authority	4,190,054.83
Sharyland Utilities	244,580.72
Texas Municipal Power Agency	189,032.24
Texas New Mexico Power	141,631.75
Wind Energy Transmission Texas	703,700.27
TOTAL	**$10,803,259.00**

This item will authorize the expenditure of Transmission charges totaling $10,803,259. The charges will reimburse other Transmission Service providers for DME's share of their transmission assets.

TCOS FY 2025-26 PAYMENT DETAIL

$0-50,000

Transmission Service Providers	TOTAL
Cherokee County Electric Cooperative Association	$1,255.41
Deep East Texas Electric Cooperative	908.12
East Texas Electric Cooperative	1,532.33
Fannin Electric Coop	951.52
Farmers Electric Cooperative, Inc.	4,297.91
Grayson-Collin Electric Cooperative, Inc.	9,865.95
Houston County Electric Cooperative	9,837.30
Lyntegar (GSEC handles)	4,933.41
Rio Grande Electric	4,279.68
San Miguel Electric Cooperative, Inc.	8,899.24
South Texas Electric Coop	6,580.60
Southwest Texas Electric	412.82
Trinity Valley Electric Cooperative	4,650.38
Wood County Electric Cooperative	824.33
TOTAL	**$59,229.00**

$50,001 and Over

Transmission Service Providers	TOTAL
American Electric Power	$1,913,727.79
City of Bryan	82,836.78
Cross Texas Transmission	427,971.57
Electric Transmission Texas,	2,088,952.71
Garland Power & Light	230,964.76
Lone Star Transmission	589,805.58
Lower Colorado River	4,190,054.83
Sharyland Utilities	244,580.72
Texas Municipal Power	189,032.24
Texas New Mexico Power	141,631.75
Wind Energy Transmission	703,700.27
TOTAL	**$10,803,259.00**

Staff approves charges below $50,000, however anything above $50,000 is approved by PUB and City Council

QUESTIONS?

Water Utilities & Street Operations
901-A Texas Street, Denton, Texas, 76209 • (940) 349-8700

MEMORANDUM

DATE: December 4, 2025

TO: Members of the Public Utilities Board

FROM: Kyle Pedigo, Planning and Engineering Division Manager

SUBJECT: Notice of the submission of an application to the Texas Water Development Board from the Clean Water State Revolving Fund

On November 18, 2025, the City Council approved submitting an application to the Texas Water Development Board (TWDB) for a $60 million low-interest loan from the Clean Water State Revolving Fund (CWSRF) for the Pecan Creek Water Reclamation Plant (PCWRP) Reconstruction Project (Ord. No. 25-1923).

The CWSRF is a federal-state partnership established under the Clean Water Act and managed nationwide by the U.S. Environmental Protection Agency (EPA). In Texas, the program, run by TWDB, offers low-interest wastewater infrastructure loans and ensures project compliance with EPA standards.

TWDB has invited the City of Denton to submit a formal loan application for funding through the CWSRF program. Under the terms of the invitation, the City is eligible to receive a maximum of $60 million in loan funding for State Fiscal Year (SFY) 2026, from September 1, 2025 through August 31, 2026. The remaining amount for the eligible project cost has not yet been committed; it will require reapplication in future funding cycles (e.g., SFY 2027 and beyond), subject to the TWDB's evaluation, ranking, and funding availability.

The City's overall funding plan for the PCWRP includes approximately 49 percent in loans through the U.S. EPA's Water Infrastructure Finance and Innovation Act (WIFIA) program, with the remaining 51 percent through the TWDB's CWSRF program. This combined strategy leverages federal and state financing tools to reduce borrowing costs and enhance cash flow over the project's duration.

A significant advantage of applying for a TWDB loan instead of issuing bonds is the ability to obtain lower interest rates, which lowers overall borrowing costs. Unlike bonds, which often have shorter terms and fixed repayment schedules, CWSRF loans provide more flexible and cost-effective financing. The Application Filing and Authorized Representative Resolution form (TWDB-0201) is a required document in the completed application packet. It designates the authorized representative who has the authority to sign documents, including making payments related to preparing and submitting the application for financial assistance through the TWDB CWSRF program.

Staff are notifying the Public Utilities Board that the application has been submitted to the Texas Water Development Board. If the City is selected for funding, the financing agreement will be presented to the Board for its review and recommendation.

Future Public Utilities Board Agenda Items

Note: This is a working draft of pending PUB items and is subject to change without notice.

Meeting Date	Item	Dept
December 15, 2025		
January 12, 2026	Receive nominations and hold elections for Chair, Vice Chair, and Secretary.	

Codes: Work Session WS, Consent Agenda CA, Individual Consideration IC

PUBLIC UTILITIES BOARD - NEW BUSINESS ACTION ITEMS

	DATE REQUESTED	REQUESTOR	ITEM	DEPT	STATUS
1.					
2.					

City of Denton

City Hall
215 E. McKinney Street
Denton, Texas
www.cityofdenton.com

AGENDA INFORMATION SHEET

DEPARTMENT: **Engineering**

DCM: **Cassandra Ogden**

DATE: **December 15, 2025**

SUBJECT

Receive a report, hold a discussion, and provide suggestions or recommendations regarding updates to the City of Denton Design Criteria Manual.

BACKGROUND

To assist developers and design professionals in preparing and submitting required plans and permits for proposed developments, staff has prepared updates to the Design Criteria Manual listed below. Staff has taken the approach to provide periodic updates and modifications to the Design Criteria Manual to keep the document up to date with current design and construction standards, as well as address issues observed during construction, and operation and maintenance of public facilities.

In July 2024 the Solid Waste and Recycling Criteria Manual, Stormwater Design Criteria Manual, Transportation Design Criteria Manual, the Water and Wastewater Criteria Manual, and the Streetlight Design Criteria were updated to combine the five manuals into a single document, formatted to be uniform and consistent with the Denton Development Code. Following this significant update to the design document, Staff is proposing some additional updates to increase options for development within the City while ensuring all public infrastructure is designed and constructed to a high quality.

Solid Waste and Recycling Design Criteria Manual

- Provides design requirements for single and dual side-load commercial container enclosures.

Stormwater Design Criteria Manual

- In addition to reinforced concrete, polypropylene will now an allowed material for public storm drain systems.
- Detention structures will no longer required to be designed for extended detention for water quality.
- Any development disturbing more than one acre must treat their stormwater runoff either through extended detention or include site development controls necessary to remove 80% of the total suspended solids.

Transportation Design Criteria Manual

- Adds a new street classification – ‘Major Collector’

- Revises the roadway geometry standards table. Adds secondary arterial (one-way), major collector, and added additional notes guiding the development applications.

- Removes the Bike-Ped TIA requirement.

- Updates 'on-street' parking requirements

- Revises the Fire Apparatus access road standards.

Water and Wastewater Design Criteria Manual

- Revises order of sections & consolidate information into relevant sections/subsection.

- Specifies a maximum daily demand and fire flow velocity limits within the water distribution system.

- Requires geotechnical studies and reports during design.

- Provides additional design criteria for lift stations including generator design, hoist requirements, and instrumentation and controls updates.

Streetlight Design Criteria Manual

- Provides a new style of light as an alternate for the 35' white concrete poles.

- Updates part descriptions for clarity.

- Provides updated process information on how streetlight changes are processed.

Environmentally Sensitive Areas Design Criteria Manual

Additionally, a new section has been added to the Design Criteria Manual to provide requirements for developing in Environmentally Sensitive Areas (ESAs). This new section addresses the process for how to identify ESAs, how to assess ESAs, and how ESAs must be preserved and restored.

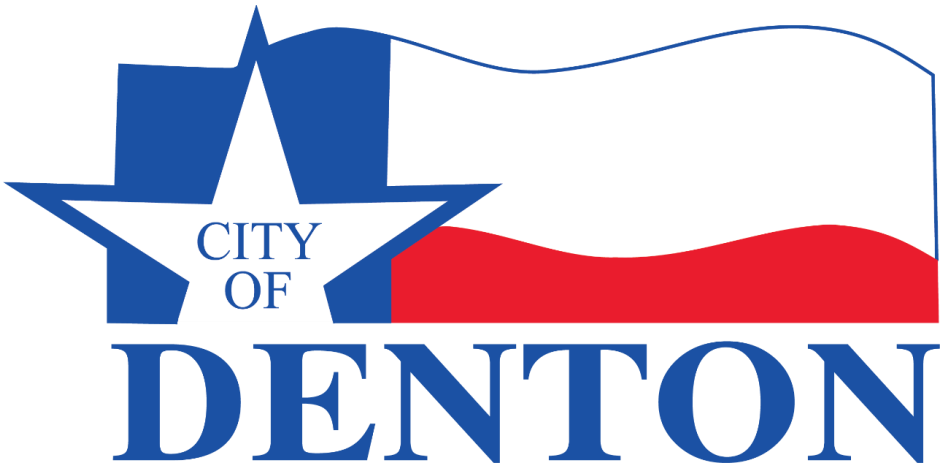
PUBLIC OUTREACH

To give an opportunity for the public to provide feedback on the draft Design Criteria Manual updates, staff hosted a Developer Town Hall meeting on October 22, 2025. At the Town Hall meeting, the same Design Criteria Manual updates were presented to the attendees who had the opportunity to ask questions and/or provide comments.

EXHIBITS

Exhibit 1 – Agenda Information Sheet
Exhibit 2 – Draft Denton Design Criteria Manual Update – Clean Copy
Exhibit 3 – Draft Denton Design Criteria Manual Update – Redline Copy
Exhibit 4 – Presentation

Respectfully submitted:
Mike Linder, PE, CFM
Drainage Engineer



Design Criteria Manual

Published: January 2026

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Section 1: Introduction

1.1 Title and Effective Date

1.1.1 This document is the Design Criteria Manual of the City of Denton, Texas. It shall be officially known and cited as the "Denton Design Criteria Manual," and is referred to internally in this document as "this DCM" and "this Manual."

1.1.2 This DCM shall become effective on January 1, 2026.

1.2 Purpose

The purpose of the Denton Design Criteria Manual is to provide minimum, non-exhaustive guidelines for the design and construction of ***solid waste, stormwater, transportation, water and wastewater, and streetlight infrastructure*** within the City of Denton, Texas and its extraterritorial jurisdictions. The criteria established in this Manual have been developed from a review of various applicable publications, regulatory requirements, and City of Denton offices which oversee the design, construction and maintenance of the facilities.

These guidelines are to be used by design engineers in the City of Denton Capital Projects and Engineering Department, consulting engineers employed by the City, and engineers of subdivision and land development infrastructure projects proposed for construction and acceptance by the City, within the City and its extraterritorial jurisdictions.

Along with this Manual, the Denton Development Code (DDC) and relevant submittal checklists should be consulted for additional criteria. ***The criteria established in this Manual do not supersede the criteria contained in the DDC.*** In the case of conflict among this Manual, City of Denton Standard Details, or other cited regulations and standards, the more stringent requirement shall apply.

This DCM is ***not*** intended to be an all-inclusive design document for all circumstances and conditions. The DDC and City of Denton Code of Ordinances must be consulted for possible impacts to the proposed design. The Federal Government, the State of Texas, NCTCOG, Denton County, Denton County Transit Authority (DCTA), and other related organizations and resources should be consulted for additional criteria, as may be deemed necessary.

1.3 Organization

In addition to the design criteria established in this DCM, guidance is also provided for design deviations from the required design criteria. The contents of this Manual are categorized into sections shown below:

A. Section 1: Introduction
B. Section 2: Abbreviations and Definitions
C. Section 3: Solid Waste Design
D. Section 4: Stormwater Design
E. Section 5: Transportation Design
F. Section 6: Water and Wastewater Design
G. Section 7: Streetlight Design Criteria
H. Section 8: Design Deviations

Section 2: Abbreviations and Definitions

2.1 Abbreviations

AASHTO	American Association of State Highway and Transportation Officials
ADA	Americans with Disabilities Act
APBP	Association of Pedestrian and Bicycle Professionals
ASTM	American Society for Testing and Materials
AWSC	All-Way Stop Control
AWWA	American Water Works Association
BFE	Base Flood Elevation
BFR	Barrier Free Ramp
BOC	Back of Curb
BMP	Best Management Practices
CCN	Certificate of Convenience and Necessity
cfs	cubic feet per second
CLOMR	Conditional Letter of Map Revision
COA	Condominium Owner's Association
CP	Cathodic Protection
cu. ft.	cubic feet
cu. in.	cubic inches
DCAD	Denton Central Appraisal District
DCM	Design Criteria Manual
DCTA	Denton County Transit Authority
DDC	Denton Development Code
DFW	Dallas-Fort Worth Metroplex
DIP	Ductile-Iron Pipe
DRP	Development Review Process
DSA	Down Stream Assessment
EOL	End-of-Line
ESA	Environmentally Sensitive Area
ft.	foot or feet
FEMA	Federal Emergency Management Agency
FFE	Finished Floor Elevation

FHWA	Federal Highway Administration
FIRM	Federal Insurance Rate Map
FIS	Flood Insurance Study
FM	Farm to Market
fps	feet per second
FSE	Food Service Establishment
gal.	gallon(s)
GPCD	gallons per capita per day
GPD	gallons per day
GPM	gallons per minute
GPS	Global Positioning System
HDPE	High Density Polyethylene
HEC-HMS	Hydrologic Engineering Center's Hydrologic Modeling System
HEC-RAS	Hydrologic Engineering Center's River Analysis System
HGI	Hydromechanical Grease Interceptor
HGL	Hydraulic Grade Line
HOA	Home Owners' Association
IBC	International Building Code
ID	Inner Diameter
IFC	International Fire Code
IH	Interstate Highway
in.	inch(es)
IPC	International Plumbing Code
ITE	Institute of Transportation Engineers
*i*SWM™	Integrated Stormwater Management
kg.	kilogram(s)
lb.	pound or pounds
LOMR	Letter of Map Revision
LOS	Level-of-Service
MEP	Mechanical, Electrical, and Plumbing
MGD	Million Gallons per Day
mL	milli-liter(s)
mph	miles per hour

NAVD	North American Vertical Datum
NCHRP	National Cooperative Highway Research Program Report
NCTCOG	North Central Texas Council of Governments
NFIP	National Flood Insurance Program
NFPA	National Fire Protection Association
NGVD	National Geodetic Vertical Datum
NOAA	National Oceanic and Atmospheric Administration
PHT	Peak-Hour Trips
PMF	Probable Maximum Flood
PMP	Probable Maximum Precipitation
POA	Property Owners' Association
POTW	Publicly Owned Treatment Works
PROWAG	Public Rights of Way Accessibility Guidelines
psi	pounds per square inch
PUCT	Public Utilities Commission of Texas
PUE	Public Utility Easement
PVC	Polyvinyl Chloride
PZC	Planning and Zoning Commission
RCP	Reinforced Concrete Pipe
ROW	Right-of-Way
RPBA	Reduced Pressure Backflow Assembly
SCADA	Supervisory Control and Data Acquisition
SCS	Soil Conservation Service
SDR	Standard Dimension Ratio
SFE	Single-Family Equivalent
SETP-PD	Safety End Treatment Plan – Parallel Drainage
SFHA	Special Flood Hazard Area
SH	State Highway
sq. ft.	square feet
sq. mi.	square mile(s)
SWFMA	Stormwater Facility Maintenance Agreement or Maintenance Agreement
TAC	Texas Administrative Code
TAS	Texas Accessibility Standards

TCEQ	Texas Commission on Environmental Quality
TDLR	Texas Department of Licensing and Registration
TGA	Trip Generation Assessment
TIA	Traffic Impact Analysis
TMUTCD	Texas Manual on Uniform Traffic Control Devices
TSS	Total Suspended Solids
TxDOT	Texas Department of Transportation
U.S.	United States of America
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
VPD	Vehicle-trips per day
WOTUS	Waters of the United Stated of America
WMP	Water Master Plan
WSEL	Water surface elevation
w.s.f.u.	Water-Supply Fixture-Unit(s)
ZOI	Zone of Influence

2.2 Definitions

20-Year Horizon
The estimated traffic volume for the study area based on a 20-year growth period.

100-year Event
Event (rainfall or flood) that has a 1% chance of being equaled or exceeded in any given year.

Abutment
A wall supporting the end of a bridge or span and sustaining the pressure of the bordering earth.

Applicant
Any firm, entity, partnership, company, public utility company, or individual that submits a formal request or application.

Apron
A floor or lining of concrete, timber, or other suitable material at the toe of a dam, entrance or discharge side of a spillway, a chute, or other discharge structure, to protect the waterway from erosion from falling water or turbulent flow.

Area of Special Flood Hazard
The area designated as subject to flooding from the 1% chance flood on the flood insurance rate map. For purposes of these criteria, the term "special flood hazard area" is synonymous in meaning with the phrase "area of special flood hazard" and may be referred to as "SFHA".

Backwater
The rise of the water level upstream due to an obstruction or constriction in the channel.

Backwater Curve
The term applied to the longitudinal profile of the water surface in an open channel when flow is steady but non-uniform.

Baffles
Deflector vanes, guides, grids, gratings, or similar devices constructed or placed in flowing water, to: (1) check or effect a more uniform distribution of velocities; (2) absorb energy; (3) divert, guide, or agitate the stormwater flow; and (4) check eddy currents.

Baffle Chute
A drop structure in a channel with baffles for energy dissipation to permit the lowering of the hydraulic energy gradient in a short distance to accommodate topography.

Base Flood Elevation
The elevation shown on the Flood Insurance Rate Map (FIRM) and found in the accompanying Flood Insurance Study (FIS) for Zones A, AE, AH, A1-30, AR, V1-30, or VE that indicates the water surface elevation resulting from the flood that has a 1% chance of equaling or exceeding that level in any given year.

Calibration
Process of checking, adjusting, or standardizing operating characteristics of instruments and model appurtenances on a physical model or coefficients in a mathematical model. The process of evaluating the scale readings of an instrument in terms of the physical quantity to be measured.

Carrier Pipe
A pipe used to carry stormwater, water, or wastewater, as opposed to an exterior protective casing pipe.

Casing Pipe
An exterior protective pipe that encases a carrier pipe for various types of crossings, including roadways, creeks, and railroads. Also known as encasement pipe.

Channel
A man-made drainageway or watercourse, generally constructed to straighten a stream or increase its capacity.

Channel Roughness
Irregularities in channel configuration which attenuate the flow of water and dissipate its energy.

Chute
An inclined conduit or structure used for conveying water to a lower level.

City's Engineer
A Professional Engineer, licensed by the State of Texas, who is the subject matter expert of the relevant topic of discussion, and employed by the City of Denton.

Conduit
Any open or closed structure for conveying flowing water.

Corner Clip
ROW dedication at intersection corners to provide sufficient room for intersection visibility, pedestrian access, and other street facilities.

Critical Flow
The state of flow for a given discharge at which the specific energy is a minimum with respect to the bottom of the conduit. The Froude Number is equal to 1.0 for critical flow conditions.

Crown
The highest point on a transverse section of conduit or the highest point of a roadway cross-section.

Culvert
Large pipe or other conduit through which a small stream passes under a road or street.

Curb
A vertical or sloping structure located along the edge of a roadway, normally constructed integrally with the gutter, which strengthens and protects the pavement edge and clearly defines the pavement edge to vehicle operators.

Dam
A barrier constructed across a watercourse for the purpose of creating a reservoir or diverting water from a conduit or channel.

Degradation
The progressive general lowering of a stream channel by erosion, other than that caused by a constriction.

Department Reviewer
A member of a City of Denton department, designated by the Department Director, with subject matter expertise related to the Design Criteria Manual who is designated as being responsible for the review of design deviation requests.

Depression Storage
Collection and storage of rainfall in natural depressions after exceeding infiltration capacity of the soil.

Design Storm or Flood
The storm or flood which is used as the basis for design.

Detention
The storage of storm runoff for a controlled release during or immediately following the design storm.
1. Off-site detention - A detention pond located outside the boundary of the area it serves.
2. On-site detention - A detention pond which is located within and serves only a specific site or subdivision.
3. Regional detention - Detention facilities provided to control excess runoff based on a watershed-wide hydrologic analysis.

Development
Any man-made change to improved or unimproved real estate, including but not limited to, buildings or other structures, paving, drainage, or utilities. Development activities include: subdivision of land; construction or alteration of structures, roads, parking, fences, pools, signs, temporary uses, utilities, and other facilities; installation of septic systems; grading; excavation, mining or drilling operations; deposit of refuse, debris, or fill materials; and clearing of natural vegetative cover (with the exception of agricultural activities as defined and as permitted). Routine repair and maintenance activities are exempted.

Development Project Facilitation
Division within the City of Denton that assists developers move projects through the City's various development review process and authorized to process the review of design deviation requests.

Drop Structures
A sloping or vertical section of a channel designed to reduce the elevation of flowing water without increasing its velocity.

Energy Dissipaters
Engineered devices such as riprap aprons or concrete baffles placed at the outlet of storm water conveyance systems for the purpose of reducing the velocity, energy and turbulence of the discharged flow.

Entrance Head
The head required to cause flow into a conduit or other structure; it includes both entrance loss and velocity head.

Entrance Loss
Head lost in eddies or friction at the inlet to a conduit, headwall or structure.

Existing Traffic
Existing traffic conditions based on the most recent traffic counts. Existing traffic conditions do not include the traffic created or associated with the development.

Flash Flood
A flood of short duration with a relatively high peak rate of flow, usually resulting from a high intensity rainfall over a small area.

Flood Control
The elimination or reduction of flood losses by the construction of flood storage reservoirs, channel improvements, dikes and levees, by-pass channels, or other engineering works.

Flood Hazard Area
Area subject to flooding by 1% chance floods.

Flood Management or Flood Hazard Mitigation
Any program or activity designed to reduce damages from flooding, including stream erosion.

Floodplain
The area that is subject to flooding from the 1% chance flood. The floodplain includes the regulatory floodway and floodway fringe.

Floodway
The channel and adjacent lands of a watercourse that must be reserved in order to discharge the base flood without increasing the water surface elevation more than the regulatory designated height.

Floodway Fringe
The area located within the floodplain and outside the floodway.

Freeboard
The distance between the normal operating level and the top of the side of an open conduit left to allow for wave action, floating debris, or any other condition or emergency without overtopping the structure.

Frequency (of storms, floods)
Average recurrence interval of events, over long periods of time. Mathematically, frequency is the reciprocal of the exceedance probability.

Froude Number
A flow parameter, which is a measure of the extent to which gravitational action affects the flow. A Froude number greater than one (1) indicates supercritical flow and a value less than 1 subcritical flow. The simplest

form of the Froude number is given by the following equation:

$$F = V / (g D)^{0.5} \quad \textbf{[Eqn. 2.1]}$$

Where: V = Velocity
g = the acceleration due to gravity (32.2 ft/s^2)
D = depth

Fully Developed Conditions
A description of hydrologic conditions in a watershed, if the watershed has been completely built out based on the zoning and future land use maps of the City. If there is no designated future land use, the runoff coefficient will be assumed to be (0.6) for purposes of determining fully developed water surface elevations. This term is interchangeable with the term "Ultimate Developed Conditions". This is not to be confused with a Developed Floodplain as defined in Subchapter 9.2 of the DDC, which refers to the character of the streambed itself.

Gabion
A wire container filled with rock and used in the construction of dams, retaining walls, and protection against erosion.

Grade
1. The inclination or slope of a channel, canal, conduit, etc., or natural ground surface, usually expressed in terms of the percentage of number of units of vertical rise (or fall) per unit of horizontal distance.
2. The elevation of the invert of the bottom of a conduit, canal, culvert, sewer, etc.
3. The finished surface of a canal bed, road bed, top of an embankment, or bottom of excavation.

Gutter
A generally shallow waterway adjacent to a curb used to convey stormwater.

Headwater
1. The upper reaches of a stream near its sources;
2. The region where ground waters emerge to form a surface stream;
3. The water upstream from a structure.

Hydraulic Control
The hydraulic characteristic which determines the stage-discharge relationship in a conduit. The control is usually critical depth, tailwater depth, or uniform depth.

Hydraulic Grade Line
A line representing the pressure head available at any given point within the system.

Hydraulic Gradient
A hydraulic profile of the piezometric level of the water, representing the sum of the depth of flow and the pressure head. In open channel flow it is the water surface.

Hydraulic Jump
The hydraulic jump is an abrupt rise in the water surface which occurs in an open channel when water

flowing at supercritical velocity is retarded by water flowing at subcritical velocity. The transition through the jump results in a marked loss of energy, evidenced by turbulence of the flow within the area of the jump. The hydraulic jump is sometimes used as a means of energy dissipation.

Hydraulics
A branch of science that deals with practical applications of the mechanics of water movement.

Hydrograph
A graph showing stage, flow, velocity, or other property of water versus time at a given point on a stream or conduit. Examples include: Dimensionless Unit hydrograph, Unit Hydrograph.

Hydrology
The science dealing with the properties, distribution, and circulation of water on and below the Earth's surface and in the atmosphere.

Hyetograph
A histogram or graph of rainfall intensity versus time of storm.

Impervious
A term applied to a material through which water cannot pass or passes with great difficulty.

Infiltration
1. The entering of water through the interstices or pores of a soil or other porous medium.
2. The entrance of water from the ground into a sewer or drain through breaks, defective joints, or porous walls.
3. The absorption of water by the soil, either as it falls as precipitation, or from a stream flowing over the surface.

Inlet
Inlets are drainage structures used to collect surface water through grate or curb openings and convey it to storm drains or direct outlet to culverts.
Inlets used for the drainage of roadway surfaces can be divided into four major classes:
1. Grate Inlets – These inlets include grate inlets consisting of an opening in the gutter covered by one or more grates, and slotted inlets consisting of a pipe cut along the longitudinal axis with a grate or spacer bars to form slot openings.
2. Curb-Opening Inlets – These inlets are vertical openings in the curb covered by a top slab.
3. Combination Inlets – These inlets usually consist of both a curb-opening inlet and a grate inlet placed in a side-by-side configuration, but the curb opening may be located upstream of the grate.
4. Drop Inlet (Y-Inlet) -A storm drain intake structure typically located in unpaved areas. The inlet may extend above the ground level with openings on one or more sides of the inlet or it may be flush with the ground with a grated cover.

Intensity
As applied to rainfall, a rate usually expressed in inches per hour.

Interception
As applied to hydrology, refers to the process by which precipitation is caught and held by foliage, twigs,

and branches of trees, shrubs and buildings, never reaching the surface of the ground, and then lost by evaporation.

Invert
The floor, bottom, or lowest portion of the internal cross-section of a conduit.

Lag Time
The time difference between two occurrences such as between rainfall and runoff or pumping of a well and effect on the stream. *See* Time of Concentration.

Level of Service
A qualitative measure of traffic flow and congestion, representing quality of service. It describes operational conditions within a traffic stream, generally described in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety.

Lining
Impervious material such as concrete, clay, grass, plastic, puddled earth, etc., placed on the sides and bottom of a ditch, channel, and reservoir to prevent or reduce seepage of water through the sides and bottom and/or to prevent erosion.

Lip
A small wall on the downstream end of an apron to break the flow from the apron.

Major Stream
Waterways with a contributing drainage area of one square mile or more.

Manning's Coefficient
The coefficient of roughness used in Manning's Equation for flow in open channels.

Manning's Equation
A uniform flow equation used to relate velocity, hydraulic radius and the energy gradient slope.

Median
The portion of a divided roadway separating the opposing traffic flows. A median may be traversable or non-traversable.

Median Opening
An opening in a non-traversable median that allows accessing or crossing the opposing traffic lanes.

Minimum building elevation
The elevation to which new and substantially improved structures within the floodway or within 200 feet of the floodplain or SFHA are required to be elevated or floodproofed. This elevation would be equal 18 inches above the 100-year water surface elevation based on fully developed conditions or 30 inches above the BFE as indicated in the flood insurance study or, if the BFE is unavailable, 30 inches above the 100-year flood elevation based on current development watershed conditions.

Model
Mathematical systems analysis by computer, applied to evaluate rainfall-runoff relationships; simulate watershed characteristics, predict flood and reservoir routings, or use other aspects of planning.

Nappe
The sheet or curtain of water overflowing a weir or dam. When freely overflowing any given structure, it has a well-defined upper and lower surface.

Open Channel
A conduit in which water flows with a free surface.

Orifice
1. An opening with closed perimeter, and of regular form in a plate, wall, or partition through which water may flow.
2. The end of a small tube, such as a Pilot tube, piezometer, etc.

Peak Flow (Peak Rate of Runoff)
The maximum rate of runoff during a given runoff event.

Percolation
To pass through a permeable substance such as ground water flowing through an aquifer.

Permeability
The property of a material which permits movement of water through it when saturated and actuated by hydrostatic pressure.

Pervious
Applied to a material through which water passes relatively freely.

Pilot Channel
A constructed pathway that guides base streamflow or runoff along a specified route through a drainage facility or drainage feature.

Porosity
1. An index of the void characteristics of a soil or stratum as pertaining to percolation; degree of perviousness.
2. The ratio, usually expressed as a percentage, of (a) the volume of the interstices in a given quantity of material, to (b) the total volume of the material.

Positive Overflow
When the inlets do not function properly, or when the design capacity of the conduit is exceeded, the excess flow must be conveyed overland along a paved course. This could mean along a street or alley but could require a concrete flume and the dedication of special drainage easements on private property.

Post-development
The condition of the given site and drainage area after the anticipated development has taken place.

Precipitation
Any moisture that falls from the atmosphere, including snow, sleet, rain and hail.

Pre-development
The condition of the given site and drainage area prior to development.

Probable Maximum Flood
The flood that may be expected from the most severe combination of critical meteorological and hydrologic conditions that are reasonably possible in the region.

Probable Maximum Precipitation
The critical depth-duration-area rainfall relationship for a given area during the seasons of the year which would result from a storm containing the most critical meteorological conditions considered probable of occurring.

Projected Growth Rate
The estimated growth rate per year for the study area based upon the average growth in the previous 5-year period along arterials in the vicinity of the proposed project.

Proposed Site Traffic Volumes
The number of vehicles per day and per hour projected to be generated by the development.

Rainfall Duration
The length of time over which a single rainfall event occurs.

Rainfall Frequency
The average recurrence interval of rainfall events.

Rainfall Intensity
The rate of accumulation of rainfall, usually in inches or millimeters per hour.

Rational Formula
A traditional method of computing peak flow using intensity of the storm rainfall.

Reach
Any length of river or channel. Usually used to refer to sections which are uniform with respect to discharge, depth, area or slope, or sections between gaging stations.

Recurrence Interval
The average interval of time within which a given event will be equaled or exceeded once. For an annual series (as opposed to a partial duration series) the probability of occurrence in anyone year is the inverse of the recurrence interval. Thus, a flood having a recurrence interval of 100 years has a 1% probability of being equaled or exceeded in any one year.

Regulatory Floodway
The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a

designated height.

Retention
The storage of a portion or all of the storm runoff for purposes of permanent use of the retained water. Retention facilities are similar to detention facilities with the main difference being that all of the storm runoff will not be released to the downstream drainage network.

Return Period
See Recurrence Interval

Reynold's Number (Re)
A flow parameter which is a measure of the viscous effects on the flow. Typically defined as shown in the equation below:

$$Re = (V. D) / \nu \qquad \textbf{[Eqn. 2.2]}$$

Where: V = Velocity
D = Depth
ν = kinematic viscosity of the fluid

Riprap (Revetment)
Forms of bank protection, usually using rock or concrete.

Routing
Routing is a technique used to predict the temporal and spatial variations of a flood wave as it traverses a river reach or reservoir. Generally, routing technique may be classified into two categories - hydrologic routing and hydraulic routing.

Right-of-Way
A designated section of a street, sidewalk, alley, waterway or utility easement and/or related facilities, that is dedicated for municipal usage.

Right-of-Way Width
The shortest horizontal distance between the lines which delineate the right-of-way of a street.

Runoff
That part of the precipitation which reaches a stream, drain, sewer, etc., directly or indirectly.
1. Direct Runoff - The total amount of surface runoff and subsurface storm runoff which reaches stream channels.
2. Overland Runoff - Water flowing over the land surface before it reaches a definite stream channel or body of water.

Runoff Coefficient
A decimal number used in the Rational Formula which defines the runoff characteristics of the drainage area under consideration. It may be applied to an entire drainage basin as a composite representation or it may be applied to a small individual area such as one residential lot.

Runoff Total
The total volume of flow from a drainage area for a definite period of time such as a day, month, or a year, or it may be for the duration of a particular storm.

Scour
The erosive action of running water in streams or channels in excavating and carrying away material from the bed and banks.

SCS Runoff Curve Number
Index number used by the National Resource Conservation Service, formerly the Soil Conservation Service, as a measure of the tendency of rainfall to run off into streams rather than evaporate or infiltrate.

Sediment
Material of soil and rock origin transported, carried, or deposited by water.

Sedimentation Basin
A sediment control basin required to catch runoff from common drainage areas with 10 acres or more disturbed at one time during any phase of development that dewaters from the surface unless infeasible.

Sidewalk
A paved area within the street ROW or sidewalk easement specifically designed for pedestrians and/or bicyclists.

Sight Distance
The distance visible to the driver of a passenger vehicle measured along the normal travel path of a roadway from a designated location and to a specified height above the roadway when the view is unobstructed by traffic.

Slope, Critical
The slope or grade of a channel that is exactly equal to the loss of head per foot resulting from flow at a depth that will give uniform flow at critical depth; the minimum slope of a conduit which will produce critical flow.

Slope, Friction
The friction head or loss per unit length of channel or conduit. For uniform flow the friction slope coincides with the energy gradient, but where a distinction is made between energy losses due to bends, expansions, impacts, etc., a distinction must also be made between the friction scope and the energy gradient. The friction slope is equal to the bed or surface slope only for uniform flow in uniform open channels.

Soffit
In a stormwater pipe, the uppermost point of the interior of the pipe wall. The crown is the uppermost point on the outside of the pipe wall.

Spillway
A waterway in or about a dam or other hydraulic structure, for the overflow of excess water.

Standard Details
A collection of uniform detail drawings of structures or devices adopted as standard construction details by the City of Denton.

Steady Flow
Open channel flow is said to be steady if the depth of flow does not change or if it can be assumed to be constant during the time interval of consideration.

Stormwater Facility Maintenance Agreement or Maintenance Agreement
A legal agreement between the City of Denton and a property owner, including HOAs and POAs, for perpetual maintenance of a structural BMP.

Stream
A natural drainageway that conveys stormwater, may also be referred to as a creek. References to a stream or creek in this Manual refer to the entire stormwater carrying component of the stream to the limits of the floodplain, not just to the streambed.

Stilling Basin
Pool of water conventionally used, as part of a drop structure or other structure, to dissipate energy.

Stopping Sight Distance
The distance required by a driver of a vehicle, traveling at a given speed, to bring the vehicle to a stop after an object on the roadway becomes visible. It includes the distance traveled during driver perception time, reaction time, and the vehicle braking distance.

Storage Length
The portion of an auxiliary lane required to store the number of vehicles expected to accumulate in the lane during an average peak period.

Storm Hydrology
The branch of hydrology that concentrates on the calculation of runoff from storm rainfall.

Stormwater Management
The control of storm runoff on-site or on small streams, by means of land use restrictions, detention storage, erosion control, and/or drainage measures.

Stormwater Model
Mathematical representation of a stormwater network.

Study area
The boundaries of the assessment area as determined by the City's Engineer.

Subcritical Flow
The Froude Number is less than 1.0 for subcritical flow conditions.

Supercritical Flow
The Froude Number is greater than 1.0 for supercritical flow conditions.

Tailwater
The depth of flow in the stream directly downstream of a drainage facility.

Time of Concentration
The estimated time in minutes required for runoff to flow from the most remote section of the drainage area to the point at which the flow is to be determined.

Total Head Line (Energy Line)
A line representing the energy in flowing water. The elevation of the energy line is equal to the elevation of the flow line plus the depth plus the velocity head plus the pressure head.

Traffic Queue
Vehicles within a storage queue awaiting traffic movement in a single lane, within one traffic signal cycle.

Trash Rack
Racks, gratings, or mesh designed so as to prevent leaves and rubbish from plugging the outlets from a dam or detention basin.

Trip Distribution
An estimate of the spatial pattern of trips or other flows between given sets of origins and destination pairs. Trip distribution models connect the trip origins and destination, estimated by the trip generation models to create estimated trips based on the Base year and Buildout years (24 hour counts or turning movement counts). Different trip distribution models are developed for each of the trip purposes for which trip generation has been estimated.

Trunk Line
The main line of a storm drain system extending from manhole to manhole or from manhole to outlet structure.

TxDOT Highways
State-operated highways that include Farm to Market (FM) roadways, State Highways (SH), Interstate Highway (IH), IH Frontage Roads, and United States (US) Highways.

Uniform Channel
A channel with a constant cross-section and roughness.

Uniform Flow
Open channel flow is said to be uniform if the depth of flow is the same at every section of the channel.

Unit Hydrograph
The direct runoff hydrograph resulting from one inch of precipitation excess distributed uniformly over a watershed for a specified duration.

Valley Storage
Refers to the water storage capacity of a stream and is a volume that is measured below the base flood elevation. Restrictions on loss of valley storage refer to compensation for the loss of storage caused by fill below the base flood elevation.

Velocity Head
The energy per unit weight of water due to its velocity (v). The velocity head also represents the vertical distance water must fall freely under gravity to reach its velocity (v). The velocity head can be computed from the following equation:

$$\text{Velocity Head} = v^2 / 2g \qquad \textbf{[Eqn. 2.3]}$$

Where: v = velocity
g = acceleration due to gravity (32.2 ft/s^2)

Water Year
The water year commonly used in the United States is the period from October 1 to September 30 of the following calendar year.

Watershed
The area contributing storm runoff to a stream or drainage system. Other terms are drainage area, drainage basin and catchment area.

Zone of Influence
A point downstream where the increased discharge from a proposed development results in 0.00' increase in flood elevation.

Section 3: Solid Waste Design Criteria

3.1 Overview

The purpose of Section 3 - Solid Waste Design Criteria of this DCM is to provide basic criteria and standards for the development and maintenance of solid waste and recycling container enclosures.

The Solid Waste Design Criteria established in this Manual shall apply as set forth in:

A. City of Denton Code of Ordinances – Chapter 24,

B. DDC Subchapter 7, Section 7.2 – Applicability, and

C. DDC Subchapter 7, Section 7.12 – Solid Waste and Recycling Design Standards.

The City Code of Ordinances states that the City of Denton shall be the exclusive provider of solid waste collection and disposal services within the City Limits including, but not limited to, services provided for preconstruction activities, construction activities, and residential, multifamily, and commercial activities. All contractors and subcontractors should call City of Denton Customer Service (940-349-8700) to initiate service. Third-party solid waste providers may not be used for any on-site solid waste services within the City Limits.

3.2 Design Standards

3.2.1 General

A. Nonresidential on-site solid waste and recycling container enclosures shall be located on each platted lot of non-residential property and shall be constructed and maintained by the property owner or developer and made available for use by the City of Denton Solid Waste Department or commercial recycling service provider.

B. Nonresidential on-site solid waste and recycling container enclosures shall be available for the storage of all municipal solid waste and recyclables generated for each platted property. The City reserves the ability to determine whether any parcel or area (For example, Downtown Square, strip centers, multifamily residential, etc.) must have shared container service or an alternative service. Container enclosures shall be of adequate size to contain all solid wastes, liquid wastes, and recyclables generated on the property, including, but not limited to, municipal solid waste, recyclables, grease and oils, process by-products and wastes, hazardous waste, medical waste, and any special wastes, contained in accordance with Chapter 24, City of Denton Code of Ordinances.

C. The container enclosures shall meet the Container Enclosure and Storage Space Dimensional Requirements prescribed in Section 3.2.2 of this Manual, as well as Chapter 469 of the Texas Government Code, as amended.

D. New nonresidential uses of 999 square feet ("sq. ft.") or less will be evaluated by City staff to determine the applicability of constructing an enclosure. Trash and recycling carts may be appropriate, thereby eliminating the need for the construction of an enclosure.

E. Cart storage may be utilized on property converted from a residential to non-residential use if the converted property is a structure of less than 2,500 gross sq. ft., has a waste generation rate applicable for cart service, and is in an area where commercial cart service is available.

F. Proposed future building expansion (evaluated at 50% or more of the current square footage) and

phased development shall be considered in site design with regard to sizing, location(s), and access of future solid waste and recyclables container enclosures. Solid waste and recycling areas necessary for future building expansion shall be available, but need not be utilized, nor container enclosures constructed, until future building expansion occurs.

G. Containers for solid waste and recycling service shall be screened from the public right-of-way ("ROW") and from adjacent property owners.

H. Proper construction of the container enclosures shall be completed prior to final approval of the development or property by the City's Solid Waste Department.

I. Container enclosure designs shall be consistent with the engineering drawings and specifications shown in the Solid Waste and Recycling Container Enclosure Construction Drawings in the City of Denton Standard Details.

3.2.2 Container Enclosure and Storage Space Dimensional Requirements

A. All single front-load commercial container enclosures shall have inside walls with dimensions measuring a minimum of 13 feet wide and 11.5 feet deep. The Rear face of the bollard must be three (3) feet from the rear of the enclosure and the front of the bollard must be eight (8) feet from the front of the enclosure, leaving six (6) inches of space equal to the size of the bollard. Only solid waste and recycling containers are allowed in the enclosures. Other storage containers such as grease and oil receptacles, and other items shall be stored and located in a different enclosure. These enclosures shall be located where they will not impede the service of the solid waste and/or recycling containers.

B. All dual front-load commercial container enclosures shall have inside walls with dimensions measuring 26 feet wide and 11.5 feet deep. The Rear face of the bollard must be three (3) feet from the rear of the enclosure and the front of the bollard must be eight (8) feet from the front of the enclosure, leaving six (6) inches of space equal to the size of the bollard. Only solid waste and recycling containers are allowed in the enclosures. Other storage containers such as grease and oil receptacles, and other items shall be stored and located in a different enclosure. These enclosures shall be located where they will not impede the service of the solid waste and/or recycling containers.

C. In the rare case where it is not possible to fit typical front-load enclosures as required above, a design deviation request may be submitted to the City's Solid Waste Department for the consideration of the following two alternatives:

1. Single side-load commercial container enclosures having inside walls with dimensions measuring a minimum of 10 feet wide and eight (8) feet deep. The Rear face of the bollard must be one (1) foot from the rear of the enclosure, and the front of the bollard must be 6.5 feet from the front of the enclosure, leaving six (6) inches of space equal to the size of the bollard. Only solid waste and recycling containers are allowed in the enclosures.

2. Dual side-load commercial container enclosures having inside walls with dimensions measuring 20 feet wide and eight (8) feet deep. The Rear face of the bollard must be one (1) foot from the rear of the enclosure, and the front of the bollard must be 6.5 feet from the front of the enclosure, leaving six (6) inches of space equal to the size of the bollard. Only solid waste and recycling containers are allowed in the enclosures.

D. All roll-off compactor enclosures shall have inside walls with dimensions measuring a minimum of 16 feet wide. The depth of the inside walls must accommodate the compactor size selected.

E. The City of Denton Standard Details contain the required construction specifications for container enclosures and storage spaces.

F. All developments shall be required to install container enclosures as specified in Table 3.2-A .

G. Nonresidential uses that are not required to meet the above storage space and enclosure requirements, will be reviewed for adequate solid waste and recyclables enclosures based on site-specific information and the following Solid Waste and Recycling Design Factors:

1. Type of business;
2. Waste generation potential;
3. Waste generation of similar businesses;
4. Square footage of the development and structures;
5. Number of floors;
6. Location of the business;
7. Hours of business operation;
8. Business site plan; and
9. Phased development and future use plans.

Table 3.2-A: Minimum Container Enclosure Requirements

Development Use	Required Enclosure(s) or Container(s)
RESIDENTIAL	
Single-family	Residential curbside cart pick-up
Townhomes – 4 units or fewer	
RESIDENTIAL - MULTIFAMILY	
5 – 48 units	2 front-load containers enclosed
49 – 64 units	3 front-load containers enclosed
65 – 200 units	1 compactor and 1 front-load container for recycling or 4 front-load containers enclosed
200+ units	1 compactor and 1 front-load container enclosed
GENERAL COMMERCIAL	
1 – 15,000 sq. ft.	2 front-load containers enclosed
15,001 – 50,000 sq. ft.	3 front-load containers enclosed
50,001 – 200,000 sq. ft.	1 compactor and 1 front-load container for recycling or 4 front-load containers enclosed
Over 200,000 sq. ft.	1 compactor and 1 front-load container enclosed

Notes:
[1] For industrial/warehouse development, container(s) do not require enclosures, but container(s) must be screened from public view.

3.2.3 Container Enclosure Design Requirements

A. Materials used for container enclosure construction shall be compatible with the architecture and appearance of the main building and may include the following materials:
   1. Concrete Block – Tinted, colored, painted, or with textured facing;
   2. Concrete – Poured or tilt wall construction;
   3. Brick - Double brick thickness minimum;
   4. Stone;
   5. Metal;
   6. Wood;
   7. Vinyl;
   8. Composite Material; or
   9. Any combination of materials 1-8.

B. Front-load and side-load commercial enclosures shall have walls constructed to a minimum height of six (6) feet, or as tall as required to conceal the container. Compactor enclosure walls must be a minimum height of eight (8) feet, in order to conceal the compactor and mechanical equipment.

C. Gates shall be required when the interior of the enclosure is visible from the public ROW or when it is visible from the lot of an adjacent property owner.

D. Personal access side gates are recommended as a feature of all gated enclosures. These gates should be fitted with emergency egress strike bars.

3.2.4 Enclosure Access, Placement, Ingress, and Egress Requirements

A. The required number of enclosures will be determined based on the type and size of the development.

B. Dumpster enclosures must be angled no more than 30 degrees from the center line of the solid waste collection vehicle route.

C. There must be 50 feet or more of unobstructed truck access in front of each container.

D. For safety purposes, solid waste collection vehicles will not back up more than 100 feet after servicing a container and will not make any turns while backing up.

E. Turn Radii Requirements: The turn radii must be a minimum of 30 feet for any intersection to accommodate occasional turning trucks for weekly pick-up.

F. The collection vehicle will travel through a site once without backtracking. For an example of a typical solid waste collection route, take note of the Typical Solid Waste Collection Route Schematic shown in Figure 3.1 below.

G. Container enclosures shall not be located in fire apparatus access roads, public ROW, public utility easements, or sidewalk area.

H. No solid waste container enclosure shall be located within the required front yard or protrude in front of any buildings along the designated lot frontage.

I. Parking spaces shall begin after the enclosure gates open. No obstructions permitted around enclosure or gate openings equivalent to the length of the gate.

J. The location of container enclosures may not cause the obstruction of traffic for excessive lengths of time while being serviced.

K. The solid waste service truck shall be on the property owner's property during service operations, if the site design permits.

L. Ingress and egress routes shall be designed to facilitate exiting the property in a forward driving direction for all interstate and state roads, arterial streets, and collector streets with four lanes. *See* the Backing Clearance Schematic in Figure 3.2 below.

M. Utility wires and structure overhangs should have a minimum height clearance of 20 feet along the ingress and egress route. No utility wires shall extend over the enclosure approach and service area.

N. Container enclosures shall be located a minimum of 30 feet away from any storm drain or drainage flow areas. Where site configuration allows, container enclosures shall also be placed downslope of any storm drain.

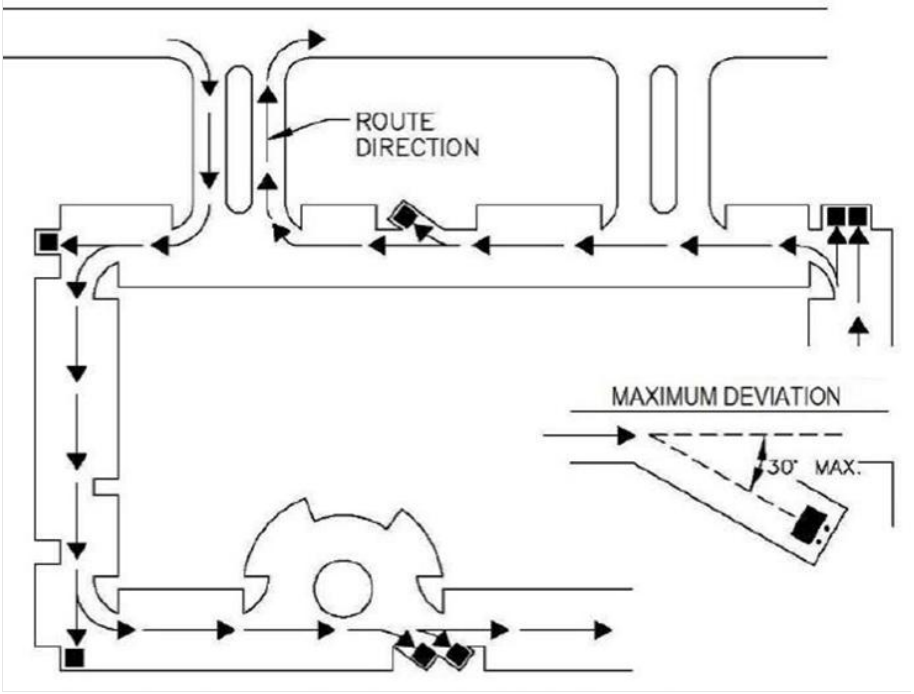


Figure 3.1 Typical Solid Waste Collection Route Schematic

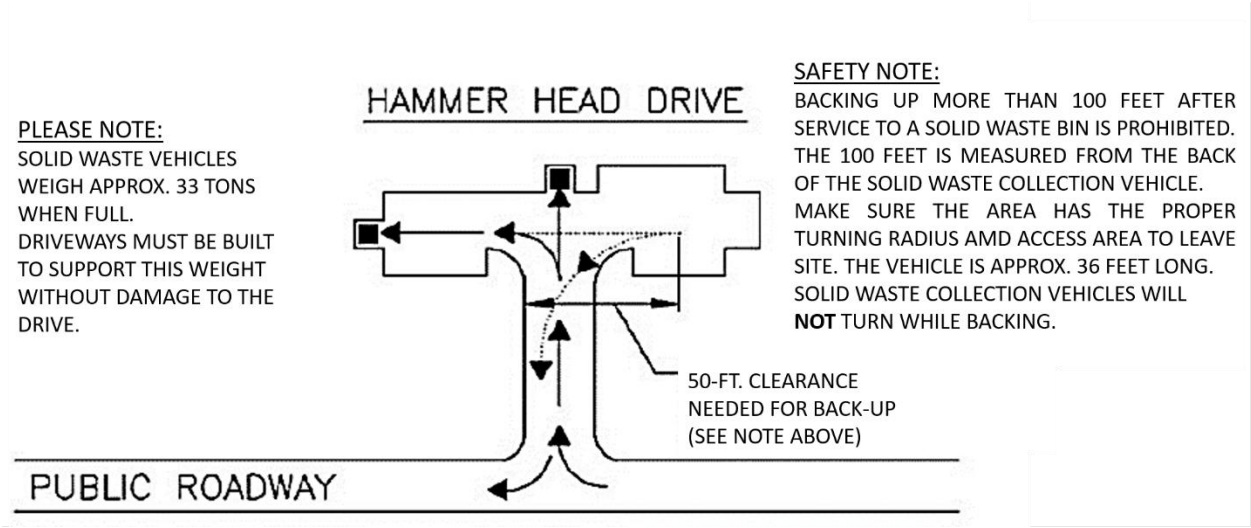


Figure 3.2 Backing Clearance Schematic

3.2.5 Alleyway Access

An alley (residential or commercial) is a private street designed to provide fire and solid waste collection access to the rear or side of a lot. Dead ends are not permitted in alleys. Alleys used for solid waste collection must comply with the Transportation Design Criteria in Section 5 of this Manual. Alleyway access must comply with the following criteria:

A. Design Factors:
   1. Turn Radius;
   2. Street Widths;
   3. Horizontal and Vertical Clearances;
   4. Pavement; and
   5. Multifamily Units

B. Turn Radii Requirements: Texas Department of Transportation (TxDOT) recommends, via AASHTO, that the turn radii be a minimum of 30 feet for alley-to-alley intersections with occasional turning trucks for weekly trash pick-up per TCEQ regulations. Turn radii must be sufficient for side-load residential collection vehicles to navigate alleyways lined with trash and recycle carts on both sides. *See* Figure 3.3 below.

C. Alley Width Requirements: Alleys must be paved and a minimum of 15-ft. wide. Additionally, alleys must be wide enough to accommodate carts, to allow vehicles to safely service carts, and to comply with the Transportation Design Criteria in Section 5 of this Manual.

D. Horizontal and Vertical Clearance Requirements: Balconies, landscaping, or other elements shall not encroach into approved horizontal or vertical clearances for vehicle travel, backing, loading, or other operations along any alley.
   1. The horizontal operating travel clearance must be 20 feet.
   2. The vertical operating travel clearance must be 15 feet.

E. Pavement Requirements: Pavement must be built to standards that allow two (2) 33-ton vehicles to travel down all alleys twice each service day. Alternatively, a responsible party, HOA, or POA must provide a waiver recorded with the property for potential damage caused over time by normal hauler operations.

F. Multifamily Unit Requirements: Any attached residential arrangement of five (5) or more dwelling units per lot will fall under the Commercial Business Category as defined by City of Denton Code of Ordinances 24-2 Definitions (Commercial), which requires a solid waste and recycling storage facility (container enclosure). *See* the Site Plan Criteria for Municipal Solid Waste & Recyclables Storage & Enclosure Requirements in the City of Denton Standard Details.

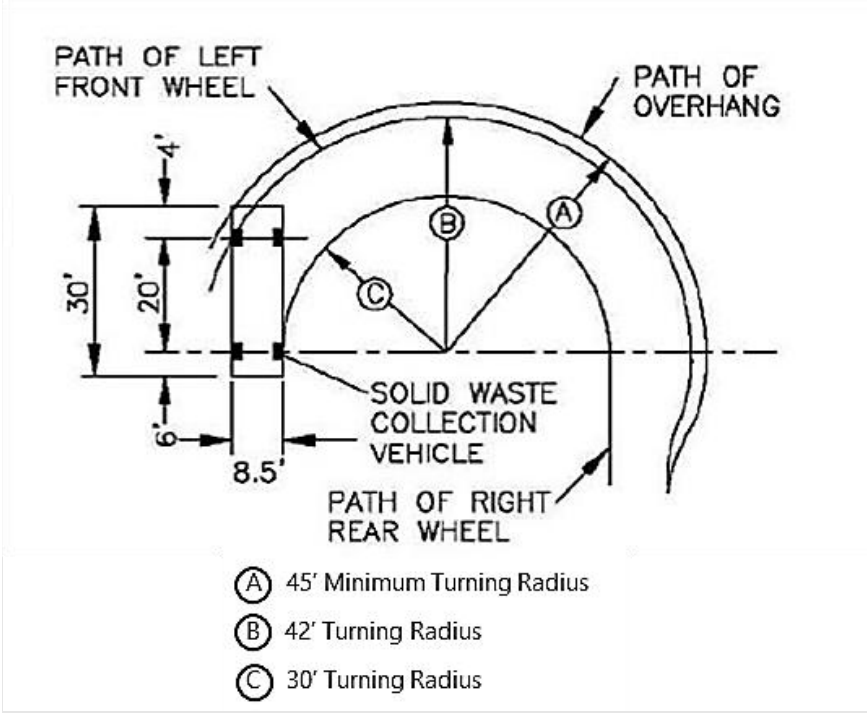


Figure 3.3 Solid Waste Collection Vehicle Turn Radius Schematic

Section 4: Stormwater Design Criteria

4.1 Overview

The purpose of Section 4 - Stormwater Design Criteria of this DCM is to establish standard principles and practices for the design and construction of storm drainage systems, to implement the policies set forth in the DDC and the City of Denton Code of Ordinances, Subpart B, Chapter 30 (Denton Flood Prevention and Protection Ordinance) within the City of Denton, Texas and its extraterritorial jurisdictions.

The following documents govern the design and construction of stormwater drainage systems:

A. City of Denton Code of Ordinances, Chapter 30, Flood Prevention and Protection;

B. DDC Subchapter 7.4 – Environmentally Sensitive Areas;

C. DDC Subchapter 7.5 – Drainage Standards;

D. *i*SWM™ Planning Technical Manual Document;

E. *i*SWM™ Water Quality Technical Manual Document;

F. *i*SWM™ Hydrology Technical Manual Document;

G. *i*swm™ Hydraulics Technical Manual Document;

H. *i*SWM™ Site Development Controls Technical Manual Document;

I. *i*SWM™ Construction Controls Technical Manual Document;

J. *i*SWM™ Construction Control Standard Details Technical Manual Document; and

K. *i*SWM™ Landscape Technical Manual Document.

The design factors, formulae, graphs, and procedures specified in this document are intended for use as minimum engineering criteria for the design of drainage systems with regards to the quantity, rate of flow, method of collection, storage, conveyance, detention, and disposal of storm water***. Responsibility for actual design remains with the design engineer. Users of this Manual should be knowledgeable and experienced in the theory and application of drainage engineering.***

The stormwater criteria contained in this Manual supersede any design criteria contained in the *i*SWM™ Planning, Water Quality, Hydraulics, and Hydrology Technical Manual Documents. The stormwater design criteria contained in this Manual ***do not*** supersede the criteria contained in the DDC or Chapter 30 of the City of Denton Code of Ordinances. Any revisions to the DDC or Chapter 30 of the City of Denton Code of Ordinances shall supersede the criteria in this Manual. In case of any conflict, the more stringent requirement shall apply.

The requirements of this Manual shall apply to all public facilities and to private facilities when the performance of such private facility has an effect on the public interest, health, or welfare.

4.1.0 Organization

Section 4 - Stormwater Design Criteria is categorized as follows:

A. Overview

B. Design Focus

C. Design Storms
D. Hydrologic Methods
E. Acceptable Downstream Conditions for Open Channels and Floodplains
F. Stormwater System Design
G. Culverts
H. Bridges
I. Detention Facilities
J. Energy Dissipation
K. Floodplain
L. Drainage and Floodplain Easements
M. Water Quality
N. Stormwater Facility Maintenance Agreements

4.2 Design Focus

The design criteria for stormwater management primarily focus on:

4.2.1 Streambank Protection - Regulate discharge from the site to minimize downstream bank and channel erosion;

4.2.2 Flood Mitigation and Conveyance - Control runoff within and from the site to minimize flood risk to people and properties for the conveyance storm and the 1% chance storm; and

4.2.3 Water Quality - Reduce pollutants from stormwater by either infiltrating the water quality volume, or removing 80% of total suspended solids (TSS) from any "*Water Quality*" storm event discharge.

4.3 Design Storms

Design is typically based on four (4) storm events, as detailed in Table 4.3-A.

Table 4.3-A: Design Storm Events

Storm Event Name	Storm Event Description
"Water Quality"	Criteria based on a volume of 1.5 inches of rainfall, not storm frequency
"Streambank Protection"	1-year, 24-hour storm event
"Conveyance"	25-year, 24-hour storm event
"Flood Mitigation"	100-year, 24-hour storm event

Notes:
[1] Throughout the manual, the storms will be referred to by their storm event names.

Drainage facilities shall be designed utilizing the "*Flood Mitigation*" storm event. Replacement or modification of existing drainage facilities shall not reduce capacity, but such facility replacements or modifications may be designed according to the requirements of the specific project and may utilize the "*Conveyance*" storm as the design storm event, through an approved design deviation request.

4.4 Hydrologic Methods

4.4.1 Types of Hydrologic Methods

The following empirical hydrologic methods support hydrologic site analysis for the design methods and procedures included in this Manual:

A. Rational Method;

B. SCS Unit Hydrograph Method;

C. Modified Rational Method;

D. Snyder's Unit Hydrograph Method; and

E. USGS & TxDOT Regression Equations

Table 4.4-A lists the hydrologic methods and the circumstances when they may be used in various analysis and design applications. Table 4.4-B provides some additional constraints on the use of several methods.

Table 4.4-A: Applications of the Hydrologic Methods

Method	Rational Method	SCS Method	Modified Rational	Snyder's Unit Hydrograph Method	USGS & TxDOT Equations
Streambank Protection Volume (SP_V)		✓		✓	
Flood Mitigation Discharge (Q_f)		✓		✓	✓
Storage Facilities		✓	✓	✓	
Outlet Structures		✓		✓	
Gutter Flow and Inlets	✓	✓			
Storm Drain Pipes	✓	✓		✓	
Culverts	✓	✓		✓	✓
Bridges		✓		✓	
Small Ditches	✓	✓		✓	
Open Channels	✓	✓		✓	✓

Table 4.4-B: Constraints on Using Hydrologic Methods

Method	Size Limitations [1]	Used for Estimating
Rational [2]	0 – 100 acres	Peak flows and design of small site or subdivision storm sewer systems.
Modified Rational [3]	0 – 200 acres	Runoff volumes for storage design.
Unit Hydrograph (SCS) [4]	Any Size	Peak flows and hydrographs for all design applications.
Unit Hydrograph (Snyder's) [5]	1 acre and larger	Peak flows and hydrographs for all design applications.
TxDOT Regression Equations [6]	10 – 100 sq. mi.	Peak flows for rural design applications.
USGS Regression Equations [6]	3 – 40 sq. mi.	Peak flows for urban design applications.

Notes:
[1] Size limitation refers to the drainage basin for the stormwater management facility (e.g., culvert, inlet).
[2] Acceptable for small, highly impervious drainage areas, such as parking lots and roadways draining into inlets and gutters.
[3] Used for conceptualizing; the engineer of record must use *i*SWM™ Hydrology Technical Manual Document when using this method.
[4] Refers to SCS routing methodology included in many readily-available programs (such as HEC-HMS or HEC-1) which utilize it.
[5] Refers to Snyder's methodology included in many readily-available programs (such as HEC-HMS or HEC-1) which utilize it.
[6] The USGS and TxDOT equations should not be used when there are significant storage areas within the drainage basin or where other drainage characteristics indicate general regression equations are not appropriate.

4.4.2 Rainfall Estimation

Rainfall intensities, provided in Table 5.3 of the iSWM™ Hydrology Technical Manual, are based on Atlas 14 and shall be used for all hydrologic analysis within Denton County.

4.5 Acceptable Downstream Conditions for Open Channels and Floodplains

Storm water discharge from a development shall not cause adverse impacts to adjacent, upstream, or downstream properties or facilities. The design of a storm drain facility must account for the offsite flows that are routed through the development, flows generated by the development, and the impacts of the development and the drainage system on downstream facilities.

4.5.1 Downstream Assessments

The downstream impacts of development must be carefully evaluated for the two (2) focus areas of Streambank Protection and Flood Mitigation (*See* Section 4.2 of this Manual). The purpose of the downstream assessment is to protect downstream properties from increased flooding and downstream channels from increased erosion potential due to upstream development. The importance of the downstream assessment is particularly evident for larger sites or developments that have the potential to dramatically impact downstream areas. The cumulative effect of smaller sites, however, can be just as dramatic and, as such, following the Focus Areas is just as important for the smaller sites as it is for the larger sites.

A downstream assessment will be required for all developments which alter flow patterns or increase the amount of impervious surface and do not limit the peak discharge to pre-development conditions at each outfall from their site. The assessment shall extend from the outfall of a proposed development to a point downstream where there is no calculated increase in WSEL (water surface elevation) or mean velocity within the receiving stream or storm drainage system. The City shall be consulted to obtain records and maps related to the National Flood Insurance Program (NFIP) and the availability of Flood Insurance Studies (FIS)

and Flood Insurance Rate Maps (FIRMs) which will be helpful in this assessment. The assessment must include the following properties:

A. Hydrologic analysis of the pre- and post-development on-site conditions.
B. Drainage path that defines extent of the analysis.
C. Capacity analysis of all existing constraint points along the drainage path, such as existing floodplain developments, underground storm drainage systems culverts, bridges, tributary confluences, or channels.
D. Offsite undeveloped areas are considered as "fully developed" for both the pre- and post-development analyses.
E. Evaluation of peak discharges and velocities for three (3) 24-hour storm events:
    1. "*Streambank protection*" storm
    2. "*Conveyance*" storm
    3. "*Flood Mitigation*" storm
F. Separate analysis for each major outfall from the proposed development.

Once the analysis is complete, the designer must answer the following questions at each determined junction downstream:

A. Are the post-development discharges greater than the pre-development discharges?
B. Are the post-development velocities greater than the pre-development velocities?
C. Are the post-development velocities greater than the velocities allowed for the receiving system?
D. Are there any increases in post-development flood heights above the pre-development flood heights?

These questions shall be answered for each of the three (3) storm events. The answers to these questions will determine the necessity, type, and size of non-structural and structural controls to be placed on-site or downstream of the proposed development.

Section 2.0 of the iSWM™ Hydrology Technical Manual, as amended, gives additional guidance on calculating the discharges and velocities, as well as determining the downstream extent of the assessment.

4.5.2 Adverse Impacts

Downstream Assessments shall evaluate the capacity of the downstream system within the Zone of Influence (ZOI). If the downstream system has less than fully developed capacity, the study shall demonstrate the development will produce no adverse impacts during the one (1), 25, and 100-year storm events. No adverse impacts may include, but are not limited to:

A. No new or increased flooding of existing structures;

B. Zero increases (0.00') in water surface elevations unless contained within the banks of an existing channel including 1-ft. freeboard. Dry lane requirements set forth in Section 4.6.2 shall also be met;

C. Increasing channel velocity is prohibited where existing velocities are erosive. Any increase in channel velocity in other areas must remain below the maximum allowable velocity as defined in Table 4.6-E;

D. No increases in downstream discharges caused by the proposed development that, in combination with off-site discharges, exceeds the existing capacity of the downstream storm drainage system;

E. The *Downstream Assessment* shall extend to a point downstream, known as the ZOI, where the proposed development creates no adverse impacts. The ZOI will be defined by a detailed hydrologic and hydraulic modeling analysis. The City's Engineer may require analysis beyond the ZOI

established by the Engineer of Record based on the criteria above and known flooding issues. ZOI does not automatically end based the rule of thumb known as the "10% rule"; and

F. If the subject development is part of a larger development, the *Downstream Assessment* must include the larger development, and the ZOI shall be determined based on the entire property.

4.5.3 Stormwater Diversions

Diversion of storm water away from the natural watercourse or existing discharge points will not be allowed, except within the property boundaries controlled by the developer under the following conditions:

A. The storm water is returned to its natural flowing watercourse prior to leaving the developer's property, or

B. A timing analysis of the existing and diverted hydrograph must be performed to confirm that the peak flow rate has not been increased at the point that it reenters the watercourse, as a result of the diversion. The City's Engineer may require additional downstream analysis if there are known downstream flooding or volume-sensitive areas.

4.5.4 Streambank Protection

There are two (2) options by which a developer can provide adequate streambank protection downstream of a proposed development. The first step is to perform the required downstream assessment as described earlier in Section 4.5.1 of this Manual. If it is determined that the proposed project does not exceed acceptable downstream velocities or the downstream conditions are improved to adequately handle the increased velocity, then no additional streambank protection is required. If the downstream assessment shows that the velocities are within acceptable limits, then no streambank protection is required. Acceptable limits for velocity control are provided in Table 4.6-D and Table 4.6-E of this Manual. If existing stream velocities exceed the maximum allowable velocities, then no increase in velocities will be permitted. If the downstream assessment shows an increase in velocity beyond the acceptable limits, then on-site or downstream improvements are required for streambank protection, easements or right-of-entry agreements will need to be obtained in accordance with Section 4.12 of this Manual, and one of the two options below must be utilized for streambank protection.

Option 1: Reinforce/Stabilize Downstream Conditions

If the increased velocities are greater than the allowable velocity of the downstream receiving system, then the developer must reinforce/stabilize the downstream conveyance system. The proposed modifications must be designed so that the downstream system is protected from the post-development velocities. The developer must provide supporting calculations and/or documentation that the downstream velocities do not exceed the allowable range once the downstream modifications are installed.

Allowable bank protection methods include stone riprap, gabions, and bio-engineered methods. Sections 3.2 and 4.0 of the *i*SWM™ Hydraulics Technical Manual give design guidance for designing stone riprap for open channels, culvert outfall protection, riprap aprons for erosion protection at outfalls, and riprap basins for energy dissipation.

If the downstream receiving system is designated as an Environmentally Sensitive Area (ESA) this option may not be a viable option. *See* Section 7.4 of the DDC for more information about the various types of ESAs, permitted encroachments, and processes for assessing and modifying ESAs.

Option 2: Install Stormwater Controls to Maintain Existing Downstream Conditions

The developer must use on-site controls to keep downstream post-development discharges at or below

allowable velocity limits. The developer must provide supporting calculations and/or documentation that the on-site controls will be designed such that downstream velocities for the three (3) storm events ("*Streambank Protection", "Conveyance",* and *"Flood Mitigation"*) are within an allowable range once the controls are installed.

4.5.5 Flood Mitigation

A. Introduction

Flood analysis is based on the *"Flood Mitigation"* storm event (see Table 4.3-A). The intent of the flood mitigation criteria is to provide for public safety; minimize on-site and downstream flood impacts from the *"Flood Mitigation"* storm event; maintain the boundaries of the mapped 100-year floodplain; and protect the physical integrity of the on-site stormwater controls and the downstream stormwater and flood mitigation facilities.

Flood mitigation must be provided for on-site conveyance systems, as well as downstream outfalls as described in the following sections.

B. Flood Mitigation Design Options

There are three (3) options by which a developer may address downstream flood mitigation as discussed below. When on-site or downstream modifications are required for downstream flood mitigation, easements or right-of-entry agreements will need to be obtained.

The developer will provide all supporting calculations and/or documentation to show that the existing downstream conveyance system has capacity (Q_f) to safely pass the fully-developed flood mitigation storm discharge.

Option 1: Provide or Document Adequate Downstream Conveyance Systems

When the downstream receiving system does not have adequate capacity, then the developer shall provide modifications to the off-site, downstream conveyance system. If this option is chosen, the proposed modifications must be designed to adequately convey the full build-out stormwater peak discharges for the *"Flood Mitigation*" storm event. The modifications must also extend to the point at which the discharge from the proposed development no longer has an impact on the receiving stream or storm drainage system.

The developer must provide supporting calculations and/or documentation that the downstream peak discharges are safely conveyed by the proposed system, without endangering downstream properties, structures, bridges, roadways, or other facilities, and no increase in water surface elevation.

Option 2: Install Stormwater Controls to Maintain Existing Downstream Conditions

When the downstream receiving system does not have adequate capacity, then the developer shall provide stormwater controls to reduce downstream flood impacts. These controls include on-site controls such as detention, regional controls, and, as a last resort, local flood protection such as levees, floodwalls, floodproofing, etc.

The developer must provide supporting calculations and/or documentation for each existing discharge point indicating that the controls will be designed and constructed so that there is no increase in downstream peak discharges or water surface elevations due to development.

Option 3: In lieu of a Downstream Assessment, Maintain Existing On-Site Runoff Conditions

Lastly with Option 3, on-site controls shall be used to maintain the pre-development peak discharges for each existing discharge point from the site. The developer must provide

supporting calculations and/or documentation that the on-site controls will be designed and constructed to maintain on-site existing conditions.

It is important to note that Option 3 may not require a downstream assessment. It is a detention-based approach to addressing downstream flood mitigation after the application of the integrated site design practices. However, a downstream assessment may be required for sites adjacent to or near streams in which delayed release of flows from detention facilities could potentially increase the peak flow in the stream due to coincident peaks. This assessment of the impact of coincident peaks is required for all sites with a contributing drainage area greater than or equal to 10% of the stream drainage area at the subject discharge point.

4.6 Stormwater System Design

4.6.1 Introduction

Stormwater system design is an integral component of both site and overall stormwater management design. Good drainage design must strive to maintain compatibility and minimize interference with existing drainage patterns; control flooding of property, structures, and roadways for design flood events; and minimize the potential environmental impacts of stormwater runoff.

Stormwater collection systems must be designed to provide adequate surface drainage while at the same time meeting other stormwater management goals such as water quality, streambank protection, habitat protection, and flood mitigation. Fully developed watershed conditions shall be used for determining runoff for the *"Flood Mitigation"* storm event.

4.6.2 Hydraulic Design Criteria for Streets and Closed Conduits

A. Introduction

This section is intended to provide criteria and guidance for the design of on-site flood mitigation system components including:

1. Street and roadway gutters;
2. Stormwater inlets;
3. Storm drainpipe systems; and
4. Parking lot sheet flow.

B. Streets and ROW

1. Design Criteria
    a. Flow spread limits for curbed streets are shown in Table 4.6-A below.
    b. Inverted crown sections are permitted only in alleys.
    c. Street crowns shall be reduced for approximately 100 feet on each side of the valley gutters. No valley gutters will be permitted across collectors or arterials.
    d. For non-curbed streets the "*Flood Mitigation*" storm event shall be contained within paralleling roadside ditches, within the public ROW (Figure 4. 1 below).
    e. Roadside ditches shall be designed to carry the "*Flood Mitigation*" runoff below the roadway elevation.

f. Streets or alleys adjacent to an open channel shall have the edge of the pavement designed with a minimum elevation of one (1) foot above the "*Flood Mitigation*" elevation or as directed by the City's Engineer.

g. Where additional hydraulic capacity is required on the street, the proposed street gradient must be increased, or curb inlets and storm sewers installed to remove a portion of the flow.

h. The maximum concentrated flow directed into the street (from a driveway or flume, etc.) is three (3) cubic feet per second (cfs).

2. Flow Spread Limits

a. Inlets shall be spaced so that the spread of flow in the street for the *"Flood Mitigation"* storm shall not exceed the guidelines listed below in Table 4.6-A, as measured from the gutter or face of the curb:

Table 4.6-A: Flow Spread Limits

Street Classification	Allowable Encroachment
Collectors	one travel lane remains open
Arterials	one travel lane in each direction remains open
Residential Streets	curb depth

b. The allowable drainage flow across street intersections for the *"Flood Mitigation"* storm event shall be as shown in Table 4.6-B as follows:

Table 4.6-B: Permissible Flow Across Street Intersections

Street Classification	Cross-Flow
Arterial Street (divided and undivided)	None
Non-Residential Collector Street	None
Residential Street and Residential Collector	Gutter Flow of 2 inches or less

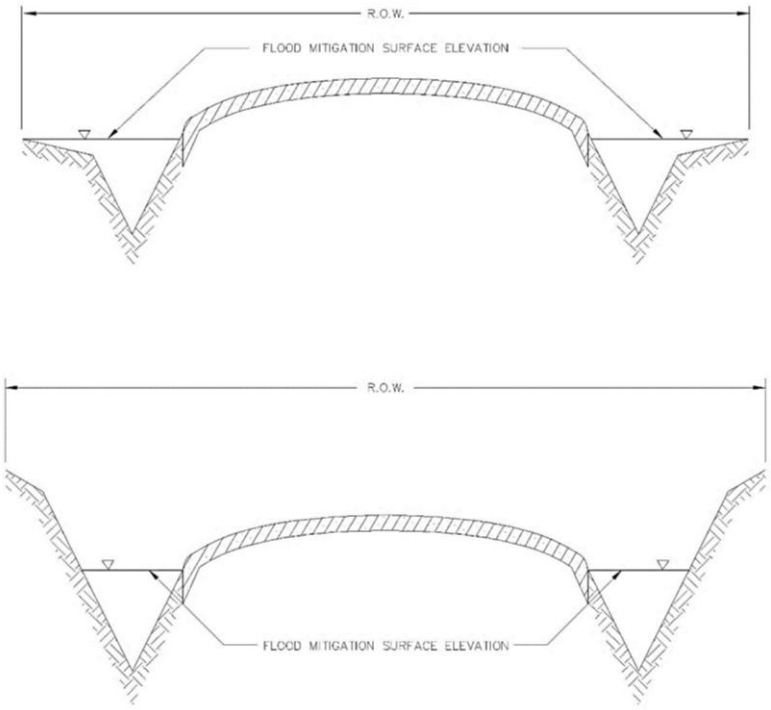


Figure 4.1 Water Spread Limits for Non-Curbed Roadways

3. Minimum Street or Alley Elevations

   No lowering of the standard height of street crown shall be allowed for the purposes of obtaining additional hydraulic capacity. Street crowns shall be in accordance with the City of Denton Standard Details.

C. Drainage Related Minimum Elevations

1. For lots in the influence of a sag area and a positive overflow, the finished floor elevation (FFE) will be at least one (1) foot above the sag area top of the curb, or one (1) foot above the possible maximum pool elevation when the positive overflow is functioning, whichever elevation is higher.
2. New and substantially improved structures within the floodplain or within 200 feet of the floodplain or SFHA must have their finished floor elevated to the minimum building elevation as defined in the City's Chapter 30 Flood Prevention and Protection Ordinance.
3. In all other areas, the minimum FFE shall be a minimum of one (1) foot above the street curb, edge of alley, or rear property line (at the midpoint of the lot), whichever is lower.

D. Storm Inlet Design

1. Permissible Types of Inlet
   a. Drop Inlets (Y-inlet) – Drop inlets are sump inlets which are not located along the curb line of a roadway.
   b. Grate Inlets – The use of grate inlets is not allowed on public drainage systems unless through an approved design deviation request. If allowed, the inlet opening shall be designed twice as large as the calculated opening to compensate for clogging. Grate

inlets may be used on private systems.

c. Curb Inlets – Curb inlets may be located at roadway low points (sumps) or on grade at such points as to meet the water spread limitations and cross-flow depth requirements. Curb inlets may be one of the following:

   i. Recessed curb inlet – Recessed curb inlets are curb inlets constructed such that the front of the inlet is two (2) feet behind the normal face of curb and the depression does not extend into the traffic lanes.

   ii. Standard curb inlet – Standard curb inlets are curb inlets that are in line with the roadway curb.

   iii. Type 2 curb inlet – Type 2 curb inlets are standard curb inlets where the inlet box is located underneath the outer roadway lane instead of behind the curb. They are only to be utilized in situations where there is insufficient parkway area or an encumbered parkway area for a standard curb inlet.

2. Design Criteria

   a. Public curb inlet size shall be 10, 15, or 20 feet. Maximum length of inlet at any one (1) curb location shall be 20 feet on each side of the street. Inlets will be placed only in straight sections of curb and at least 5 feet from any curb return. Inlets required in cul-de-sacs are the only exceptions to the straight curb section requirement. Curb inlets are not allowed in intersection or curb returns.

   b. Recessed inlets will be required on arterial and non-residential collector streets.

   c. The maximum inlet opening shall be six (6) inches. Openings larger than six (6) inches shall require approval through a design deviation request and shall contain a bar or other form of restraint.

   d. Inlets shall be located in the following locations:

      i. At low points;

      ii. Upstream of pavement crown transitions at intersections (or the developer may identify flow patterns and depths to show these inlets are not needed); and

      iii. Where street flow spread limits or permissible intersection depths are exceeded.

   e. Where possible, inlets at intersections shall be located on the street with the lesser classification or on alleys.

   f. A bypass of no more than 10% of the inlet capacity will be allowed for the *"Flood Mitigation"* storm event.

   g. To prevent water flowing across the street for the "*Flood Mitigation*" storm event, water flowing in gutters of arterials should be picked up prior to reaching super-elevated sections.

   h. In super-elevated sections of divided arterials, inlets placed against the center medians shall have no gutter depressions. Interior gutter flow (flow along the median) shall be intercepted at the point of superelevation transition to prevent street cross-flow.

   i. At bridges with curbed approaches, water should be intercepted before flowing onto the bridge to prevent icing during cold weather.

   j. New inlets shall not be constructed within a sidewalk or other pedestrian path.

k. The use of recessed inlets shall only be allowed where they do not adversely impact the access or functionality of existing utility facilities.

l. Design and location of inlets shall take into consideration pedestrian and bicycle traffic.

m. The use of slotted drains is discouraged except in instances where there is no alternative. Any use of slotted drains requires approval through a design deviation request. If used, the manufacturer's design guidelines should be followed.

n. Depressed inlets are recommended on continuous grades that exceed 1%, although their use in traffic lanes should be avoided whenever possible.

o. A redundant, flanking inlet is required wherever a sag point or low point inlet is identified, and no positive overflow path is provided. The redundant inlet shall have the same size as the sag or low point inlet but will not be considered in the hydraulic capacity calculations. The redundant inlet shall have a maximum inlet elevation of six (6) inches above the sag or low point inlet elevation to ensure ponding does not overtop the curb.

3. Inlet Computations

a. Sump Inlets and Drop Inlets

Curb inlets and drop inlets in a sump or low point can be considered to function as a rectangular broad-crested weir with a coefficient of discharge of 3.06. The capacity shall be based on the following weir equation:

$$\mathbf{Q / L \text{ or } Q / P = 3.06\ H^{3/2}} \qquad \textbf{[Eqn. 4.1]}$$

Where:
Q = Capacity of curb opening inlet or capacity of drop inlet (*cfs*)
H = Head at the inlet (*feet*)
L = Length of curb opening inlet (*feet*); or
P = Length of portion of perimeter of inlet opening, through which water enters the drop inlet (*feet*)

Inlets should be located such that the inlet openings do not become submerged. In some cases where this is not possible and the inlet operates under completely submerged conditions, the orifice equation [Eqn. 4.2] should be used to compute the inlet capacity, rather than the weir formula [Eqn. 4.1]. The capacity of a completely submerged inlet shall be based on the following orifice equation:

$$\mathbf{Q = 4.84\ A\ H^{1/2}} \qquad \textbf{[Eqn. 4.2]}$$

Where:
A = Area of inlet opening

The curves shown in Figure 4.2 and Figure 4.3 provide for direct solution of the above equations.

In order to facilitate the computations required in determining the various hydraulic properties for curb inlets and drop inlets in sump conditions, Figure 4.4 Computation Sheet has been prepared.

Column 1 Inlet number and designation.
Column 2 Total flow in *cfs* to inlet. For inlets other than the first inlet in a system, flow is the sum of runoff from the contributing area plus carry-over flow from inlet or inlets upstream.

Column 3 Assumed length of inlet opening or perimeter in feet.

Column 4 Total area of inlet opening based on assumed inlet opening length and opening height.

Column 5 Discharge per unit foot of inlet opening. Column 2 divided by Column 3.

Column 6 Computed head at inlet for weir flow conditions based on Figures 4.2 or 4.3 or the following equation:

$$H = (q / 3)^{2/3} \quad \textbf{[Eqn. 4.3]}$$

Column 7 Computed head at inlet for orifice flow conditions (submerged inlet) based on Figures 4.2 or 4.3 or the following equation:

$$H = [(Q / A) / 4.82]^2 \quad \textbf{[Eqn. 4.4]}$$

Column 8 Maximum allowable head at sump inlet. This value is determined from topographic conditions at the sump inlet site.

Column 9 Width of spread of water for curb inlets in sump.

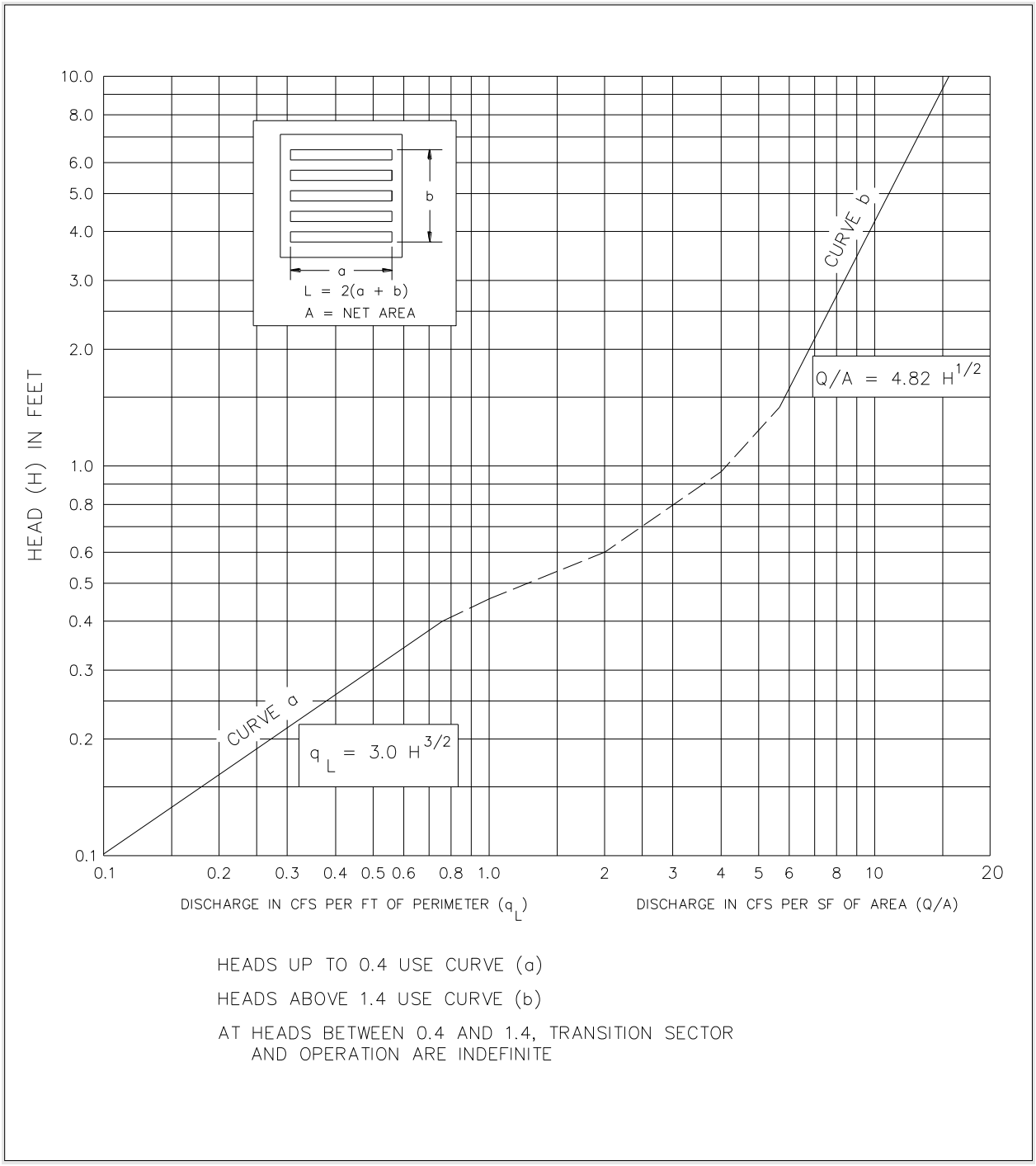


Figure 4.2 Capacity of Grate Inlet in Sump

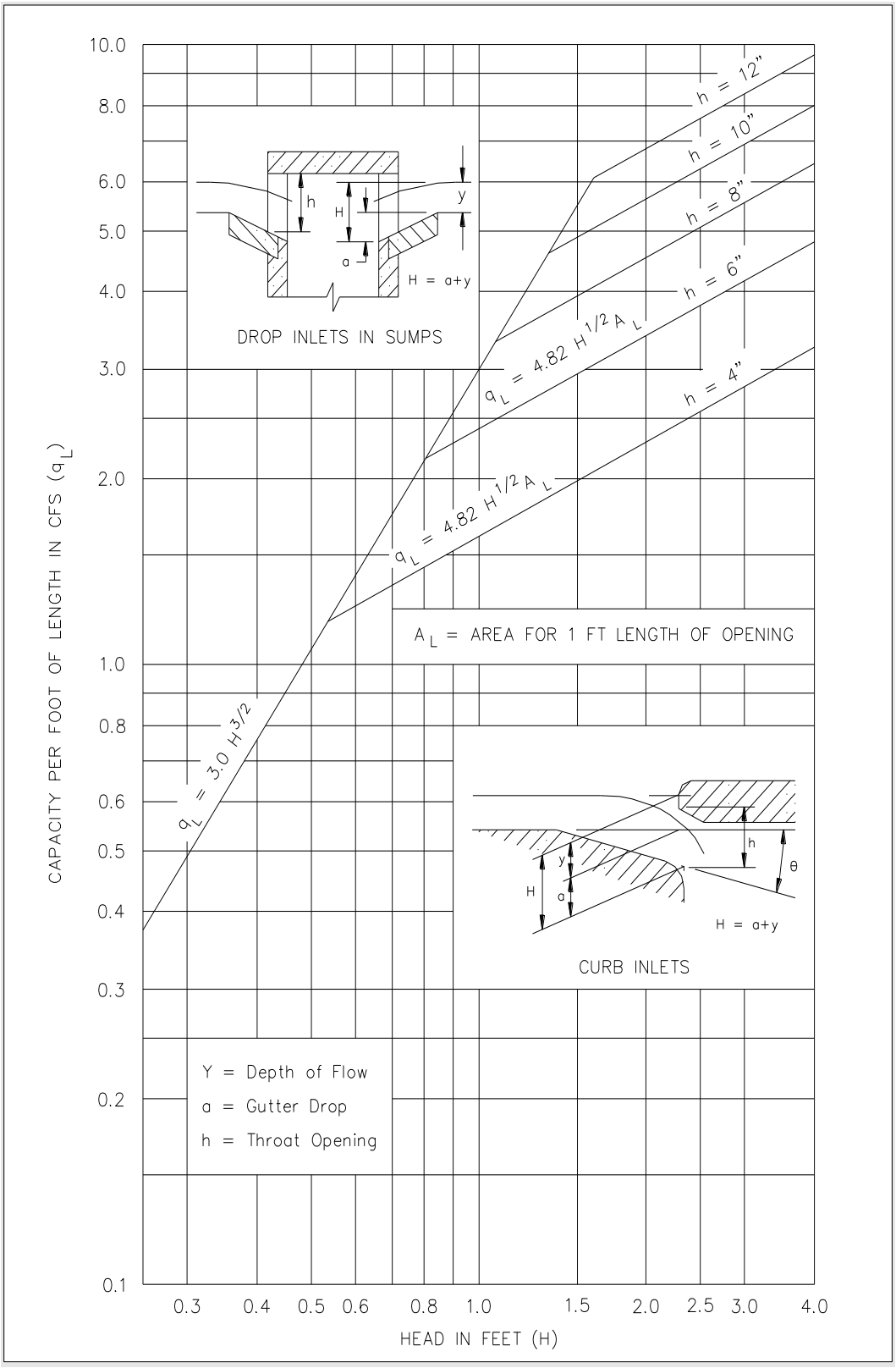
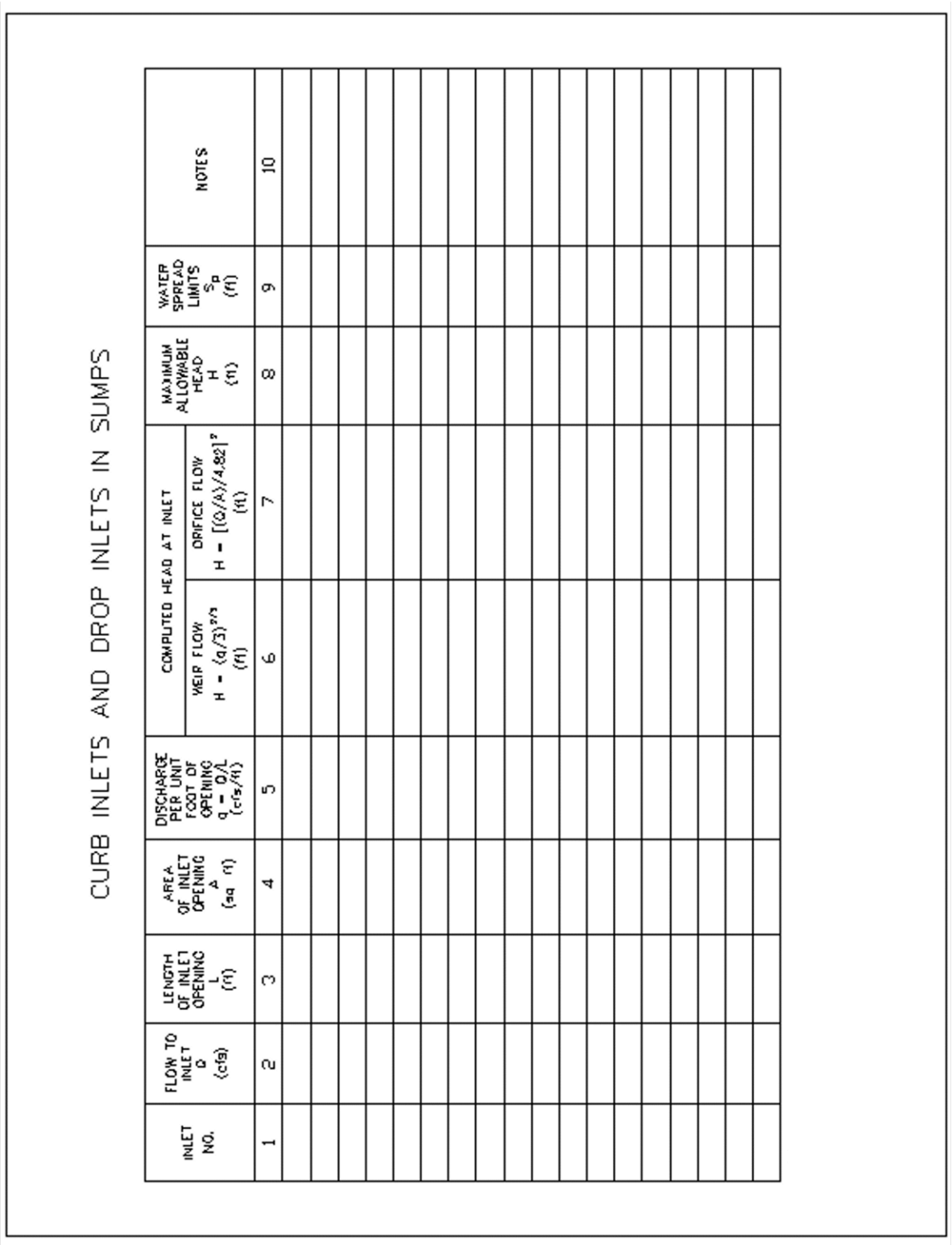


Figure 4.3 Capacity of Drop Inlets and Curb Inlets in Sumps



CURB INLETS AND DROP INLETS IN SUMPS

INLET NO.	FLOW TO INLET Q (cfs)	LENGTH OF INLET OPENING L (ft)	AREA OF INLET OPENING A (sq ft)	DISCHARGE PER UNIT FOOT OF OPENING q = Q/L (cfs/ft)	COMPUTED HEAD AT INLET		MAXIMUM ALLOWABLE HEAD H (ft)	WATER SPREAD LIMITS S_p (ft)	NOTES
					WEIR FLOW $H = (q/3)^{2/3}$ (ft)	ORIFICE FLOW $H = [(Q/A)/4.82]^2$ (ft)			
1	2	3	4	5	6	7	8	9	10

Figure 4.4 Computation Sheet for Curb Inlets and Drop Inlets in Sumps

b. Inlets on Grade

The capacity of a curb inlet on grade will be based on the following equation:

$$Q / L_o = 0.7 [1 / y_o] [(H)^{5/2} - (a)^{5/2}] \quad \textbf{[Eqn. 4.5]}$$

Where:
Q = Discharge into inlet (cfs)
L_o = Length of inlet opening (feet)
a = Gutter depression (feet)
y_o = Depth of flow in approach gutter (feet)
$H = a + y_o$

The curve shown in Figure 4.6 provides for the direct solution of the above equation when the value of y_o is known. The curve shown in Figure 4.7 provides for the determination of the ratio of the intercepted flow by the inlet to the total flow in the gutter.

In order to facilitate the computations required in determining the various hydraulic properties for curb inlets on grade, Figure 4.5 shows Computation Sheet prepared.

Column 1 Inlet Type and number.
Column 2 Location of inlet by station number.
Column 3 Drainage Area designation of area entering between the previous pick up point and the inlet being designed.
Column 4 Peak Discharge (Q_p) from area of Column 3.
Column 5 Carry-over flow (q) which has been passed by the last preceding inlet to the inlet under consideration.
Column 6 Total gutter flow (Q_o) in cfs. For inlets other than the first inlet in the system, total gutter flow is the sum of the runoff from the contributing area plus carry-over flow from the inlet or inlets upstream. Column 4 plus Column 5.
Column 7 Reciprocal of the pavement cross slope for pavements with straight crown slopes.
Column 8 Reciprocal of the pavement cross slope (Z) divided by the pavement roughness coefficient (n).
Column 9 Slope of approach gutter (S_o) in feet per feet.
Column 10 Depth of gutter flow "y_o" in approach gutter direct from Manning's equation for triangular gutters:

$$y_o = 1.245 (Q^{3/8})[n^{3/8}/ S^{3/16}] [1 / Z]^{3/8} \quad \textbf{[Eqn. 4.6]}$$

Column 11 Spread of water (S_p) or width of ponding in the gutter measured from the face of curb. Column 7 times Column 10.
Column 12 Width of street and height of parabolic crown.
Column 13 Slope of approach gutter (S_o) in feet per feet.
Column 14 Depth of gutter flow " y_o " in approach gutter. Column 15 Spread of water (S_p) or width of ponding in the gutter measured from face of curb.
Column 16 Discharge (Q) in cfs which will be intercepted by an inlet one (1) foot in length for a given depth of flow in the approach gutter (y_o).

Determined from Figure 4.6 or from the solution of the following equation:

$$Q / L_o = 0.7 [1 / y_o] [(H)^{5/2} - (a)^{5/2}] \quad \textbf{[Eqn. 4.7]}$$

Column 17 Length of inlet (L_o) in feet which is necessary to intercept a given discharge Q_o. Column 6 divided by Column 16.

Column 18 Actual length (L) in feet of inlet which is to be provided.

Column 19 Ratio of the length of inlet provided (L), to the length of the inlet required for 100% interception (L_o). Column 18 divided by Column 17.

Column 20 Percentage of discharge intercepted by the inlet in question determined from Figure 4.7 using the values determined in Column 19 and Column 10 or Column 14.

Column 21 Discharge (Q) in cfs which the inlet in question actually intercepts. Column 6 times Column 20.

Column 22 Carry-over flow (q) is the amount of water which passes any inlet, and is the difference between the total flow (Q_o) of Column 6 and the intercepted flow (Q) of Column 21.

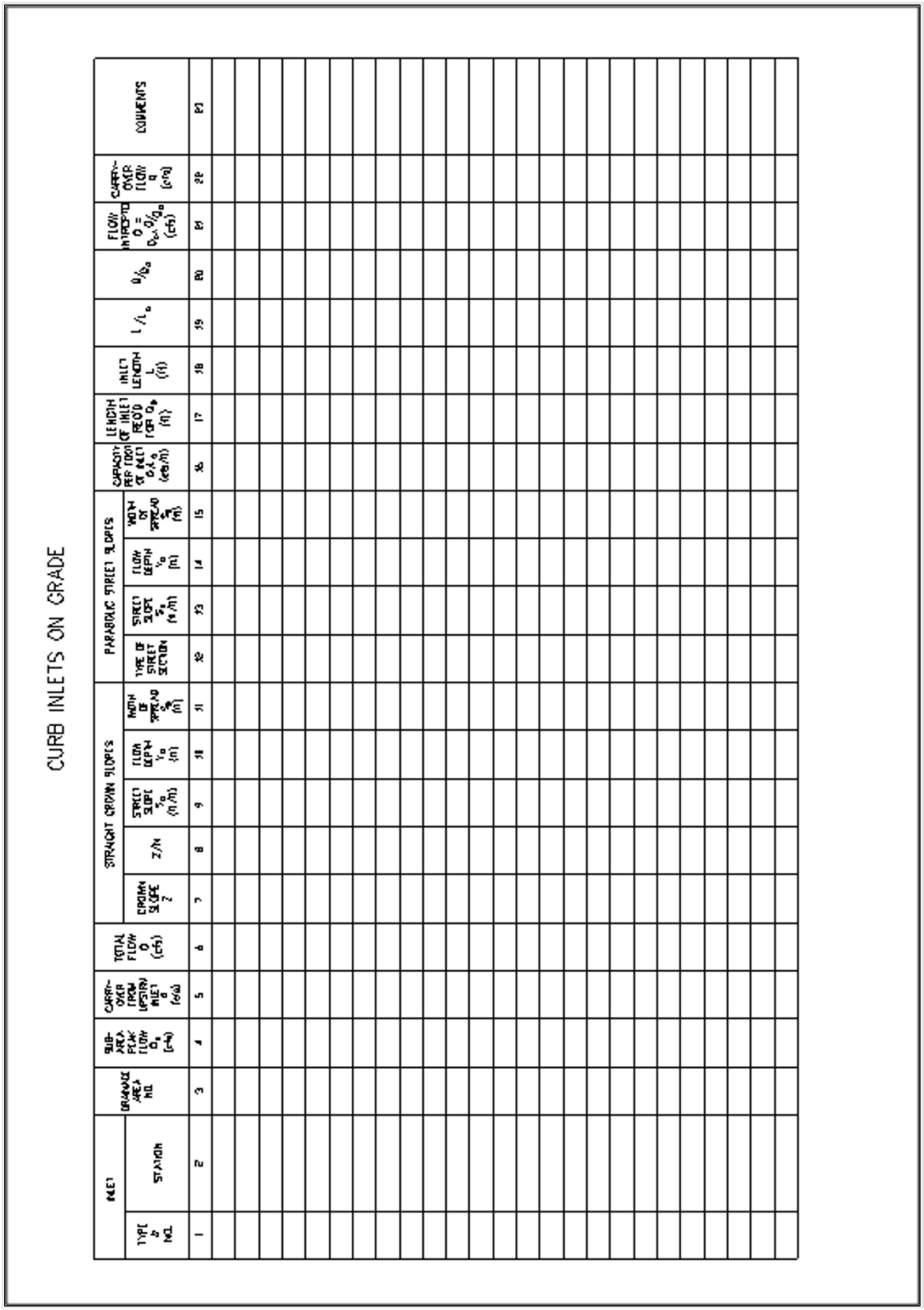


Figure 4.5 Computation Sheet for Curb Inlets On Grade

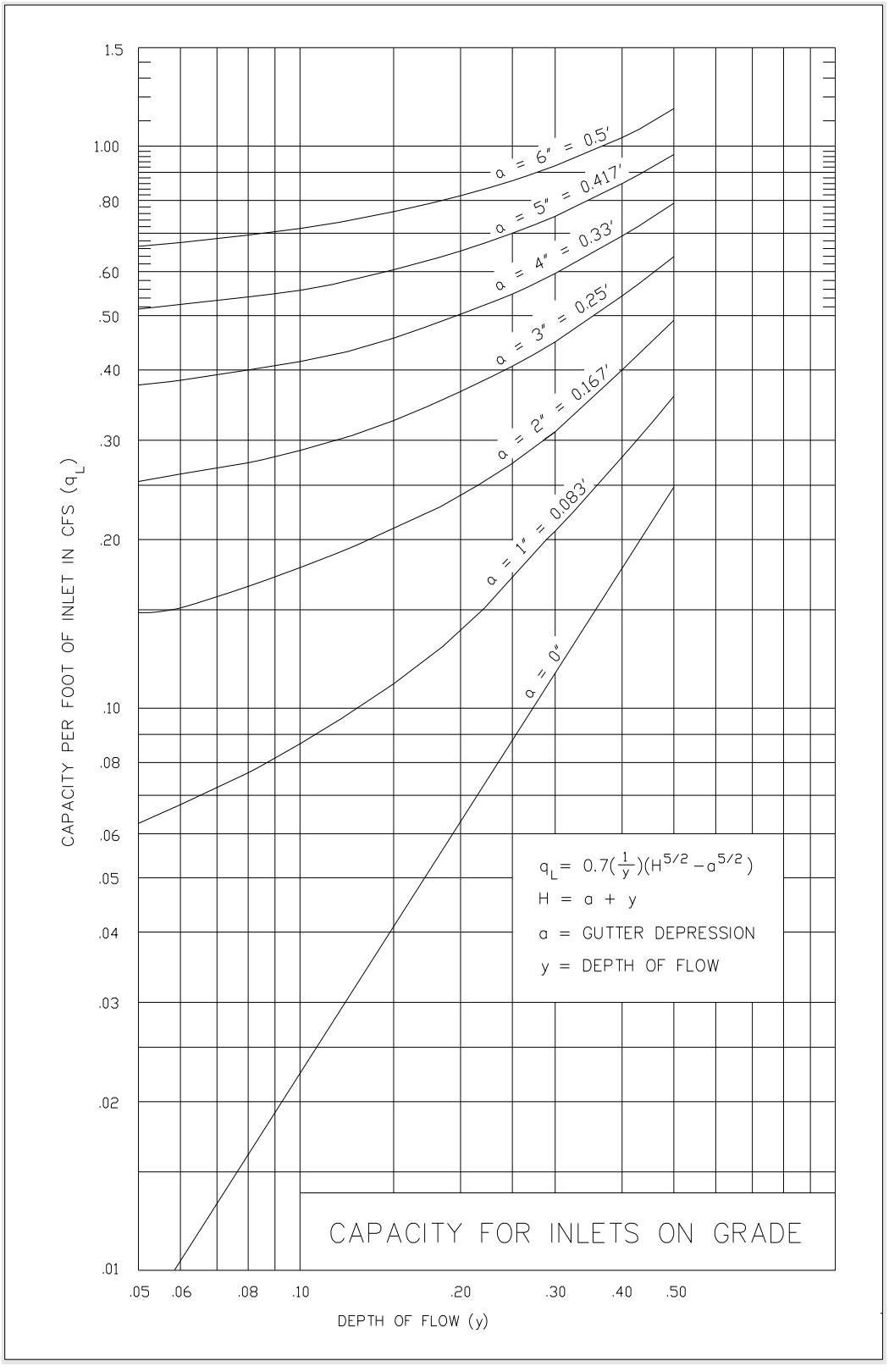


Figure 4.6 Capacity for Inlets On Grade

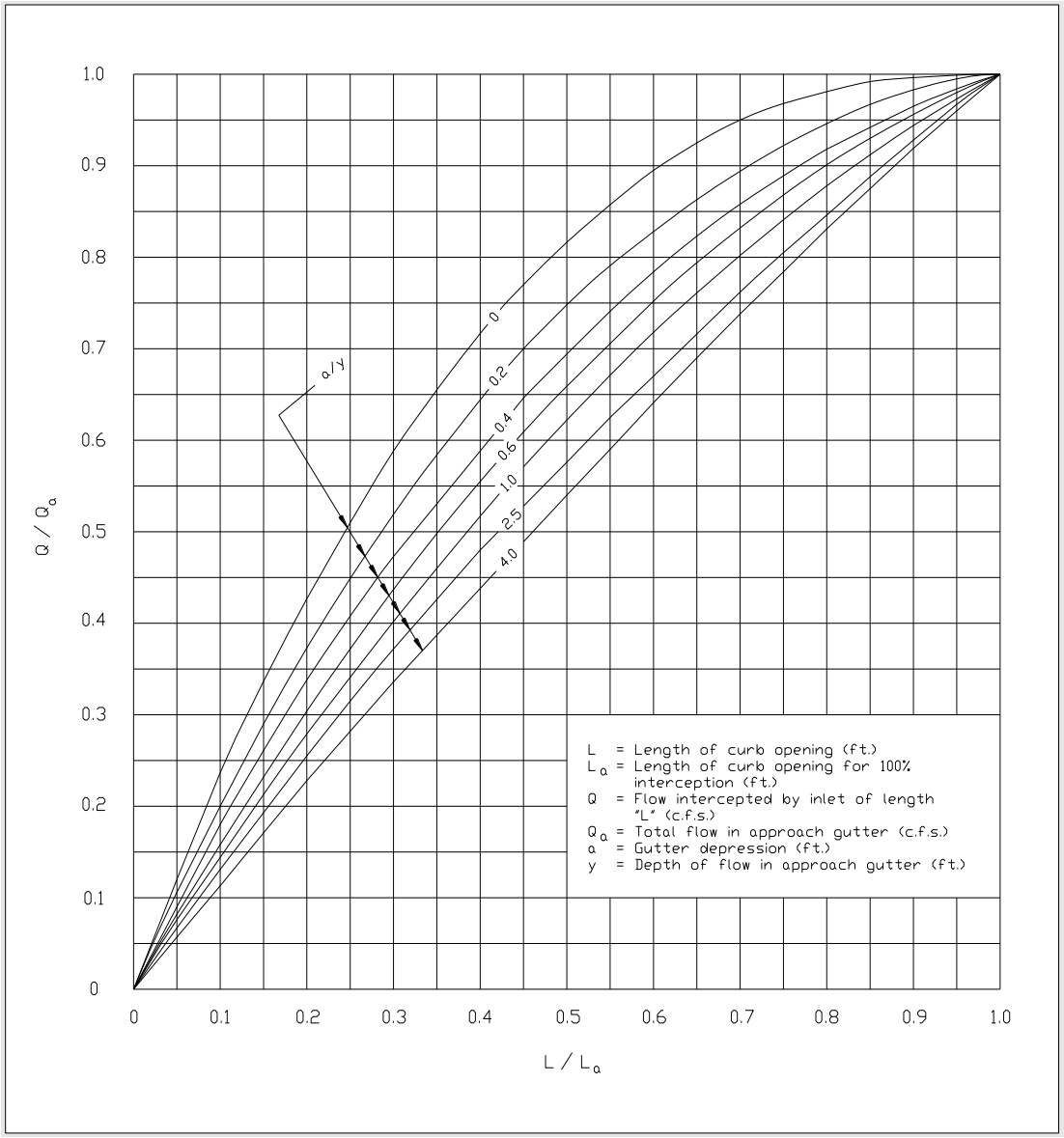


Figure 4.7 Ratio of Intercepted Flow to Total Flow for Inlet On Grade

E. Storm Drain Pipe Design

1. Design Frequency

   Pipe Design: *"Flood Mitigation"* storm event.

2. Design Criteria

   a. Storm drain systems capable of conveying the *"Flood Mitigation"* storm event are required when water spread, intersection cross-flow, and lot-to-lot drainage flow limits are exceeded, or when the minimum time of concentration shown in *Table 1.5 of the iSWM™ Hydrology Technical Manual Document* are reached. Closed pipe systems are required for discharges up to and including 300 cfs in public systems.

   b. Pipe material in a public storm drain system or in public ROW shall be reinforced concrete for all pipe sizes, or Polypropylene for sizes up to 60 inches, with appropriate bedding and class type depending on cover.

   c. Proposed storm drains may discharge into existing watercourses. *See Section 1.2.10 of the iSWM™ Hydraulics Technical Manual Document* for guidance related to the Tailwater elevation to be used for hydraulic grade line calculations.

   d. The maximum hydraulic gradient shall not produce a velocity that exceeds 15 fps. Table 4.6-C shows the desirable velocities for most storm drainage design. Storm drains shall be designed to have a minimum mean velocity flowing full at 2.5 fps.

Table 4.6-C: Desirable Velocity in Storm Drains

Description	Max. Desirable Velocity (fps)
Culverts (All types)	15
Inlet laterals	No Limit
Collectors (≤ 24 inches)	15
Mains (> 24 inches)	12

   e. The minimum desirable physical slope shall be 0.5% or the slope that will produce a velocity of 2.5 fps as required for the *"Streambank Protection"* storm event when the culvert is flowing partially full, whichever is greater.

   f. The potential hydraulic grade line elevation shall not exceed ground elevation or the gutter flow line, whichever is lowest.

   g. Access junction boxes are required along straight runs of closed conduits, with a maximum spacing of 500 feet for all pipe and box sizes.

   h. A minimum of 24 inches of vertical separation shall be maintained between storm sewer conduits and any other utility. If it is not possible to provide 24 inches of vertical separation, the design must be approved through a Design Deviation Request and shall not provide separation less than 6 inches and must provide a concrete cap between the crossing utility line.

   i. Junction Boxes shall also be located at:

      i. any point where three (3) or more drainage conduits (laterals or trunk lines) come together;

      ii. any point where a trunk line size changes;

      iii. grade changes;

iv. the upstream end of the storm drain system;

v. Bends greater than 45 degrees;

vi. Pipe junctions greater than 45 degrees; and

vii. At the connection point between public and private storm sewer pipes or boxes. If this connection point is in the public ROW, pipe materials on the private system must meet public storm drain system materials requirements. If the connection point is on private property, then the public portion of the system must be contained in an easement.

j. Inlets will not be allowed to serve as a junction box, except through an approved design deviation request. Where inlets are permitted to serve as a junction box, the width of the inlet, at a minimum, shall be doubled in size. Storm drain systems parallel to the street will not be permitted to run directly through inlets.

k. Bends without junction boxes shall be limited to 45 degrees or less.

l. The minimum storm drain pipe diameter shall be 18 inches.

m. Pipe diameters shall not decrease downstream.

n. Laterals shall be connected to trunk lines using a junction box or manufactured wye connections. Cut-in or punch-in connections to pipes are prohibited.

o. All cut-in or punch-in connections to precast inlets, junction boxes, box culverts, etc. will require a concrete collar to be poured around the connection.

p. Vertical or horizontal curves/deflections in the conduit will not be permitted.

F. Parking Lot Design

Parking lots shall be designed for the *"Flood Mitigation"* storm not to exceed top of curb with a maximum depth at low points of one (1) foot. The *"Flood Mitigation"* storm shall be contained on-site or within dedicated easements. The portion of the parking lot detaining water during the *"Flood Mitigation"* storm may be considered as part of the detention calculation for the site.

4.6.3 Open Channels

A. Design Frequency

1. Open channels, including all natural or improved channels, swales, and ditches shall be designed for the *"Flood Mitigation"* storm event.

B. Design Criteria

1. Depending on velocities (See Table 4.6-E), constructed or improved channels shall be designed with either an earthen channel or a 10-ft. minimum concrete pilot channel section and appropriate side slope protection up to the *"Streambank Protection"* storm event elevation, as described in Section 4.3.

2. All channels with contributing drainage basins larger than one (1) square mile (sq. mi.) shall remain in their natural condition.

3. Channels with a contributing drainage area of less than one (1) sq. mi. shall remain in their natural condition if they are identified as being within an ESA by the current City of Denton ESA map. Channels not identified as being within an ESA may be channelized, with the channelization method being determined by analysis of the erosive velocities.

4. All improved channels shall be designed to carry the flood mitigation flow and shall have one (1) foot of freeboard as illustrated in Figure 4.8. Freeboard requirements at bends in all improved channels shall be the greater of the following:
    a. One (1) foot; or
    b. 10% of the flow depth
5. At a minimum, channels that require concrete lining shall be lined up to an elevation of the water surface resulting from the *"Flood Mitigation"* storm event.
6. Concrete lining of a stream channel is adding fill material into Waters of the United States (WOTUS) and must comply with Section 404 of the Clean Water Act, and all requirements outlined in DDC Section 7.4. Provide either proof of mitigation or letter of permission from the United States Army Corps of Engineers (USACE).
7. Unlined improved channels that contain bends may be required to be armored if maximum permissible velocities are exceeded.
8. Unlined improved channels shall have side slopes no steeper than 4H:1V and concrete-lined channels shall have side slopes no steeper than 2H:1V.
9. The minimum grade allowed on any channel, outfall channel, or ditch shall be three-tenths (3/10) foot per 100 feet for concrete-lined channels and five-tenths (5/10) foot per 100 feet for grass-lined channels.
10. Geotechnical investigations will be required for open channel designs to determine the type of soils present and allowable velocities shown in Table 4.6-D and Table 4.6-E.
11. For vegetative channels, flow velocities within the channel shall not exceed the maximum permissible velocities given in Table 4.6-D and Table 4.6-E.
12. An evaluation of streambank stabilization shall be included in the design of open channel improvements for areas upstream and downstream of the proposed improvement. Where indicated by the analysis, stabilization of the offsite bank areas shall be included in the proposed design.
13. HEC-RAS, or similarly capable software approved by the City's Engineer, shall be used to confirm the water surface profiles in open channels.
14. The final design of artificial open channels shall be consistent with the velocity limitations for the selected channel lining. Maximum velocity values for selected lining categories are presented in Table 4.6-D below.
15. If relocation of a stream channel is unavoidable, fill material into WOTUS must comply with Section 404 of the Clean Water Act, and all requirements outlined in DDC Section 7.4 . Provide either proof of mitigation or letter of permission from the United States Army Corps of Engineers (USACE).

The design of stable rock riprap lining depends on the intersection of the velocity (local boundary shear) and the size and gradation of the riprap material. More information on calculating acceptable riprap velocity limits is available in Section 3.2.7 of the *i*SWM™ Hydraulics Technical Manual Document.

Table 4.6-D: Roughness Coefficients (Manning's *n*) and Allowable Velocities for Natural Channels

Channel Description	Manning's *n*	Max. Permissible Channel Velocity (fps)
MINOR NATURAL STREAMS		
Fairly regular section		
1. Some grass weeds	0.030	3 to 6
2. Dense growth of weeds, depth of flow materially greater than weed height	0.035	3 to 6
3. Some weeds, light brush on banks	0.035	3 to 6
4. Some weeds, heavy brush on banks	0.050	3 to 6
5. Some weeds, dense willows on banks	0.060	3 to 6
- For trees within channels with branches submerged at high stage, increase values by	0.010	
- Irregular section with pools, slight channel meander, increase above values by	0.010	
Floodplain - Pasture		
1. Short grass	0.030	3 to 6
2. Tall grass	0.035	3 to 6
Floodplain – Cultivated Areas		
1. No crop	0.030	3 to 6
2. Mature row crops	0.035	3 to 6
3. Mature field crops	0.040	3 to 6
Floodplain – Uncleared		
1. Heavy weeds scattered brush	0.050	3 to 6
2. Wooded	0.120	3 to 6
MAJOR NATURAL STREAMS		
Roughness coefficient is usually less than for minor streams of similar description on account of less effective resistance offered by irregular banks or vegetation on banks. Values of 'n' for larger streams of mostly regular sections , with no boulders or brush	0.028 to 0.060	3 to 6
UNLINED VEGETATED CHANNELS		
Clays (Bermuda Glass)	0.035	5 to 6
Sandy and Silty Soils (Bermuda Glass)	0.035	3 to 5
UNLINED NON-VEGETATED CHANNELS		
Sandy Soils	0.030	1.5 to 2.5
Silts	0.030	0.7 to 1.5
Sandy Silts	0.030	2.5 to 3.0
Clays	0.030	3.0 to 5.0
Coarse Gravels	0.030	5.0 to 6.0
Shale	0.030	6.0 to 10.0
Rock	0.025	15

Notes:
[1] For natural channels with specific vegetation type, refer to Table 4.6-E for more detailed velocity control.

Table 4.6-E: Maximum Velocities for Vegetative Channel Linings

Vegetation Type	Slope Range [1] (%)	Max. Velocity [2] (fps)
Bermuda Grass	0 – 5	6
Bahia	-	4
Tall fescue grass mixtures [3]	0 – 10	4
Kentucky bluegrass	0 – 5	6
Buffalo grass [4]	5 – 10 > 10	5 4
Grass mixture [4]	0 – 5 5 – 10	4 3
Sericea lespedeza, Weeping lovegrass, Alfalfa	0 – 5	3
Annuals [5]	0 – 5	3
Sod	-	4
Lapped Sod	-	5

Notes:
[1] Do not use on slopes steeper than 10% except for side-slope in combination channel.
[2] Use velocities exceeding 5 fps only where good stands can be maintained.
[3] Mixtures of Tall Fescue, Bahia and/or Bermuda.
[4] Buffalo Grass and Grass Mixture will be required over other vegetation types where the maximum velocity is not exceeded.
[5] Annuals – used on mild slopes or as temporary protection until permanent covers are established.

Source: Manual for Erosion and Sediment Control in Georgia, 1996.

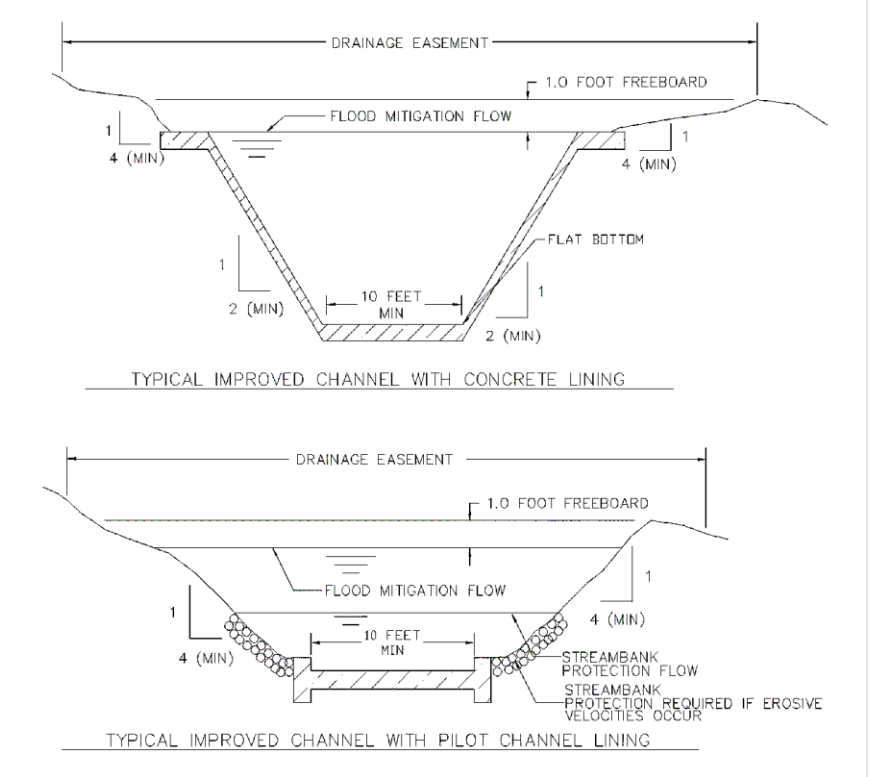


Figure 4.8 Freeboard Requirements and Channel Section Illustrations

C. Channel Drop Structures

1. Sloping channel drops are permitted and are required to have a maximum slope of 4H:1V. Vertical channel drops are not permitted.
2. The flow velocities in the channel upstream and downstream of the drop structure need to satisfy the permissible velocities allowed for channels (Table 4.6-D). The velocities shall be checked for flows produced by the *"Streambank Protection"* and *"Flood Mitigation"* storm events.
3. An apron shall be constructed immediately upstream of the chute or stilling basin to protect against the increasing velocities and turbulence which result as the water approaches the drop structure. The apron shall extend at least five (5) feet upstream of the point where flow becomes supercritical. In no case shall the length of the upstream apron be less than 10 feet.
4. An apron shall be constructed immediately downstream of the chute or stilling basin to protect against erosion due to the occurrence of the hydraulic jump. The apron shall extend a minimum of 10 feet beyond the anticipated location of the jump.
5. The design of drop structures is based on the height of the drop, the normal depths upstream and downstream of the drop structure, and discharge.
6. When used, channel drop structures shall be located near bridges or culverts, as directed by the City's Engineer.
7. The location of the hydraulic jump should be determined based on the upstream and downstream flow depths, and channel slopes.
8. The length of the hydraulic jump should be calculated to determine the length of the downstream apron required to prevent erosion.

4.7 Culverts

Culverts are cross drainage facilities that transport runoff under roadways or other improved areas.

4.7.1 Design Frequency

A. Culverts shall be designed for the *"Flood Mitigation"* storm.

B. The *"Flood Mitigation"* storm shall be routed through all culverts to ensure building structures (e.g., houses, commercial buildings) are not flooded and damage does not occur to a highway or adjacent property for this design event.

4.7.2 Design Criteria

A. Design Considerations

1. Roadway type;
2. Tailwater or depth of flow;
3. Structures, and property subject to flooding;
4. Emergency access; and
5. Road replacement costs.

B. Velocity Limitations

1. The maximum velocity shall be consistent with channel stability requirements at the culvert outlet.
2. The maximum allowable velocity is 15 fps, but outlet protection shall be provided where discharge velocities will cause erosion conditions.
3. To ensure self-cleaning during partial depth flow, a minimum velocity of 2.5 fps is required for the "*Streambank Protection*" storm when the culvert is flowing partially full.

C. Headwater Limitations

1. The *allowable headwater* is the depth of water that can be ponded at the upstream end of the culvert during the *"Flood Mitigation"* storm event. The *allowable headwater* will be limited by both of the following constraints or conditions:
   a. The headwater must not damage upstream property.
   b. The culvert headwater plus 12 inches of freeboard shall not exceed (i) top of curb or (ii) pavement for the low point of the road over the culvert, whichever is lower.

D. Tailwater Considerations

1. If the culvert outlet is operating with a free outfall, the critical depth and equivalent hydraulic grade line shall be determined.
2. For culverts that discharge to an open channel, the stage-discharge curve for the channel must be determined. *See* Section 2.1.4 of the *i*SWM™ Hydraulics Technical Manual on methods to determine a stage-discharge curve.
3. If an upstream culvert outlet is located near a downstream culvert inlet, the headwater elevation of the downstream culvert will establish the design tailwater depth for the upstream culvert.
4. If the culvert discharges to a lake, pond, or other major water body, the expected "*Flood Mitigation*" storm event of the water body will establish the culvert tailwater.

E. Other Criteria

1. Culvert skews shall not exceed 30 degrees, as measured from a line perpendicular to the roadway centerline, without approval.
2. Erosion, sediment control, and velocity dissipation shall be designed in accordance with Section 4.0 of the *i*SWM™ Hydraulics Technical Manual Document.
3. Where applicable, culverts must comply with DDC Section 7.4 regarding Environmentally Sensitive Areas.

4.7.3 Driveway Culverts

Driveway culverts are only permitted in non-curbed roadway sections. All driveway culvert construction shall be inspected by the City during construction. All driveway culverts shall meet the following requirements:

A. All new driveway culverts must be designed to convey flows from a "*Flood Mitigation*" storm. Replacement driveway culverts shall be designed to convey the maximum reasonable discharge based on the existing ditch dimensions adjacent to the culvert.

B. Culverts shall have a minimum pipe diameter of 18 inches.

C. Acceptable culvert material shall be Reinforced Concrete Pipe (RCP) with a diameter of 18 to 42 inches. The RCP must be designated Class III at a minimum.

D. Box culverts shall have a minimum height of 24 inches. Culverts under City streets used for entrances to a subdivision shall be made of approved classes of reinforced concrete pipe or box.

E. The top of pipe elevation must be below the adjacent roadway edge of pavement elevation.

F. Pipe culverts shall utilize a safety end treatment conforming to the most current version of the TxDOT standard detail Safety End Treatment Plan – Parallel Drainage (SETP-PD) with the slope of the riprap being 6H:1V.

G. A driveway approach may utilize a low-water crossing in lieu of a driveway culvert, if all of the following conditions are met:

1. The lowest elevation of the proposed crossing can be no more than eight (8) inches below the road edge elevation.
2. The proposed low-water crossing cannot create a ponding effect on the upstream ditch (i.e., ditch flow line must be equal to or higher than the crossing).
3. Minimum cross slope for the crossing of 1.5%.
4. Low-water crossing shall be constructed of concrete adhering to the City of Denton Standard Details.
5. Toe walls on each side of the crossing shall be extended at least 15 inches below grade to prevent undercutting.

H. Culvert Slope requirements:

1. Culvert slope must provide positive drainage.
2. Culvert slope shall be set as shown on the approved subdivision construction plans.
3. Minimum slope shall be 0.3%.

I. Ditch Slope Requirements

1. The ditch shall be graded upstream and downstream as far as necessary to provide positive drainage with no areas of standing water.
2. Minimum earthen slope is 0.5%.
3. Minimum concrete slope is 0.3% for 2-ft. concrete pilot channels, if 0.5% earthen slope is unobtainable.

4.8 Bridges

4.8.1 Design Frequency

A. *"Flood Mitigation"* storm must be used for all bridges.

4.8.2 Design Criteria

A. A freeboard of two (2) feet shall be maintained between the computed design water surface and the low chord of all bridges.

B. Design guidance is provided in *Section 3.4 of the iSWM™ Hydraulics Technical Manual Document*.

4.8.3 Other Criteria

A. Where applicable, bridges must comply with DDC Section 7.4 regarding Environmentally Sensitive Areas.

4.9 Detention Facilities

4.9.1 Design Requirements

A. Detention facilities shall be designed for the four storms ("*Water Quality*", "*Streambank Protection*", "*Conveyance*", and *"Flood Mitigation"*) for the critical storm duration that results in the maximum (or near maximum) peak flow.

B. Dry detention basins must be sized to temporarily store the volume of runoff required to provide flood protection up to the "*Flood Mitigation*" storm.

C. Routing calculations must be used to demonstrate that the storage volume and outlet structure configuration comply with Section 4.5.5 of this Manual.

D. A calculation summary shall be provided on construction plans as shown in the computation sheet in Figure 4.9 or its equivalent. Stage-storage-discharge values shall be tabulated and flow calculations for discharge structures shall be shown on the construction plans. Detention design shall follow *i*SWM™ guidelines. It is the responsibility of the Engineer of Record to use appropriate methodologies presented in *i*SWM™ based on specific basin characteristics. Detailed calculations and a design narrative shall be provided for review in a supplemental report that is referenced on the construction plans. In general, the narrative shall provide basic design information, such as the hydrologic method applied, design assumptions, pre- and post-development site conditions, downstream constraints, environmental considerations, and design software version used, if applicable.

E. Storage and dam safety design may be subject to the requirements of the Texas Dam Safety Program based on the volume, dam height, and level of hazard. Earthen embankments six (6) feet in height or greater shall be designed per the TCEQ guidelines for dam safety (*See* Texas Administrative Code, Title 30, Part 1, Chapter 299 Dams and Reservoirs for current dam safety criteria).

F. An Operation and Maintenance Manual must be submitted with the civil engineering plans for all private detention basins. Private detention basins shall be inspected by Public Works Inspection to ensure compliance with the design standards required by Section 7.5.3.F. of the DDC. Inspection fees will apply.

4.9.2 Design Criteria for Above Grade Detention Facilities

A. Grading Standards for Above Grade Detention Facilities:

1. Vegetated channel slopes shall not exceed 4H:1V slope. Concrete-lined embankment slopes shall not exceed 2H:1V slope. Vertical walls may be allowed but must be structurally designed to account for inundation of the base and drawdown upon pond draining and must have a 6-ft. high security fence at the top.

2. The side slope for any excavated detention basin, which is not in rock, shall not exceed a 4H:1V slope.
3. Bottom slopes of detention facilities should not be less than 1%.
4. Armored slopes shall be no steeper than 2H:1V.
5. The embankment crown width shall be determined based on a geotechnical investigation of the detention facility site. The minimum width of the embankment crown shall be 12 feet.
6. Earthen embankments used to impound detention water must have a non-permeable core and shall be based on a geotechnical investigation of the site. The geotechnical investigation shall be performed by a Professional Engineer, licensed by the State of Texas, and shall include at a minimum the type of material on-site (or other material to be used in the embankment), moisture content, liquid limit, plasticity index, and required compaction.
7. A Concrete pilot channel with a minimum width of 10 feet, and a minimum slope of 0.5% shall be constructed at the bottom of the detention pond. Privately maintained ponds shall have a concrete pilot channel with a minimum width of six (6) feet.
8. Private Detention Basins shall be designed with 10-ft. wide unobstructed maintenance access around the entire perimeter of the pond.
9. Public Detention Basins shall be designed with 20-ft. wide unobstructed maintenance access around the entire perimeter of the pond.
10. Where deemed necessary by the City's Engineer, security fencing with a minimum height of six (6) feet shall encompass the detention storage area if the velocity, depth, or slopes create a potentially dangerous condition. The fence shall be designed to allow access for maintenance and so as not to restrict stormwater flow into or out of the detention basin. A maintenance equipment access ramp shall be provided for all detention facilities. The slope of the ramp shall not exceed 6H:1V and the minimum width shall be 12 feet.

B. Emergency Spillway, Overflow Path, and Freeboard:
1. A freeboard of one (1) foot will be required between the *"Flood Mitigation"* storm water surface elevation and top of bank.
2. An emergency spillway shall be provided at the flood mitigation maximum storage elevation with sufficient capacity to convey *"Flood Mitigation"* storm inflow rates with six (6) inches of freeboard. This is the peak of the inflow hydrograph coming into the pond and must not account for attenuation effects of the pond. Spillway requirements must also meet all appropriate State and Federal criteria.
3. An emergency overflow path, free of structures or obstructions, must be provided to convey the spillway design discharge to a downstream ROW or drainageway with adequate capacity for the discharge. No impediments to flow are allowed within the emergency overflow path (E.g., fences, trees, parking areas, or buildings). If a fence around a detention facility is needed to restrict access, the bottom of the fence must be elevated to provide a minimum of one foot of freeboard above the emergency overflow WSEL where the fence crosses the spillway. Nevertheless, fences across spillways should be avoided whenever possible. Even if the fence is elevated to the freeboard elevation, there is still the potential for the fence to catch debris floating on the water surface.
4. An emergency spillway must be constructed of concrete.

5. Design calculations shall be provided for all spillways and outlet structures.

C. Landscaping Requirements:

1. All detention basins shall be designed with plantings that minimize erosion based on expected inundation frequencies. Design guidance is provided in the *iSWM™ Landscape Technical Manual Document*.

D. Multiple Use Guidance

Limited recreational equipment (such as picnic tables or playground equipment) and trees may be permitted in private detention facilities with the following restrictions:

1. User access must be provided at a maximum 10% slope in at least two (2) locations, or one (1) location that comprises not less than 20% of the perimeter of the facility.

2. No recreational equipment is permitted in any portion of the facility that lies more than 18 inches below the flood mitigation water surface elevation level of the facility.

3. Recreational structures including, but not limited to, picnic tables and playground equipment, must be rust-resistant and anchored to the ground.

4. Mulch, wood chips, gravel, or rubberized pellets are not permitted within a detention facility due to the likelihood of their floating into the outlet structure.

5. Trees, shrubs, and other woody vegetation will not be permitted in the embankment of any detention facility or in the maintenance access area around such a facility.

6. A maximum of one (1) isolated tree per 5,600 sq. ft. may be permitted in the recreational area of the pond. A trash rack must be used to prevent clogging of the outlet structure. No bark mulch may be used around trees.

E. Retaining Walls

1. Any freestanding retaining wall used to detain water must be designed by a structural engineer to withstand the expected hydraulic forces when the detention area is filled to capacity. These walls must be constructed using reinforced concrete.

2. Any inlet or pipe connections to retaining walls must be designed with a reinforced concrete headwall. The height of this headwall shall match the height of the adjacent retaining wall. The most recent TxDOT details for concrete headwalls shall be used to determine other headwall dimensions and reinforced schedule.

4.9.3 Design Criteria for Underground Detention Facilities

Underground detention is highly discouraged because of the potential for deferred maintenance, the difficult and potentially hazardous nature of access for maintenance, and issues related to anaerobic conditions and pollutant mobility from devices that retain water between events. In any instance where underground detention is contemplated, thorough consideration must be given to the concerns described above to ensure ongoing inspection, maintenance, and functionality. Care should be taken to address material selection for underground detention due to the potential for adverse soil conditions to inhibit the system from functioning properly. A geotechnical engineer shall be consulted to ensure soil and other conditions are appropriate for the selected detention material.

A. Underground detention facilities shall be designed with reinforced concrete and have a minimum pipe diameter of 30 inches to allow for safe access and maintenance of the facility.

B. If an underground vault has multiple chambers, access openings with a maximum spacing of 500 feet must be provided for each chamber.

C. Underground facilities must be located to enable safe access for maintenance and minimize disruption of aboveground uses during maintenance. Access openings shall not be placed in areas that are routinely used for parking.

D. Easements must be provided for all underground detention facilities. If underground detention facilities are bound by private property, the easements must include an additional four (4) feet from the perimeter of the facilities.

E. Underground detention and water quality facilities are prohibited underneath buildings, walls, or other structures.

F. Every SWFMA involving underground detention and water quality facilities must include inspection and maintenance requirements to be performed quarterly and following any rainfall event of 0.5 inches or more. The inspection and maintenance frequency may be reduced after five (5) years of operation, if the owner demonstrates that a lesser frequency is appropriate.

G. A surface emergency overflow path, free of obstructions, must be provided for all underground detention facilities. The emergency overflow path must have sufficient capacity to convey the *"Flood Mitigation"* storm inflow rates to the underground detention facility. This is the peak of the inflow hydrograph coming into the underground detention facility, and must not account for any attenuation effects from the facility. The criteria for emergency overflow paths for surface detention facilities denoted in Section 4.9.2 above also apply to underground detention facilities.

H. Outlets from underground detention must consist of a pipe that can convey 120% of the 100-year outflow, with a minimum diameter of 12 inches. The invert of the outlet pipe must be at the lowest point in the detention facility to ensure that it fully drains.

I. Underground detention facilities shall be sloped to drain at a minimum floor slope of one (1) %.

4.9.4 Design Criteria for Parking Lot Detention

Parking lot detention may be allowed if the following minimum criteria are met:

A. Use of parking lot surface area as detention is permitted, but only up to the lowest curb elevation of the parking lot.

B. The maximum ponding depth for the 100-year storm must be no more than 12 inches at the deepest point.

C. The outlet must be designed to minimize modifications that affect detention functions. The applicant must evaluate potential future resurfacing activities for impacts to detention volumes and release rates.

D. Ponding water in frequently used portions of parking lots must be avoided. At least two signs are required for all parking lot detention areas. The signs must have a minimum area of 1.5 square feet and contain the following message:

WARNING

This area is a detention basin and is subject to periodic flooding to a depth of (provide design depth).

Sign materials, geometry, and location must be submitted to Development Facilitation and approved by the City's Engineer.

4.9.5 Design Criteria for Pumped Detention

A. A detention facility may not rely on a pump or other mechanical equipment to drain water during a design storm.

4.9.6 Outlet Structures for Detention Facilities

A. Design Frequency

1. *"Water Quality"* storm
2. *"Streambank Protection"* storm
3. *"Conveyance"* storm
4. *"Flood Mitigation"* storm

B. Design Criteria

1. Outlet structures shall be designed in accordance with Section 2.2 of the *iSWM™ Hydraulics Technical Manual*. For water quality, refer to Section 2.2.3 for design of extended detention outlets.
2. The required storage volumes for "*Water Quality*", "*Streambank Protection*", "*Conveyance*", and *"Flood Mitigation"* storm events must be estimated.
3. If a detention facility includes extended detention, refer to Section 2.2.3 of the *iSWM™ Hydraulics Technical Manual* for design requirements.
4. All outlet orifices must be adequately protected from clogging and designed to ensure that people and large animals are kept out of confined outlet areas. Refer to Sections 2.2.5-*Extended Detention Outlet Protection* and 2.2.6-*Trash Racks and Safety Grates* of the *iSWM™ Hydraulics Technical Manual* for design guidance.
5. Any top orifice on an outlet riser must be designed with a grate to prevent fall injuries.
6. Outlet velocities shall be within the maximum allowable range based on channel material, as shown in Table 4.6-D and Table 4.6-E.
7. Outlet protection and energy dissipation facilities must be designed to avoid erosion problems downstream from outlet devices and emergency spillway(s).
8. Buoyancy calculations must be performed for the outlet structure and footing to ensure the outlet structure will not float. Flotation will occur when the weight of the structure is less than or equal to the buoyant force exerted by the water.
9. Any outflow structure that conveys water through an embankment in a conduit shall be reinforced concrete designed to support the external loads. The conduit shall be able to withstand the internal hydraulic pressure without leakage under full external load or settlement and must convey water at the design velocity without damage to the interior surface of the conduit.
10. The minimum opening of an inlet shall be six (6) inches in diameter or a 6-in. by 6-in. square. Smaller inlet openings may be used with a junction box and properly sized outlet structure.

11. A concrete headwall and wingwalls shall be constructed at the outlet pipe opening. Orientation of the wingwalls will be governed by site specific conditions. Headwalls and wingwalls shall be designed to TxDOT standards.

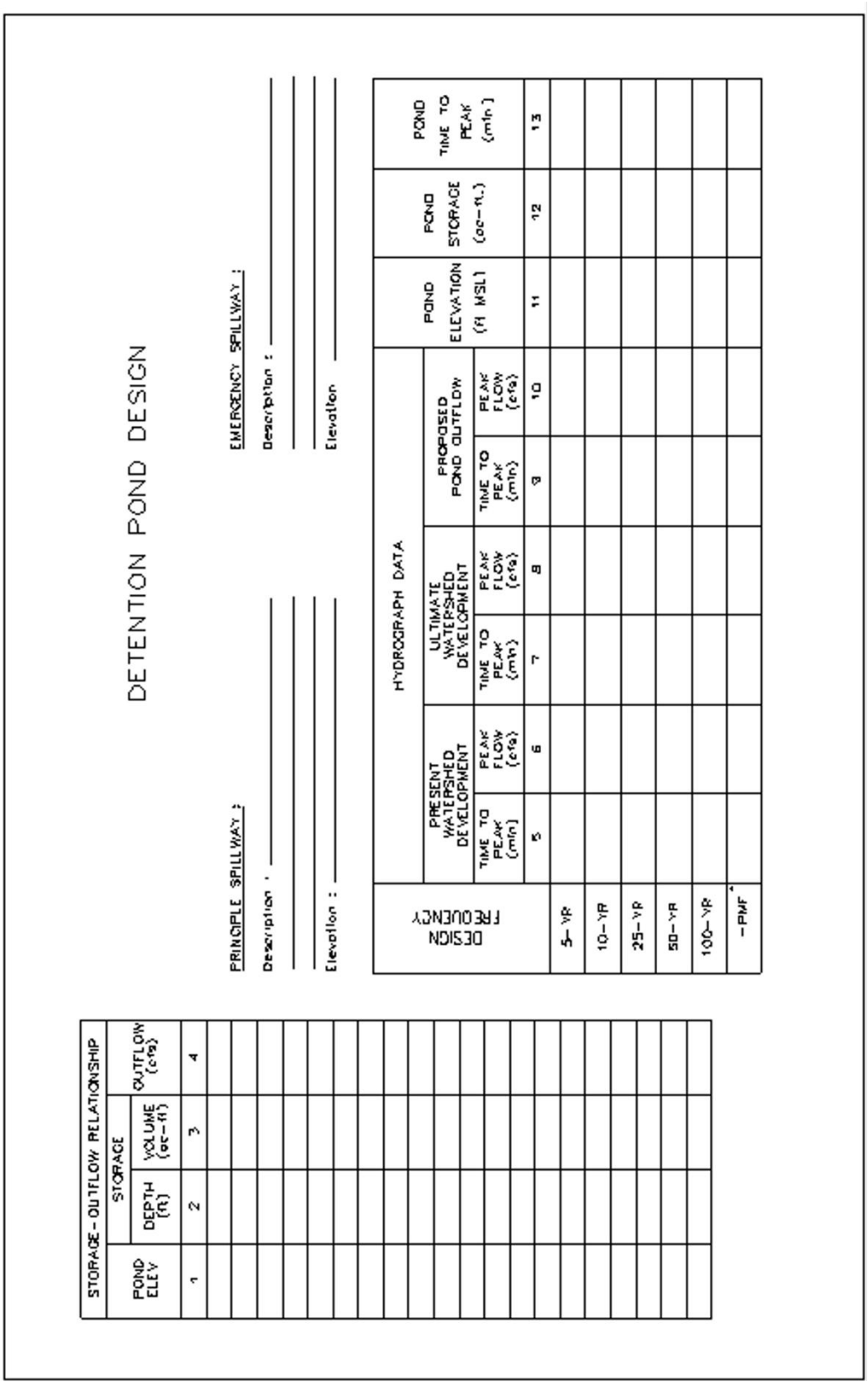


Figure 4.9 Computation Sheet for Detention Pond Design

4.10 Energy Dissipation

All drainage system outlets, whether for closed conduits, culverts, bridges, open channels, or storage facilities, shall provide energy dissipation when necessary to protect the receiving drainage element from erosion.

4.10.1 Design Frequency

A. *"Flood Mitigation"* storm

4.10.2 Design Criteria

A. Erosion problems at culvert, pipe and engineered channel outlets are common. Determination of the flow conditions, scour potential, and channel erosion resistance shall be standard procedure for all designs.

B. Energy dissipaters shall be employed whenever the velocity of flows leaving a stormwater management facility exceeds the erosion velocity of the downstream area channel system.

C. Energy dissipater designs will vary based on discharge specifics and tailwater conditions.

D. Outlet structures shall provide uniform redistribution or spreading of the flow without excessive separation and turbulence.

4.10.3 Recommended Energy Dissipater for outlet protection

A. Concrete or grouted rock riprap apron

B. Riprap outlet basins

C. Baffled outlets

D. Grade Control Structures

Design guidance is provided in Section 4.0 of the *i*SWM™ Hydraulics Technical Manual.

4.11 Floodplain

4.11.1 Floodplain Development Criteria

A. Floodplain alterations shall be allowed only if all the following criteria are met:

1. An approved Floodplain Development Permit must be issued by the City before any development is done within the floodplain.
2. Flood studies shall include flows generated for existing conditions and fully-developed conditions for the 10, 50, 100, and 500-year storm events.
3. Alterations shall not increase the 100-year fully-developed water surface elevation on other properties.
4. Alterations to the regulatory Floodway shall not increase the 100-year fully-developed water surface elevation at any point.
5. Alterations shall be in compliance with Federal Emergency Management Agency (FEMA) guidelines.

6. Alterations of the floodplain shall meet the requirements of Section 4.5 of this Manual.
7. Alterations shall result in no loss of valley storage for a Major Creek, as defined by the DDC, and a 15% maximum loss of valley storage for any other tributary for any reach, except at bridge and culvert crossings where it can be proven that there are no detrimental effects upstream or downstream.
8. Alteration of floodplain areas shall not cause any additional expense, including maintenance, related to any current or projected public improvements.
9. The floodplain shall be altered only to the extent permitted by equal conveyance on both sides of the natural channel, as defined by the USACE in a HEC-RAS analysis. The right of equal conveyance applies to all owners and uses, including greenbelt, park areas, and recreational areas. Owners may relinquish their right to equal conveyance by providing a written agreement to the City's Engineer.
10. A grading permit and/or construction plan approval shall be required to perform any grading activities on site.
11. The toe of any fill shall parallel the natural direction of the flow.
12. Floodplain alterations shall incorporate and consider other City planning documents and ordinances such as the Tree Preservation Ordinance (Section 7.7.4 – DDC), , the Subdivision Ordinance (Subchapter 8 – DDC), and the Floodplain Prevention and Protection Ordinance (Chapter 30 – City of Denton, Code of Ordinances).
13. Unless a pre-existing model is in place, USACE's HEC-HMS and HEC-RAS shall be used. A request to use another type of hydrologic or hydraulic model must be submitted for approval through a design deviation request. The Modified Puls method shall be used for flood routing information to ensure that the cumulative effects of the reduction in floodplain storage of floodwater will not cause downstream or upstream increases in water surface elevations and erosive velocities. If the Modified Puls method is not feasible, a request to use another type of flood routing method must be submitted for approval through a design deviation request.

B. The engineer of record is responsible for providing documentation of the relevant USACE approved permits prior to beginning modification of the floodplain and prior to causing any impacts to WOTUS. If applicable, the engineer of record is also responsible for providing a signed and sealed statement detailing why such permits are unnecessary.

C. Verification of Floodplain Alterations:
1. The owner and/or developer shall furnish, at their expense, to Development Services sufficient engineering information to confirm that the minimum FFEs proposed meet the requirements of the Flood Prevention Ordinance.
2. Construction plans will not be released for construction within areas subject to a Conditional Letter of Map Revision (CLOMR) or amendment until such plans are accepted by Development Services and FEMA.
3. Letters of Map Revision (LOMR) applications shall be submitted to Development Services (i) no later than 60-days from the City's final acceptance of the construction and (ii) prior to submittal to FEMA.
4. All submittals to FEMA shall be submitted to Development Services prior to submittal to

FEMA. A copy of all responses to FEMA comments shall be submitted to the City.

D. Development within the floodplain which does not result in any change to the topography, the amount or location of impervious area, or any change in the characteristics of the floodplain cross-section, such as underground utility construction, may not require a flood study, CLOMR, LOMR, or DSA unless requested by the City.

The following decision charts are intended to consolidate the floodplain development criteria in the City of Denton. They reference information found in the DDC Subchapters 7.4 and 7.5, the Code of the City of Denton, Texas, Chapter 30, and this Manual. They are not an exhaustive list of criteria and are only to be used as guidance as to the information provided in the above-referenced documents. Criteria in those documents supersedes the decision charts.

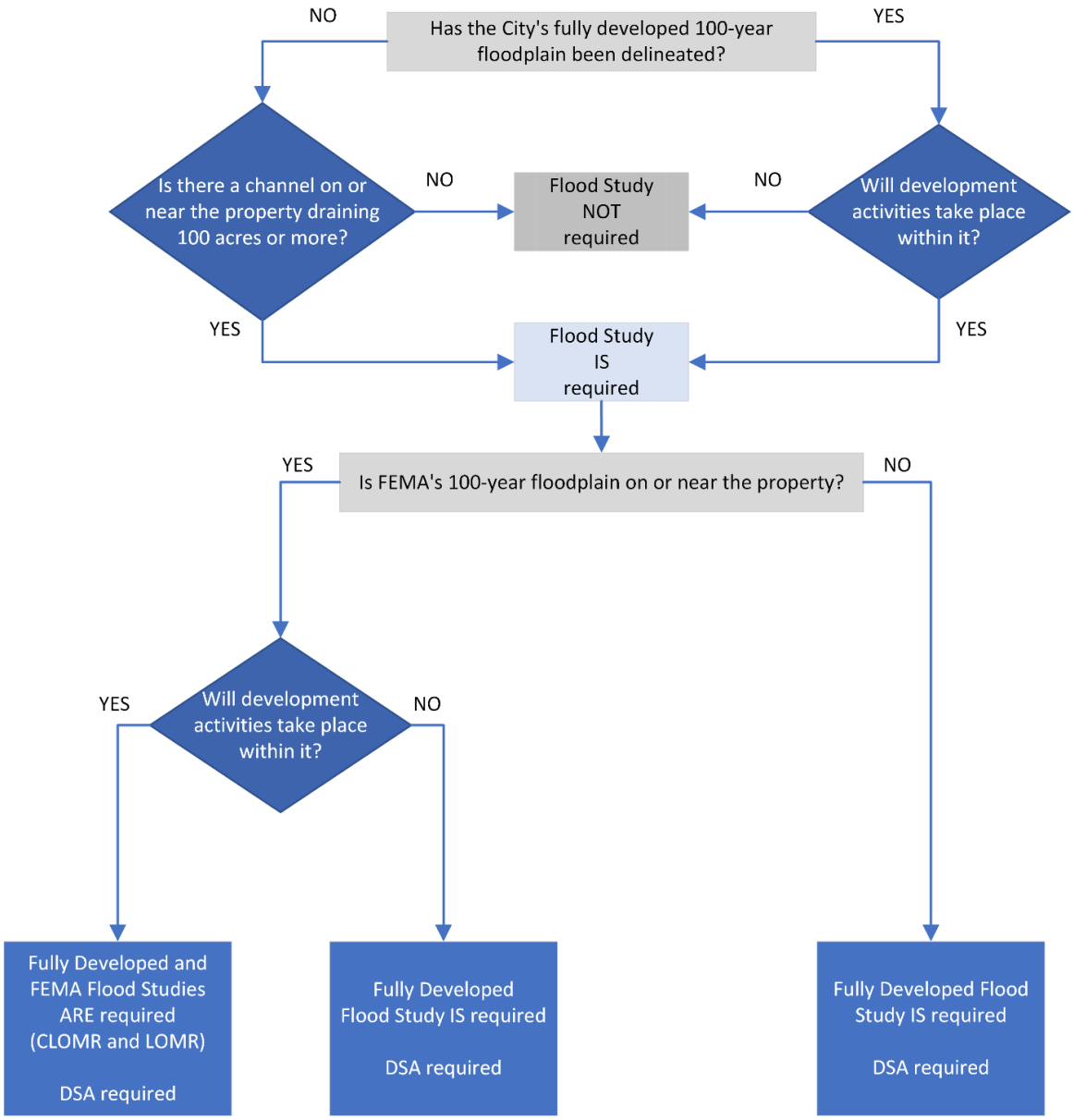


Figure 4.10 Flood Study Decision Chart

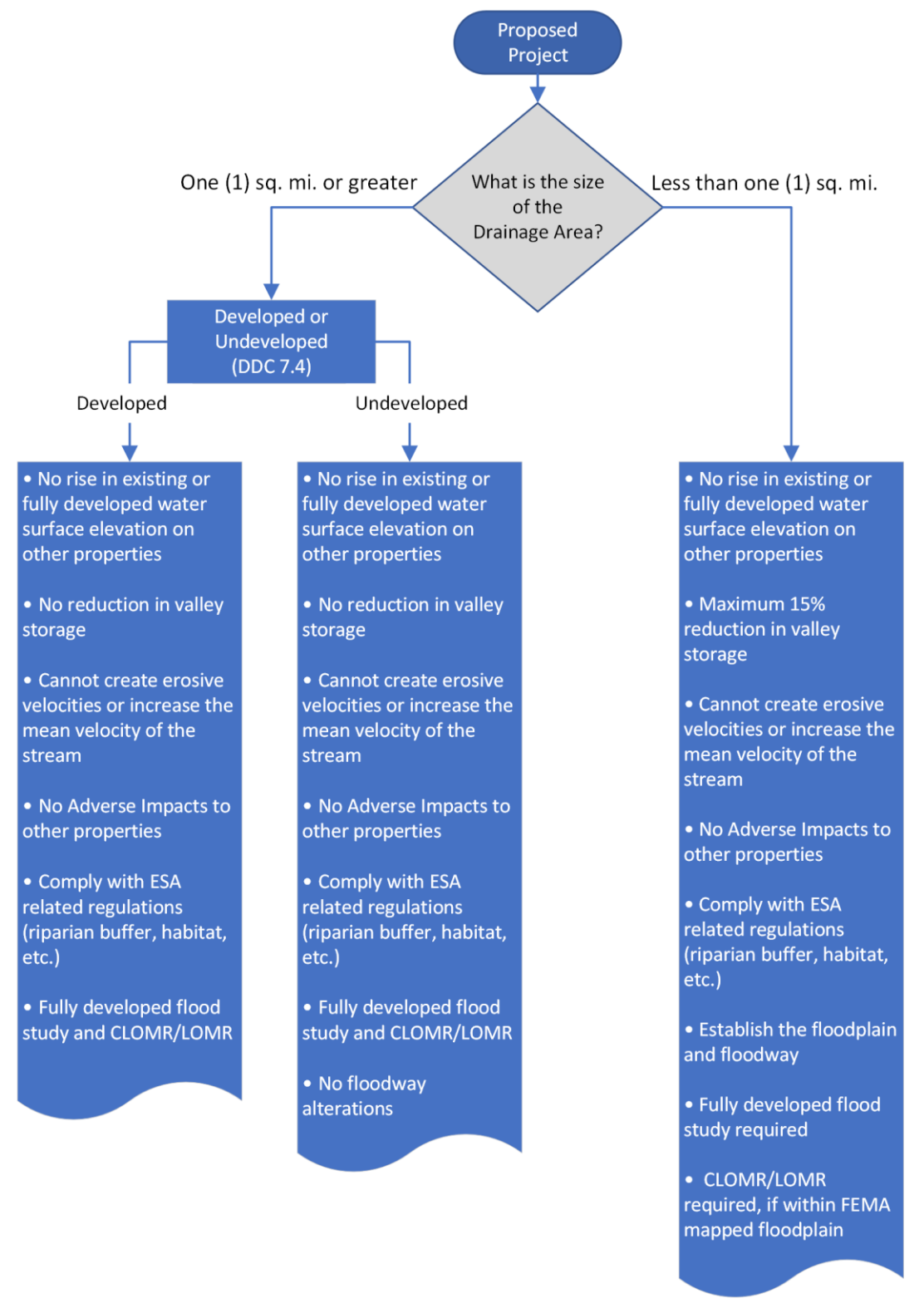


Figure 4.11 Summarized Floodplain Development Procedure

4.11.2 Procedures for Floodplain Alteration

Floodplain development is permitted when it complies with all requirements of the DDC, Flood Prevention Ordinance, and this Manual. The following are the engineering criteria for such requests.

Developments which impact designated FEMA flood plains in the City (Zones AE, A, and X shaded) shall submit minimum data required by FEMA, indicated on the City's CLOMR submittal checklist, and/or indicated in this Manual to FEMA for conditional approval. The Conditional Letter of Map Revision (CLOMR) shall be submitted to the City prior to approval of any Zoning Compliance Plan. Approval of CLOMR from FEMA will be required prior to acceptance of Civil Engineering Plans.

A. A written description of the scope of the proposed project and the methodology used to analyze the project's effects.

B. Hydraulic backwater models for 10, 50, 100, and 500-year floods for the following:
   1. Duplicate of the effective FIS model. The model must include:
      a. Existing conditions (effective FIS model including cross-sections through the project site. All cross-sections should reflect conditions prior to construction of the project); and
      b. Proposed conditions (existing conditions model reflecting the proposed project).

C. Floodway hydraulic backwater models of the following:
   1. Duplicate effective;
   2. Existing condition; and
   3. Proposed conditions.

D. In all the above hydraulic models, the following rules will apply:
   1. The hydraulic parameters, such as bridge loss coefficients, "*n*" values, etc., used in the effective FIS models will only be changed where obvious errors or changes have taken place and must be documented;
   2. The computed water surface elevation profiles must converge with the existing profiles; and
   3. Information should be shown on a map of suitable scale and topographic definition to provide reasonable accuracy.

E. A copy of the FIRM with the project area indicated.

F. Topographic mapping of the entire area covered by the proposed condition model, indicating the locations of all cross-sections used in the hydraulic model and delineating the proposed 100-year flood plain boundary.

G. Topographic mapping of the entire area covered by the proposed conditions model, indicating the locations of all cross-sections used in the hydraulic model and delineating:
   1. The proposed 100-year and 500-year floodplain boundaries; and
   2. The proposed floodway boundary.

H. Projects must comply with the requirements of 44 C.F.R. § 60.3(d)(2).

I. Upon completion of the proposed project, "as-built" and final LOMR plans certified by a Professional Engineer licensed by the State of Texas shall be submitted to the City for review and subsequent transmittal to FEMA. FEMA requires that individual legal notices be sent to all affected property owners when development (cut or fill) occurs in the regulatory floodway that would cause

any rise in the 100-year FIS water surface elevation. Public notice in the official community newspaper is required for proposed modifications to the regulatory floodway.

J. All items should be labeled for easy cross-referencing to the hydraulic model and summary data.

K. FEMA may have questions regarding the project. The engineer of record must address all of FEMA's comments. It is not anticipated, but if revisions to the development are required by FEMA, the developer is responsible for making the changes.

4.11.3 Fully Developed Water Surface Elevation Calculations

A. The following hydraulic data should be submitted to the City, preferably using the USACE HEC-RAS program to compute the channel's water surface elevation. The data should be submitted electronically as part of the CLOMR, LOMR, or flood study submittal.

1. Duplicate of the effective City fully developed backwater model or as developed by developer or property owner and approved by the City.
2. Modified existing condition backwater model – this model should include pre-development cross-sections through the project site obtained from field surveys or updated topographic information.
3. Proposed condition reflecting the development's impact on the flood plain area.
4. Water surface elevation and velocity summary tables tabulating the results of the above analysis.
5. Topographic map at a suitable scale with cross-sections that delineates the existing and proposed 1% chance (100-year) fully developed flood plain and shows the area being developed.
6. Analysis of the existing and proposed valley storage conditions of the area.
7. Documentation from the USACE determining if a 404 permit is required for the project.

4.11.4 Floodplain Alteration Guidelines

A. Side Slopes

1. To ensure maximum accessibility to the floodplain for maintenance and other purposes, and to lessen the probability of slope erosion during periods of high water, maximum slopes of filled area shall usually not exceed 4H:1V. Grass cover is required for all cut and fill slopes unless other armoring is required. Concrete riprap or an approved equal erosion protection measure is required on slopes steeper than 4H:1V. Vertical walls, terracing and other slope treatments will be considered only as:
    a. Part of a landscaping plan submission, and
    b. If no unbalancing of stream flow results.

B. Vegetation/Landscaping

1. Engineering plan submission shall include plans for:
    a. Erosion control of cut and fill slopes;
    b. Restoration of excavated areas; and
    c. Tree protection in and below fill areas.

2. Landscaping should incorporate natural materials (earth, stone, and wood) on cut or fill slopes wherever possible.
3. Applicant shall show in the plan the general nature and extent of existing vegetation on the tract, the location of trees in accordance with the requirements of the tree survey required by Section 7.7.4.E of the DDC, the areas which will be preserved, altered, or removed as a result of the proposed alterations.
4. Locations and construction details should be provided, showing how trees will be preserved in areas which will be altered by filling or paving within the drip line of those trees.
5. Applicant shall also submit plans showing location, type, and size of new plant materials and other landscape features planned for altered flood plain areas.

4.12 Drainage and Floodplain Easements

4.12.1 General

A. Drainage and floodplain easements shall be provided for all open natural streams or manmade drainage facilities. Easements shall encompass all areas lower than a ground elevation defined as being the highest of the following:
   1. 15 feet outside the calculated fully developed water surface elevation and associated flood boundary based on a design storm whose frequency is 100 years. All contributing watersheds are to be treated as fully developed for purposes of calculating the water surface elevation.
   2. The top of the high bank plus a minimum of 20 feet, if higher than stated in A.1. above.
   3. Existing natural banks with a slope steeper than 4H:1V shall have the easement line no closer than the intersection of a 4H:1V line extending from the toe of the slope to the proposed grade at the top of the bank, plus an additional 15 feet.
   4. Additional access area may be required according to the Section 4.12.2 below.

4.12.2 Storm Drain Easements

A. Above Ground Systems

Where an access road is required adjacent to a channel, an additional easement area of a minimum width of 15 feet shall be provided. The maximum cross slope shall be 2%. All access roads adjacent to improved channels shall be located within the drainage easement.

1. No structures, pavement, landscaping, or other above-ground man-made improvement shall be placed in a drainage easement, except where the easement is a public or private open space or park. Any such improvement within a drainage easement must be approved through a design deviation request.

B. Closed Systems

1. Easements for closed drainage systems shall meet the following minimum standards as shown below in Table 4.12-A.

Table 4.12-A: Easement Requirements for Closed Drainage Systems

Pipe or Box Size	Minimum Easement Width (feet)
36 inches and under	16
42 to 54 inches	20
60 to 66 inches	25
72 inches and above	30

2. Utilities such as water and sanitary sewer lines may share a portion of a drainage easement, containing an underground enclosed drainage system where an additional easement width for a minimum of 10 feet is added to create a public drainage and utility easement. No utilities shall be located in any lined channel, pipe, or box in such a way as to interfere with flow capacity or maintenance of or access to the channel, pipe or box.
3. A drainage easement shall be provided for the area within a required outfall channel or ditch to the point where the flowline "day lights" on natural grade or matches existing topography.
4. To provide for maintenance, a drainage easement shall be provided at least 25 feet beyond any outfall headwall.
5. No structures, pavement, landscaping, or other above-ground man-made improvement shall be placed in a drainage easement containing a closed drainage facility.

4.12.3 Channel Access

A. Access areas and ramps shall be provided for all publicly maintained channels to allow for maintenance of the channels. These access areas and ramps shall be contained within a drainage easement. Access areas shall have a width of at least 12 feet, a minimum cross slope of 2%, and a maximum cross slope of 5%.

B. Access easements shall be provided from the public ROW to the access area, if the access area is not directly connected to the public ROW. Access easements shall remain free of obstacles that block the use of the easement, including ungated fencing across the easement.

C. A concrete drive approach serving the access easement must be available and free of obstructions. Any sidewalk crossing the access easement must be constructed using a residential street cross-section, or otherwise designed to accommodate vehicle loads so that equipment may use the access easement without damaging the sidewalk.

D. Access to all improved earthen channels shall be provided by one (1) of the following methods, depending on the size and depth of the channel:
   1. A clear access area must be provided on one side of the improved earthen channel along the full length of the channel; or
   2. If the channel is deeper than 4 feet or has a top width greater than 25 feet, an access area must be provided on both sides along the full length of the channel. Access areas shall have a width of at least 15 feet, a minimum cross slope of 2%, and a maximum cross slope of 5%.

E. All lined channels, and earthen channels with concrete pilot channels shall have a minimum bottom width of ten (10) feet and shall be provided with concrete access ramps. Concrete access ramps

shall have a minimum width of 12 feet, maximum slope of 6H:1V, and maximum cross slope of 5%. All access roads shall be located within a dedicated easement. Access road pavement cross-sections shall conform to the standards of the concrete residential street cross-section detail located in the City of Denton Standard Details.

4.12.4 Detention Facilities Easements

A. Detention facility easements must encompass the entirety of the detention facility plus any required maintenance access areas adjacent or leading to the facility.

B. All detention maintenance access easements must be connected to a public ROW, be a minimum of 10 feet wide, and be free of obstructions which could prevent personnel and equipment from accessing the detention facility.

4.12.5 Post-Construction Water Quality Control Structure Easements

A. All post-construction structural stormwater control structures must be located within an inspection access easement. The intent of this easement is to allow City staff to access and inspect the control structure to ensure it is being maintained in accordance with the SWFMA. This easement must be connected to a public ROW, be a minimum of five (5) feet wide, and be free of obstructions which could prevent City staff from accessing the control structure.

4.12.6 Fences

A. Fences in drainage easements are prohibited by the DDC, except as specifically provided for below.

1. Fences may cross drainage easements that contain an underground stormwater system provided the fence is constructed with any type of non-masonry material and the fence is constructed with knock-out panels to facilitate maintenance.

2. Fences in drainage easements that contain overland flow may cross the easement if the fence is constructed with wrought iron (pickets and rails), pipe, or pipe and cable. Fence height, minimum picket spacing, and maximum ground clearance spacing shall be governed by appropriate child safety measures.

3. No fences are allowed across inlet or outlet structures of drainage detention facilities. Fences are permitted around the detention facility if they do not block or inhibit the flow conveyance of the detention facility.

4. No fencing is allowed across easements which share water or wastewater facilities with the drainage facility.

B. Fences in the floodplain are prohibited.

4.13 Water Quality

4.13.1 Water Quality Protection Volume

It is required that all development sites disturbing a land area larger than (1) one acre or part of a common plan of development disturbing a land area greater than (1) one acre treat their stormwater runoff either through extended detention and/or include site development controls necessary to remove 80% of the TSS from the water quality protection volume (WQ_V). *See* the iSWM™ Water Quality Protection Technical Manual

for information regarding the design of this WQ_V and appropriate discharge design. *See* the *i*SWM™ Site Development Controls Technical Manual for information regarding structural stormwater controls and their ability to remove pollutants in stormwater runoff to protect water quality. Any combination of structural stormwater controls may be used to achieve the required 80% TSS removal from all runoff from impervious surfaces on the site. Any proposed proprietary treatment devices must be certified by either the New Jersey Department of Environmental Protection (NJDEP), the Washington state Technology Assessment Protocol – Ecology (TAPE) program, or the Technology Acceptance Reciprocity Partnership (TARP).

The percent TSS removal (%TSS) that is achieved on a site can be calculated using equation 4.8 below. This equation is an area-weighted TSS reduction equation that accounts for the TSS reduction attributable to each stormwater treatment best management practice (BMP) that is utilized on the site.

$$\%TSS = \frac{\Sigma_n^1 (TSS_1A_1 + TSS_2A_2 + \ldots + TSS_nA_n)}{\Sigma_n^1 (A_1 + A_2 + \ldots + A_n)} \quad \textbf{[Eqn. 4.8]}$$

Where: TSS_n = TSS removal percentage for each structural BMP located on-site (%);
A_n = the area draining to each BMP (acres).

When two or more BMPs are used in series (stormwater discharges from one BMP into another), a different calculation is necessary. This scenario is called a ***treatment train***. Stormwater discharging from the upper most BMP will be considerably "cleaner" than the influent, meaning TSS particle sizes will be much smaller. Pollutant removal rates for BMPs used in a treatment train are not additive. To calculate the total % TSS removal for a treatment train comprised of two or more structural BMPs, the following equation should be used.

$$TSS_{train} = A + B - \frac{A \times B}{100} \quad \textbf{[Eqn. 4.9]}$$

Where: TSS_{train} = total TSS removal for treatment train (%);
A = % TSS removal of the first (upstream) BMP
B = % TSS removal of the second (downstream) BMP

4.13.2 Water Quality Hotspots

Not all structural stormwater controls are appropriate for receiving runoff from hotspots. Hotspots are land uses or activities which produce higher concentrations of trace metals, hydrocarbons, or other priority pollutants. Examples of hotspots might include gas stations, convenience stores, marinas, public works storage areas, garbage transfer facilities, material storage sites, vehicle service and maintenance areas, commercial nurseries, vehicle washing/steam cleaning sites, landfills, construction sites, industrial sites, industrial rooftops, auto salvage or recycling facilities, and dog parks. Only appropriate structural stormwater controls identified in the *i*SWM™ Site Development Controls Technical Manual may be used for receiving hotspot runoff.

Facilities that discharge stormwater associated with industrial activity permitted under TCEQ Multi-Sector General Permit (TXR050000) may incorporate WQ_v requirements into point source discharge control requirements.

4.13.3 Required Stormwater Facility Maintenance Agreements

All private post-construction structural stormwater controls shall require a SWFMA in accordance with Section 4.14 of this manual.

4.13.4 Construction Erosion and Sediment Control Requirements

All land-disturbing activities must include provisions for erosion and sediment control in accordance with Section 7.3 (Land-Disturbing Activities) of the DDC, the *i*SWM™ Water Quality Technical Manual, the *i*SWM™ Construction Controls Technical Manual, and the *i*SWM™ Site Development Technical Manual.

A. Erosion Control Plans

The purpose of the Erosion Control Plan is to reduce erosion, retain sedimentation and, to the greatest extent, prevent off-site drainage during land-disturbing and construction activities. It does this by assessing the site's erosion potential to determine structural controls and site management practices, also known as Best Management Practices (BMPs).

1. General Erosion Control Plan Requirements

   The erosion control plan must contain the following:

   a. A narrative description of the project, total acreage of the parcel, total acreage to be disturbed, the construction sequence, the potential sources of erosion and sedimentation, BMPs, their maintenance, and inspection procedures.

   b. A list of BMPs that will be implemented during each phase of construction, such as preservation of existing vegetation, stockpile management, silt fencing, outlet protection, runoff interception, vegetated buffers, etc.

   c. A sequence of construction of the development site, including stripping and clearing; rough grading; construction of utilities, infrastructure, and buildings; and final grading and landscaping. Sequencing shall identify the expected date on which clearing will begin, the estimated duration of exposure of cleared areas, areas of clearing, installation of temporary erosion and sediment control measures, and establishment of permanent vegetation.

   d. Description of on-site spoils and borrow areas, including handling and disposal of borrow materials, as well as size, depth of fill and revegetation procedures.

   e. Descriptions of on-site and adjacent critical areas

   f. Description of vegetative temporary and permanent stabilization practices

      i. Areas within the limits of construction (LOC) that will require temporary stabilization

      ii. Seeding mixtures and rates, types of sod, method of seedbed preparation, expected seeding dates, type and rate of lime and fertilizer application, and kind and quantity of mulching for both temporary and permanent vegetative control measures

      iii. Specific limits on the time frame between initial exposure of soils by construction activity to the temporary or final stabilization of those surfaces

      iv. Schedule for converting temporary controls to permanent functions (e.g. basins)

   g. Drawings and specifications of structural controls and site management practices, with supporting calculations and assumptions

2. Phased Erosion Control Plans

   For projects with earthwork construction totaling five (5) acres or more, a two-phased erosion control plan is required for all non-linear projects. Each phase must be provided as a drawing on a separate plan sheet. Drawings should address the transition between phases.

a. Phase 1 – Initial Land Disturbance: This drawing shows BMPs to be installed prior to general clearing of the site. It should also show the existing contours, adjacent streets, ROW, easements and property lines. Do not show final contours on this drawing.
   i. Show the BMPs selected for the following:
      a) Downslope perimeter controls
      b) Side-slope controls as needed per site conditions
      c) Controls that will intercept runoff
      d) Access barriers for areas to remain undisturbed, such as ESA and tree protection fencing
   ii. Must show structures to be demolished and trees to be removed
   iii. If installing sediment-trapping impoundments, such as sediment basins or interceptor swales, they must be shown on this phase as they are installed at the initiation of grading.

b. Phase 2 – Construction and Stabilization: This phase shows BMPs required during the rest of grading and construction, such as inlet protection. It must also include BMPs appropriate for final stabilization; seeding, sodding, flatwork, etc.

   Individual Lot Phase: For multi-family development projects, the Phase 2 plan will also show behind-the-curb controls for individual lots, such as silt fencing, ground cover, and stabilized construction entrances.

3. For projects with earthwork construction totaling less than five (5) acres, phased erosion control plans are not required; the erosion control plan may be shown on a single sheet with the following:
   a. Show existing contours
   b. Show final contours
   c. Show direction of flow during grading operations with arrows

   Show areas to be permanently stabilized.

B. Mass-Graded Drainage Area Map

In addition to an existing conditions drainage area map (DAM) and proposed conditions DAM, sites with earthwork construction ten (10) acres or greater must provide a mass-graded DAM showing interim contours and temporary drainage conditions created by earthwork construction and soil-leveling activities.

1. General Mass-Graded Drainage Area Map Requirements
   a. Show the delineation and contributing drainage area of temporary basins; do not show any basins that drain to permanent stormwater infrastructure. Temporary basins can only flow to existing features.
   b. Show and label contours created by earthwork construction. Do not show precise grades such as building footprints, lot lines, or finished floor elevations.
   c. Show the direction of flow for each temporary basin using arrows.
   d. Show the locations of any existing basins.
   e. Show the locations of any temporary sediment-trapping impoundments (optional)
2. For Sites with Ten (10) Acres or More Common Drainage

a. Show and label the locations of any sediment-trapping impoundments, such as sediment basins or traps, or interceptor swales.

C. Sediment Basins

A sedimentation basin or similar sediment-trapping impoundment is required where 10 or more acres drain to a common area during any phase of development.

1. Sediment basins and other detention structures must provide storage volume for the runoff from a 2-year, 24-hour storm. Calculations must be included with the erosion control plan.
2. Sediment basin(s) or impoundments must provide at least 3,600 cubic feet (cu. ft.) of storage per acre drained until final stabilization of the contributing drainage area.
3. Sedimentation basins or impoundments must be designed by a Professional Engineer licensed in Texas or a Certified Professional in Erosion and Sediment Control (CPESC)
4. Sediment basins must be able to control and treat runoff within site boundaries; they should be installed as close as possible to the disturbed area or sediment source as possible. Existing detention or retention ponds at the site may not be appropriate, as determined by City review staff.
5. Sediment basins must be designed, constructed, and maintained to minimize mosquito breeding habitats by minimizing the creation of standing water. Outlet structures shall be designed to provide a minimum dewatering time of 36 hours and a maximum dewatering time of 72 hours.
6. When discharging from sedimentation basins and impoundments, the plan must utilize outlet structures that withdraw water from the surface. If this is infeasible, a reason must be provided to City review staff during planning.

D. Vegetation

1. Criteria for Stabilization

   You are required to stabilize exposed portions of your site in accordance with DDC § 7.3.5.E, the TXR150000 CGP, the NPDES CGP, and federal "C&D Rule" permit requirements as found in 40 CFR 450.21. To be considered adequately stabilized, you must meet the criteria below depending on the type of cover you are using, either vegetative or non-vegetative:

   a. Vegetative Stabilization: If you are vegetatively stabilizing any exposed portion of your site through the use of seed or planted vegetation, you must provide established uniform vegetation (e.g., evenly distributed without large bare areas), which provides 70 percent or more of the density of coverage that was provided by vegetation prior to commencing earth-disturbing activities.
      i. Immediately after seeding or planting the area to be vegetatively stabilized, to the extent necessary to prevent erosion on the seeded or planted area, you must select, design, and install non-vegetative erosion controls that provide cover (e.g., mulch, rolled erosion control products) to the area while vegetation is becoming established.
      ii. For final stabilization, vegetative cover must be perennial
   b. Deadline to Initiate Stabilization: You must initiate soil stabilization measures immediately whenever earth-disturbing activities have permanently or temporarily ceased on any portion of the site.

i. The term "immediately" means as soon as practicable, but no later than the end of the next workday, following the day when the earth-disturbing activities have temporarily or permanently ceased.

ii. Earth-disturbing activities have temporarily ceased when clearing, grading, and excavation within any area of the site that will not include permanent structures will not resume (i.e., the land will be idle) for a period of 14 or more calendar days, but such activities will resume in the future.

iii. The City closely adheres to the EPA's Construction General Permit and will consider any of the following types of activities to constitute the initiation of stabilization.

a) prepping the soil for vegetative or non-vegetative stabilization;
b) applying mulch or other non-vegetative product to the exposed area;
c) seeding or planting the exposed area;
d) starting any of the three activities stated just above on a portion of the area to be stabilized, but not on the entire area; and
e) finalizing arrangements to have stabilization product fully installed in compliance with the applicable deadline for completing stabilization

c. Deadline to Complete Stabilization Activities. As soon as practicable, but no later than 14 calendar days after the initiation of soil stabilization measures, you are required to have completed:

i. All activities necessary to initially seed or plant the area to be stabilized.

ii. You are required to have stabilized the exposed portions of your site prior to terminating permit coverage. You must submit your notice of termination (NOT) within 30 calendar days of completing earth-disturbing activities at your site.

2. Vegetative stabilization is required for all permanent and temporary channels and basins. Plant selection guidance is provided in the *i*SWM™ Landscape Technical Manual.

3. The erosion control plan must demonstrate reasonable preservation of trees and understory and that the following criteria is demonstrated in selection of trees to be preserved or removed:

a. Proximity of the trees critical root zone or drip line to proposed grading activity.

b. Permanent tree protection methods are employed to protect the preserved tree from damage where the trees critical root zone may be impacted.

c. Other measures have been employed, including site design that improves the chances for tree survival.

d. Temporary tree protection methods are adequately employed.

e. Construction methods for utility service to the site are used that allow protection and preservation of additional trees, such as, tunneling under the critical root zone, tree walls, or tree wells.

f. Utility trenching activities are indicated on the plan.

E. Structural Controls and Site Management Practices

1. Erosion and sediment control BMP design criteria shall adhere to the most current version of the *i*SWM™ Construction Controls Technical Manual, unless one of the following exceptions applies:

a. Linear projects may follow TxDOT standards; or

b. Proprietary erosion or sediment control devices may be utilized when:

i. Independent performance data is provided to prove a demonstrated capability of meeting a stormwater management efficiency equivalent to *i*SWM™ methods; and

ii. Supplementary data for systems or devices, such as instruction manuals and specification sheets, are provided and are demonstrated to be appropriate for use in North Central Texas site conditions, as determined by Environmental Services and Sustainability (ESS) department staff.

2. The City has restrictions on certain structural controls:

a. Curb inlet protection requires ESS approval to be used on active City streets

i. Organic filter tube curb inlet protection is prohibited

ii. Block and gravel filter curb inlet protection is prohibited

iii. Curb rock sock on-grade curb inlet protection is prohibited

F. Procedures During Construction

The Watershed Protection Division of the Environmental Services & Sustainability Department is primarily responsible for the inspection and enforcement of erosion and sedimentation control requirements on site developments and subdivisions. The City will monitor compliance with plan requirements and judge the effectiveness of the controls during different stages of construction and before and after significant rainfall. The criteria and procedures contained in this section closely adhere to DDC § 7.3.4-6, the TXR150000 CGP, the NPDES CGP, and federal permit requirements as found in 40 CFR 122.26 & 123.25.

1. Criteria for Approvals Required Prior to the Commencement of Land-Disturbing Activities

a. The project must have a valid, current city development permit or site plan.

b. The developer, owner, or otherwise delegated applicant shall complete the appropriate survey(s)

i. Applicants requiring a demolition permit must complete the Demolition Survey

ii. Applicants requiring all other permits must complete the Construction Survey

c. The applicant shall provide approved site plans and specifications for the development permit. For plans to be accepted, the locations and dimensions of all temporary and permanent erosion and sediment controls must be depicted. Specifications must include the maintenance routines, and schedules for installation and removal of controls, through all phases of construction.

d. If the project requires a Stormwater Pollution Prevention Plan (SWPPP), the plan must be reviewed for completeness by City staff.

i. The SWPPP must show consistency with City-approved plans (i.e. civil engineering plans and zoning compliance plans)

e. Projects disturbing five (5) or more acres must submit a Notice of Intent to the City; or when the project is part of a common plan of development with disturbed acreage totaling five acres or more.

f. Construction Site Notice (CSN)

i. Executed CSN(s) are included in the SWPPP.

ii. CSN(s) are posted publicly in locations near the site entrance, where they can be viewed by the general public.

2. Compliance Inspection by the City

a. The project must pass an initial inspection for approval of permits and/or Notice to Proceed.

i. The project must be in substantial compliance with the approved plans and specifications (ESCP) for the development permit

ii. Controls must be installed in all required areas, such as:

a) Perimeter controls
b) Stabilized construction exit
c) Protection of existing inlets

iii. Clearing for the installation of erosion control devices shall not exceed a width of eight (8) feet and must not encroach into the dripline or critical root zone of any tree to be protected.

b. The project will be routinely inspected during all phases of development to determine the compliance or non-compliance of a project's temporary erosion and sedimentation controls.

i. Erosion and sediment controls must be installed for current development phase.

ii. Sediment basins (when required) must be installed at the initiation of grading at the associated drainage area; the deadline for installation is seven days after initiation.

iii. Vegetative temporary stabilization measures must demonstrate consistent progress toward stabilization. See previous section for criteria.

iv. Permanent stabilization must be initiated within 48 hours of completion of construction activities on areas of the site and completed for project prior to issuance of final Certificate of Occupancy.

v. Vegetative stabilization must demonstrate consistent progress toward 70% density of perennial vegetative cover.

3. Reinspection

a. Reinspection is conducted for sites that are out of compliance.

i. Standard timeframe for corrections is seven (7) business days.

ii. Enforcement may be escalated if there are impacts to offsite property or waterways.

iii. A reinspection fee may be assessed.

b. Reinspection with Notice of Violation (NOV) will be issued for continued stormwater non-compliance affecting stormwater, with reinspection fee assessed.

c. Reinspection with Stop Work Order (SWO) – Escalation issued for continued non-compliance affecting stormwater through failed erosion and sediment controls. Reinspection fee assessed.

i. Effective until deficiencies are corrected.

ii. Erosion and sediment control failures which threaten life or property may result in SWO without prior reinspection or NOV.

d. Reinspection Fees

i. Applicability – applies only to reinspection due to failure to comply with site stormwater quality requirements.

ii. Amount – As established in the Water and Wastewater Rate Book.

iii. Time of Payment – Payment is due per standard City of Denton utility billing dates.

4.14 Stormwater Facility Maintenance Agreements

4.14.1 Maintenance Agreements

All drainage improvements constructed within a development and any existing or natural drainage systems shall require a maintenance agreement that identifies responsible parties for maintenance. The maintenance agreement shall be written such that it remains in force upon sale of transfer of the property.

As part of the Operations and Maintenance Plan submittal, a SWFMA must be prepared by the engineer of record for each stormwater control that will not be wholly maintained by the City. This agreement must outline preventive maintenance tasks and major repairs, identify the schedule for each task, assign clear roles to affected parties, and provide a maintenance checklist to guide future owners, including an annual self-inspection to be provided to the City. Multiple stormwater controls may be contained within a single Stormwater Facility Maintenance Agreement. When areas are identified for detention that also serve other purposes for the development (e.g. parking lots, loading docks) the requirement for a SWFMA may be waived.

4.14.2 Private Maintenance (SWFMA Required)

A. Private drainage facilities include those drainage improvements which are located on private property and which serve the needs of private development.

B. Private drainage facilities may also include detention or retention ponds, dams, and retaining walls intended to direct or contain runoff. Such facilities must be designed in accordance with sound engineering practices and reviewed and inspected by the City.

C. All SWFMA exhibits shall be reviewed and approved by the City with the civil engineering plans. The agreement for perpetual maintenance of private drainage facilities shall be executed with the City during per-construction. This agreement shall run with the land and can be tied to commercial property or to an owner's association, but not to individual residential lots.

D. The SWFMA shall provide the City with access to all private drainage facilities.

4.14.3 Maintenance Agreement Requirements

Details of the SWFMA must be set forth in a series of exhibits:

A. Exhibit A Legal Description - This includes the Metes and Bounds, a Surveyor's Drawing of the area occupied by the facility, and a copy of the preliminary or recorded plat containing the facility.

B. Exhibit B Design Plan and Specifications - These are summary documents intended for the use of future owners in conducting routine maintenance, inspections, and repairs. The documents include:

1. Design Data and Calculations - This can be in the form of a letter or statement from the engineer of record which summarizes critical design calculations related to the functionality of the facility, such as storage volume or TSS removal, and attests to the facility conforming to applicable *i*SWM standards;

2. Schematic Plan - This should be prepared by the engineer of record from construction drawings to show the general layout of the facility. Major features requiring regular or special maintenance should be shown and labeled in general terms understandable to a layman. A profile should be given showing critical elevations that control the function and capacity of the facility, and one or more cross-sections should be provided to indicate the general grading of the facility. A typical example of a schematic plan for a simple detention basin is shown in Figure 4.13 below; and

3. Landscaping - Vegetation should be shown consistent with the accepted Landscape Plan, either on the Schematic Plan or as a separate drawing.

C. Exhibit C Operations and Maintenance Plan - Specific maintenance tasks should be defined for each element of the facility. Maintenance tasks specific to the facility should be described in simple terms consistent with terminology contained in the Schematic and Landscape plans. An inspection and maintenance frequency should be established for each task.

D. Exhibit D Maintenance Checklist - A checklist consistent with the Operations and Maintenance Plan shall be provided for the use of future owners in performing routine and special maintenance tasks. This list should describe work required and frequency in language that is easy to understand and specific for the facility to be maintained. This form will be completed by the Owner and submitted to the City annually as part of a regular self-inspection program. *See* Appendix A for an example checklist for preparing a SWFMA for a simple detention basin.

Additional facility maintenance guidance for several types of stormwater controls is provided in the *iSWM Technical Manual*. The engineer of record must certify that the construction has been completed in accordance with the general plans and Schematic Plan. After approval of construction by the City, the engineer of record is expected to provide guidance to the owner's representative in implementing the accepted maintenance program and to co-sign the first annual inspection after the construction.

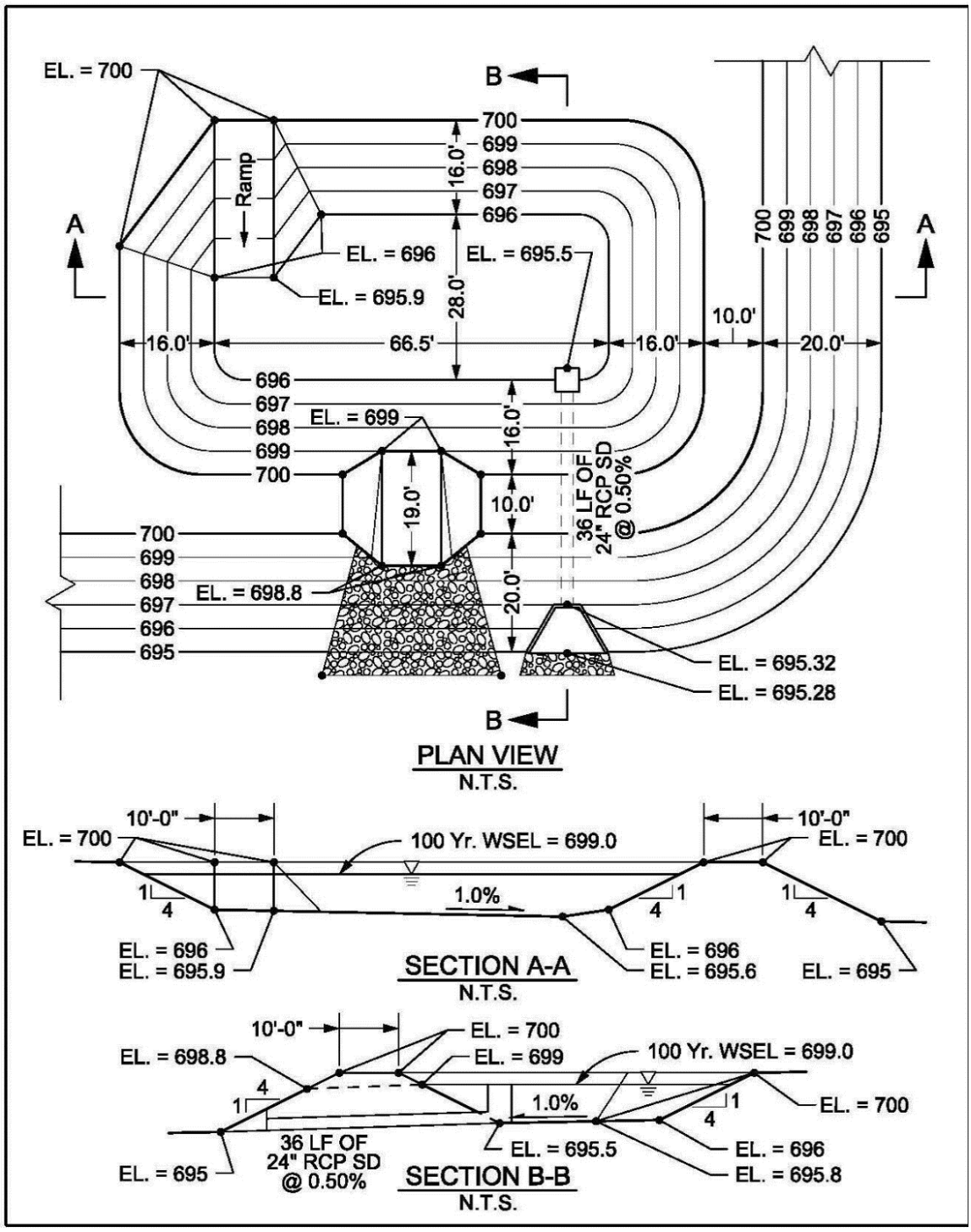


Figure 4.12 Simple Detention Basin Plan Schematic

Section 5: Transportation Design Criteria

5.1 Overview

The purpose of Section 5 – Transportation Design Criteria is to provide ***minimum guidelines*** for the design and construction of transportation infrastructure within the City of Denton, Texas and its extraterritorial jurisdictions using the complete street and context-sensitive solution approach. The goal is to create safer, more livable places that are consistent with their social, environmental and economic values.

It is the responsibility of the design engineer to ensure the final design of transportation infrastructure are in conformance with the most recently adopted versions of the following documents:

A. City of Denton Mobility Plan;

B. City of Denton Code of Ordinances, Chapter 18 – Motor Vehicles and Traffic, and Chapter 25 – Streets, Sidewalks and Public Places;

C. The North Central Texas Council of Governments (NCTCOG) Public Works Construction Standards;

D. DDC Subchapter 7.8 – Access and Circulation;

E. DDC Subchapter 7.9 – Parking and Loading;

F. DDC Subchapter 8.3 – Subdivision Design;

G. Americans with Disabilities Act (ADA) Standards for Accessible Design;

H. Public Right-of-Way Accessibility Guidelines (PROWAG);

I. The International Fire Code (IFC);

J. this Manual; and

K. relevant TxDOT, USDOT, NCHRP, FHWA, and AASHTO publications.

The criteria established in this Manual provide basic guidance for the design of transportation systems within the City of Denton. However, ***full responsibility and liability for proper design remains with the design engineer***. ***Users of this Manual should be knowledgeable and experienced in the theory and application of transportation engineering.***

Other design criteria may be warranted from applicable resources. The Federal Government, the State of Texas, NCTCOG, Denton County, Denton County Transit Authority (DCTA) and other related organizations and resources shall be consulted for additional criteria as may be deemed necessary. Along with this Design Manual, the DDC shall be consulted for additional guidance. The criteria established in this Manual do not supersede the policies contained in the DDC. Any revision to the DDC supersedes the criteria in this Manual.

5.1.1 Organization

Section 5 - Transportation Design Criteria is organized as follows:

A. Overview

B. Mobility Framework

C. Roadway Design

D. Intersection Design

E. Auxiliary Roadway Design

F. Access Management

G. Bike and Pedestrian Facility Design

H. Transit Facility Design

I. Traffic Impact Analysis Guidelines

J. Pavement Design Standard

K. Complete and Context-Sensitive Streets

5.2 Mobility Framework

The City of Denton Mobility Plan should be reviewed relative to any proposed development.

It should be noted that the City of Denton Mobility Plan is a living document and is periodically updated to reflect the changes in the characteristics of anticipated traffic flow within the City.

5.2.1 Roadway Functional Classifications

The City of Denton uses the following roadway functional classifications in guiding developments and street improvements within its jurisdiction. They are to be used in conjunction with other City of Denton documents, as well as Complete Streets, Vision Zero, and Context-Sensitive Design considerations. These classifications were established in the Thoroughfare Plan based upon expected fully developed traffic volumes.

A. Freeway

Freeways are high-capacity roadways intended to move large volumes of traffic through the region, into, and out of the City of Denton. They are typically managed and maintained by external agencies such as TxDOT and may include tolled or non-tolled facilities. Freeways are limited-access facilities as defined in Section 5.6 Access Management of this Manual.

These facilities are designed as multi-lane, high-speed roadways with on- and off-ramps to control access and support long-distance regional and interstate travel. In urban areas, freeways are often accompanied by frontage roads that provide access to adjacent properties and businesses.

This Manual does not prescribe specific design standards for freeways, as their planning, design, and construction fall under the jurisdiction of TxDOT or other applicable agencies.

B. Primary Arterial

Arterial streets are streets that serve major routes into and through the City of Denton. They are often multi-lane thoroughfares that generally include a landscaped median. Arterial streets are shown on the City Mobility Plan. These street types are to have limited access as defined in Section 5.6 Access Management section of this Manual.

Primary arterials provide regional connectivity between different areas of Denton County and the DFW region. The design of arterial can vary depending on the surrounding land use and development. In urban areas, arterials may have wider sidewalks with smaller building setbacks, while suburban areas may have limited sidewalks with a larger buffer between the edge of the street and the building fronts. Refer to City of Denton Standard Details T112A and T112C for typical cross-section requirements and design guidance.

C. Secondary Arterial

Secondary arterials provide shorter connections and carry less traffic. Secondary arterials are still significant to vehicular travel as they serve trips of moderate length and provide more land access. They have a greater role in balancing local land access with moving people and goods. Typically, they have lower travel speeds and traffic volumes than Primary arterials. They also tend to be limited in width by the built environment that they serve and often have the greatest need for accommodation of high levels of use for all travel modes. Refer to City of Denton Standard Details T110A and T110C for typical cross-section requirements and design guidance.

D. Major Collector Street

A major collector is a roadway that collects and distributes traffic between collector streets/ local streets and arterial roads, supporting moderate traffic volumes. It typically accommodates 2–4 lanes and operates at lower speeds. Major collectors balance mobility and access, featuring wider lanes, occasional medians, and turn lanes to improve flow. These roads often include sidewalks, bike lanes, or shared-use paths, making them suitable for moderate-distance trips between neighborhoods, schools, and commercial areas. Refer to City of Denton Standard Details T113A-T115A and T113C-T115C for typical cross-section requirements and design guidance.

E. Collector Street

A collector street is a street that collects associated traffic from residential streets, rural streets, commercial streets, or industrial streets as designated on the City Mobility Plan.

Collectors in the City of Denton provide local land access and traffic circulation from residential neighborhoods to arterials or major collectors. They typically experience lower traffic volumes and have lower design speeds. Collector classifications include the following:

1. Commercial Collector – Provides circulation between commercial developments and the arterial or major collector system. Refer to City of Denton Standard Details T108A and T108C for cross-section requirements and design guidance.
2. Residential Collector – Functions as a residential street but is designed to accommodate higher traffic volumes and wider pavement widths than standard residential streets. Parking may be permitted depending on the context and adjacent land uses. Refer to City of Denton Standard Details T107A and T107C for cross-section requirements and design guidance.

F. Local Streets

A local street is a public street that provides access to adjacent property and are usually contained within the neighborhood. These streets have low speeds and low volumes associated with them. Local streets may be further classified into the following two (2) types:

1. Residential Street – A residential street is a public street associated with residential development within an urban environment. The residential street may accommodate on-street parking, dependent on the context and adjacent land uses. Refer to City of Denton Standard Details T105A and T105C for cross-section requirements and design guidance.
2. Rural or Suburban Residential Street – A rural street is a public street that connects rural communities. Refer to City of Denton Standard Details T106A and T106C for cross-section requirements and design guidance.

Existing or new industrial developments on local streets shall consult with the City's Engineer.

5.2.2 Auxiliary Roadway Classifications

Roadways that cannot be classified as thoroughfare, are grouped together as auxiliary roadways and are classified here as follows:

A. Alleys

An alley (residential or commercial) is designed to provide access to the rear of or side of a lot including solid waste and fire access. These pathways are narrower than standard streets, usually measuring 20 feet wide ROW and are not intended for through traffic but rather for serving adjacent properties. Alleys will be required for residential streets prohibiting on-street parking. Alleys are required in non-residential zoning districts where necessary to provide for adequate access for service vehicles, off-street loading or unloading, access for emergency vehicles, fire access or similar reasons consistent with the intent of the DDC.

B. Drives

A drive is an unobstructed paved area providing vehicular access from a street to a developed property. Drives can be classified as follows:

1. Driveway - A driveway is located entirely on private property. It is only for a single-family or a duplex property. It connects a drive approach to a garage, carport, parking pad or the like.
2. Drive Aisle - A drive aisle is located entirely on private property. It is for every other condition other than for a single-family or a duplex property. It connects a drive approach to an area(s) that is to be accessed on the site such as, but not limited to: parking space(s); loading dock(s); loading area(s) (marked or implied - for passengers and/or goods); porte-cochere(s), and/or the like. It can also be a fire apparatus access road (in and of itself or in conjunction with other access use[s]). It can also be an access to an adjoining property (in and of itself or in conjunction with other access use[s]).
3. Drive Approach - A drive approach connects a street (city, public or private) or highway (TxDOT) with a drive aisle. Some features of the drive approach may extend into and be a part of the driveway or drive aisle. The drive approach is measured from the face of the roadway curb to the end of the curb return radius on the private property. The following provides the types of drive approaches considered within this Manual:
    a. Single-family residential: A drive approach to a single-family residential lot or one lot duplex.
    b. Multifamily residential: A drive approach to a multifamily lot such as triplexes, fourplexes, and multi-complexes. The drive approach can be either the main entrance approach or the secondary entrance approach. Each type has specific design requirements.
    c. Commercial: A drive approach to a commercial development. The drive approach can be either the main entrance approach or the secondary entrance approach. Each type has specific design requirements.
    d. Industrial: A drive approach to an industrial development. The drive approach can be either the main entrance approach or the secondary entrance approach. Each type has specific design requirements.
    e. Mixed-use approach: A drive approach that is a mixed-use development shall consider the more stringent criteria for the approach design.

4. Flag Drives - A flag drive is a private road within a private access easement, which may serve up to three (3) residential dwelling units. Flag drives shall have direct access to a public street other than an alley. They shall not, however, provide direct access to an arterial street.

C. Cul-De-Sacs, Dead-End Street, and Hammerhead Turnarounds

A cul-de-sac is a form of dead-end street that terminates with a circular or bulb-shaped turnaround, designed to accommodate fire apparatus and large vehicles for safe and efficient maneuvering.

A half cul-de-sac incorporates a 90° ± 5° bend, typically applied to residential or residential collector streets, and provides limited turnaround capability. In contrast, traditional dead-end streets share similar geometric characteristics with cul-de-sacs but terminate abruptly without a defined turnaround, restricting emergency access and vehicular circulation.

Hammerhead turnarounds are configured in a T-shaped or L-shaped layout at the end of a dead-end street, providing adequate space for large vehicles to complete a three-point turn. This option is commonly applied in constrained sites where a full cul-de-sac is not feasible.

To support overall street connectivity and circulation, the use of cul-de-sacs, dead-end streets and hammerhead turnarounds should be avoided if possible.

5.3 Roadway Design

5.3.1 Design Controls

Traffic volumes and speed are necessary for the design of roadways, and assist with the planning and design of ROW, number of lanes, turn-lanes, need of intersections, and bicycle and pedestrian facilities. Guidance on these design controls will be discussed at the pre-design meeting.

5.3.2 Street Sections

Street section standards are provided for arterial, collector, and local streets in **Error! Reference source not found.** below. Refer to the City of Denton Standard Details for cross-section details. Options for street sections are dependent upon treatment utilization within the street section. Besides defined lanes, other treatments that can be utilized within the street sections include on-street parking, bike lanes, multi-use paths, and transit facilities. The intent is to provide options in order to develop a "complete street" with "context-sensitive" design; *See* Section 5.11 of this Manual. ROW requirements may vary at intersections based upon turning movement requirements.

In general, street grades shall follow the natural contour of the property and be below the existing grade so that the parkway drains towards the street. Excessive cuts and fills solely for the purpose of balancing earthwork are not permitted.

Table 5.3-A : Geometric Roadway Standards

Criteria	Roadway Classification									
	FREEWAY	PRIMARY ARTERIAL	SECONDARY ARTERIAL	SECONDARY ARTERIAL (ONE-WAY)	MAJOR COLLECTOR	COMMERCIAL COLLECTOR	RESIDENTIAL COLLECTOR	RESIDENTIAL	RURAL OR SUBURBAN RESIDENTIAL	ALLEY [6,7]
No. of Lanes [1]	As per TxDOT standards	6	4	2-3	3-4	3	2-3	2	2	2
Min. ROW [10]		135′	110′	65′	110′	65′	65′	55′	65′	20′
Pavement Width [2] (BOC to BOC)		84′	62′	35′	48′-72′	39′	39′	33′	21′ [5]	15′ [5]
Median Width		14′	14′	NA	0′-14′	NA	NA	NA	NA	NA
Parkway Width		25.5′	24′	15′	18′-31′	13′	13′	11′	20′	NA
Min. Center Line Radius [3]		750′	575′	575′	575′	575′	400′	200′	200′	100′
Min. Horizontal Curve Separation		100′	100′	100′	100′	100′	100′	NA	NA	NA
Min. Grade (%)		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Max. Grade [4] (%)		7	7	7	7	7	7	10	10	8
Design Speed (MPH)		40-45	35-40	30-35	30-35	30-35	30	30	30	10-15
On-street Parking		Prohibited	Prohibited	Permitted [8]	Prohibited [9]	Prohibited	Permitted [8]	Permitted [8]	Prohibited	Prohibited

Notes:
[1] The number of travel lanes is dependent upon TIA and/or the City's Engineer's requirements.
[2] See Table 5.4-D, Table 5.4-E, Table 5.4-F, and Table 5.4-G**Error! Reference source not found.**, for additional ROW requirements at intersections with turn lanes.
[3] The Minimum center line radius is based on the cross slope of -2% (no superelevation).
[4] The maximum grade within 60 feet of an intersection measured from the intersection curb is 2% or less.
[5] Measurement is edge-of-pavement to edge-of-pavement.
[6] If an alley is to be used for waste collection, it must meet all alleyway access requirements shown in Section 3: Solid Waste Design Criteria of this Manual.
[7] If an alley is intended to provide fire apparatus access, it must meet the design requirements of Section 5.6.3- Fire Apparatus Access Roads of this Manual.
[8] Parking is allowed unless otherwise prohibited by ordinance or by signs installed by the city.
[9] Parking is prohibited unless otherwise allowed by ordinance or by the City's Engineer, in which case only parallel parking is permitted.
[10] The developer shall dedicate from one-half of the required ROW, measured from the centerline of the existing street alignment, up to the full width of the required ROW for City-maintained facilities, in accordance with the City of Denton Mobility Plan.
[11] A 20-ft wide public utility easement is required along the property frontage where the property abuts a TxDOT-maintained roadway.
[12] The applicable standards, cross-sections, and design requirements shall be determined in coordination with the City Transportation Department.

5.4 Intersection Design

Several components of intersection design are addressed in this section. These standards are to work in concert with the Traffic Impact Analysis (TIA) requirements of this Manual. Additionally, the Pedestrian and Bicycle Facility Design, Transit Facility Design, and the City of Denton Standard drawings for accessibility should be reviewed for additional design requirements.

5.4.1 Geometry

A. Street intersections should be designed to be perpendicular; *see* tolerances shown in Table 5.4-A below. All streets shall be aligned with any existing streets by continuation of the centerline thereof.

B. The staggering of street alignment resulting in "T" intersections shall leave a minimum distance of 150 feet between the curb faces of residential streets, and 200 feet between the curb faces of collector streets.

C. Table 5.4-A and Figure 5.1 below provide requirements for ROW corner clips and curb return radius at intersections. These standards provide minimum vision clearance areas without consideration to stopping sight distance. Additional sight clearance evaluation should be performed as necessary, as per Section 5.4.3 below.

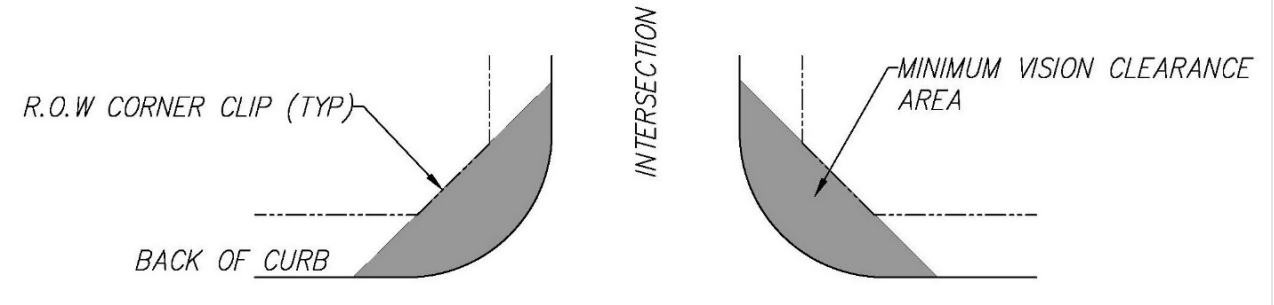


Figure 5.1 Minimum Vision Clearance

Table 5.4-A: Intersection Geometry

Intersection Classification	Intersection Angle (degrees)	ROW Corner Clip [1] (feet)	Curb Return Radius (feet)
Arterial - Arterial	90±5	30	30
Collector - Arterial	90±5	20	30
Collector - Collector	90±5	15	30
Residential Street - Arterial	90±5	15	30
Residential Street - Collector	90±10	15	20
Residential Street - Residential Street	90±10	10	20
Flag Drive - Collector	90±10	5	20
Flag Drive - Residential Street	90±15	5	10
Alley - Collector	90±10	10	30
Alley - Residential Street	90±10	15	30
Alley - Alley	90±10	25	30

Notes:
[1] Shall apply to all corners of the intersection.
[2] Fences must provide a 5-ft. corner clip adjacent to driveways.
[3] Curb Return Radius is for single lane design. Multi-lane and special considerations for truck-turning radius require turn radius analysis, as required by the City's Engineer.
[4] Major Collector shall follow the arterial street standard.

5.4.2 Visibility Standards

Table 5.4-B and Figure 5.2 below shall be used to evaluate the required unobstructed view for motorists at intersections, which are based upon the design speed approaching the intersection. Design speeds are based upon the roadway classification. The values shown in the table are minimum standards. Within the sight line area, no obstruction shall be allowed that will obstruct the view of motorists. A sight visibility easement shall be dedicated to protect and maintain sight visibility.

A. Table 5.4-B below is based upon passenger car right turn and left turn from stop. Where truck traffic warrants additional sight distance, refer to AASHTO Geometric Design of Highways and Streets for single-unit truck and combination truck design requirements, Case B1 and Case B2.

B. Refer to AASHTO Geometric Design of Highways and Streets for multi-lane considerations and other design considerations that may apply for Cases "A" through "F".

C. Lines of sight distance at all intersections shall be clear at an elevation between two (2) feet and nine (9) feet above the nearest gutter elevation.

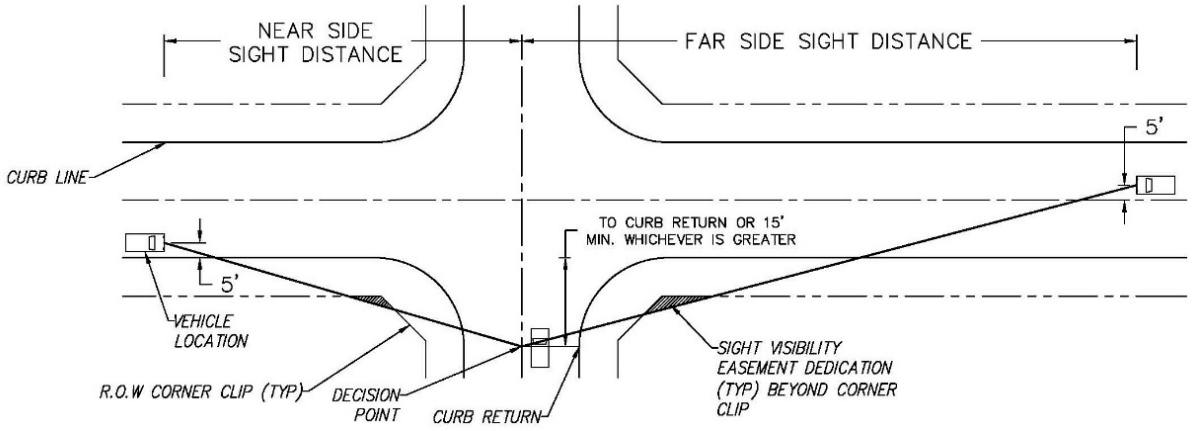


Figure 5.2 Visibility Standards

Table 5.4-B: Visibility Standards

Design Speed (mph)	Intersection Sight Distance Near Side (feet)	Intersection Sight Distance Far Side (feet)
30	290	335
35	335	390
40	385	445
45	430	500

Notes:
[1] Driveways accessing roadways shall use above table to satisfy intersection visibility compliance.

5.4.3 Vertical Curve Standards

Vertical curves are required when two (2) street grades intersect at a point of vertical intersection greater than 1%. Minimum vertical lengths for both crests or sags shall be defined by the design speed for the street and the associated stopping sight distance, as well as the minimum K value. Table 5.4-C below shows the minimum K value for various design speeds.

Table 5.4-C: Minimum 'K' Values for Vertical Curves

Design Speed (mph)	Stopping Sight Distance (feet)	Crest Vertical Curve (K Min)	SAG Vertical Curve (K Min)
30	200	19	37
35	250	29	49
40	305	44	64
45	360	61	79

Notes:
[1] Source: AASHTO Geometric Design of Highways and Streets 'US Greenbook'.

Vertical curve lengths can be calculated as shown in Equation 5.1 below:

$$L = KA \qquad \textbf{[Eqn. 5.1]}$$

Where: L = Vertical Curve Length

A = Algebraic Difference in Grade

A. No vertical curve required for "A" equal to or less than 1.0%

B. Minimum spacing between successive vertical curves shall be 50 feet for residential, and 100 feet for collectors and arterials.

C. Resultant vertical curve grade shall be no less than 0.3% for concrete pavement, and no less than 0.5% for asphalt pavement.

D. For drainage purposes, 50-ft. vertical curves are required when "A" is greater than 1.0% and less than or equal to 1.2%. Otherwise minimum vertical curve length is 100 feet.

5.4.4 Turn Lane Requirements

Turning lane requirements shall be based upon the following requirements and/or the requirements of the City's Engineer, and the tables within this section.

A. Left-Turn Lane Warrants

When designing an intersection that provides direct or indirect access to the proposed development, left-turn lanes should be provided at driveways and street intersections along major arterial and collector roads, wherever left turns are permitted. Traffic-volume-based guidelines for where left-turn lanes should be provided are presented in Tables 5.4-D (four-lane roadways) and 5.4-E (two-lane roadways) below.

Table 5.4-D: Left-Turn Warrants for Four-Lane Roadways [1] *Source: AASHTO A Policy on Geometric Design of Highways and Streets*		
Left-Turn Lane Peak-Hour Volume (veh/hr)	**Three-Leg Intersection, Major-Road Peak-Hour Volume (veh/hr/ln) that Warrants a Left-Turn Lane**	**Four-Leg Intersection, Major-Road Peak-Hour Volume (veh/hr/ln) that Warrants a Left-Turn Lane**
5	450	50
10	300	50
15	250	50
20	200	50
25	200	50
30	150	50
35	150	50
40	150	50
45	150	<50
50 or More	100	<50

Notes:
[1] These guidelines apply where the major road is uncontrolled, and the minor-road approaches are stop- or yield-controlled. Both the left-turn peak-hour volume and the major-road volume warrants should be met as shown in Figure 5.X.
[2] Major road volume shall be calculated as the total traffic volume from both approaches of the major roadway, divided by the total number of through lanes on those approaches.

Table 5.4-E: Left-Turn Warrants for Two-Lane Roadways [1] *Source: AASHTO A Policy on Geometric Design of Highways and Streets*		
Left-Turn Lane Peak-Hour Volume (veh/hr)	**Three-Leg Intersection, Major-Road Peak-Hour Volume (veh/hr/ln) that Warrants a Left-Turn Lane**	**Four-Leg Intersection, Major-Road Peak-Hour Volume (veh/hr/ln) that Warrants a Left-Turn Lane**
5	200	150
10	100	50
15	100	50
20 or more	50	< 50

Notes:
[1] These guidelines apply where the major road is uncontrolled, and the minor-road approaches are stop- or yield-controlled. Both the left-turn peak-hour volume and the major-road volume warrants should be met.
[2] Major road volume shall be calculated as the total traffic volume from both approaches of the major roadway, divided by the total number of through lanes on those approaches.
[3] Bypass lanes warrant analysis at three-leg rural intersections shall follow the TxDOT Roadway Design Manual.

Figure 5.3 below guides the left-turn lane design plan. Conditions for requesting a left-turn lane include large truck volume, high crash history, limited sight distance, and significant delay for motorists to make the turn, as determined by the City's Engineer. Further discussion and examples of left-turn lane guidance can be found in AASHTO's Policy on Geometric Design of Highways and Streets.

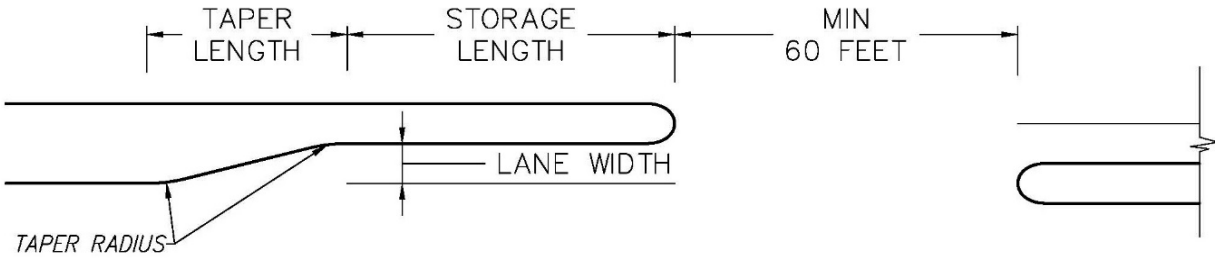


Figure 5.3 Left-Turn Lane

B. Right-Turn Lane Warrants

When designing an intersection that provides direct or indirect access to the proposed development, right-turn lanes should be provided along major arterial and collector roads at driveways when the right turns are permitted and satisfy the following criteria. Table 5.4- G below provides criteria which warrant right-turn lanes. Figure 5.4 below provides guidance on right-turn lane requirements.

Table 5.4-F: Right-Turn Warrants for Urban and Suburban Roadways

Roadway Classification	Speed Limit (mph)	Volume (Vehicles per Hour)
Arterial / Collector	45 or greater	50 or more
Arterial / Collector	Less than 45	60 or more

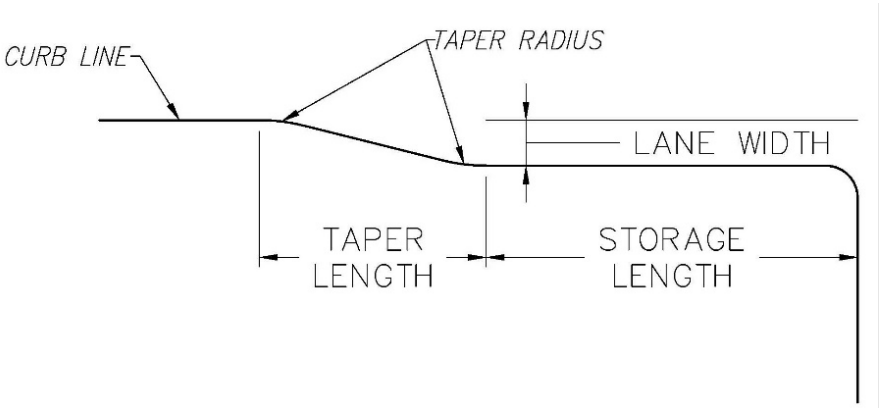


Figure 5.4 Right-Turn Lane

Conditions for requesting an exclusive right-turn lane when right-turn traffic volume projections are less than indicated in Table 5.4- G, include the following, as determined by the City's Engineer:

1. Large volume of truck traffic,
2. High crash history,
3. Roadways with limited sight distance, or
4. Heavier than normal peak flow movements on the main roadway.

C. Turn Lane Geometry

When a turn lane is required, Table 5.4- H below shall be used as the minimum criteria for the turn

lane geometry. Additional consideration shall be given for unique traffic movements such as excessive tractor trailer utilization, extended length transport vehicle movement, etc. *See* Section 5.4.5 below for additional geometry standards for Collectors and Arterials.

Table 5.4-G: Minimum Turn Lane Geometry

Intersection Type	Lane Width (feet)	Minimum Storage Length (feet)	Minimum Taper (feet)		Additional ROW Required (feet)
			LEFT TURN	RIGHT TURN	
Residential Collector	11	100	100	100	15
Major/Commercial/Industrial Collector	11	150	100	150	15
Secondary Arterial	11	150	100	200	15
Primary Arterial	11	200	100	200	15

Notes:
[1] Required turn lane storage may be greater depending upon the TIA.
[2] The Pedestrian Path shall be taken into account for access across the median by utilizing a leave-out or ramp in accordance with accessibility standards described in this manual.
[3] Cross slope of median openings or turn bays shall not be more than 2% or less than 1%.
[4] On TxDOT Roadways, TxDOT Roadway Design Manual standards shall supersede City of Denton Standards.
[5] Taper Radius shall be 200 feet minimum.
[6] Additional ROW required per turn lane bay, if ROW is not sufficient.

5.4.5 Intersection Detail for Collectors and Arterials

Figure 5.5 below provides median location details and specific turn lane radius requirements. Also refer to median details shown in the City of Denton Standard Details.

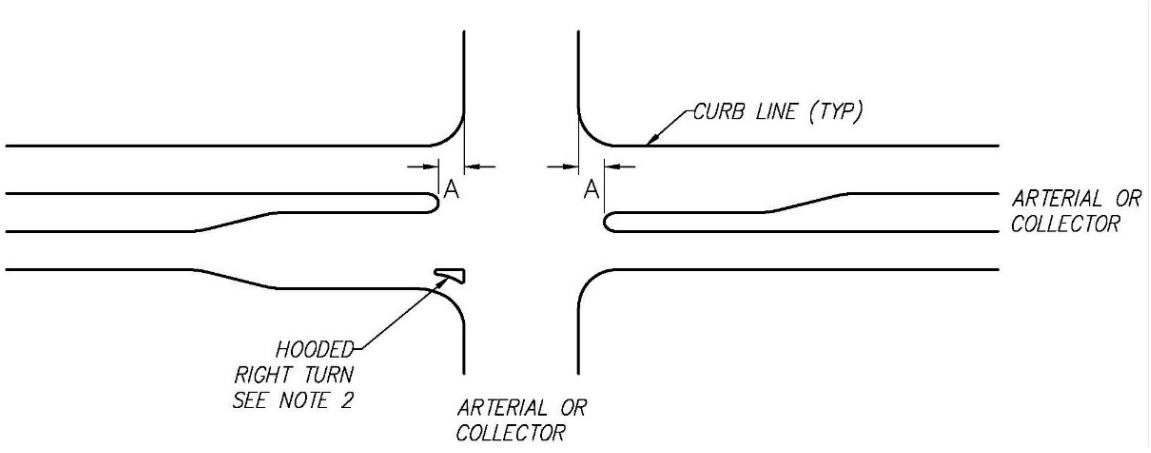


Figure 5.5 Intersection Detail for Collectors and Arterials

Notes:
1. For collector and arterial streets, A = 15 feet minimum.
2. Depending upon traffic flow requirements, the right turn may require a hooded right turn.

5.4.6 Intersection Spacing

Standards for intersection spacing are outlined below in Table 5.4- H.

Table 5.4-H: Minimum Intersection Spacing [1]

Roadway Classification	Alley	Flag Drive	Residential	Collector	Arterial
Alley	100 feet	N/A	100 feet	100 feet	N/A
Flag drive	N/A	N/A	75 feet	75 feet	N/A
Residential	100 feet	75 feet	200 feet [2]	200 feet [2]	400 feet
Collector	100 feet	75 feet	200 feet [2]	200 feet [2]	400 feet
Arterial	N/A	N/A	400 feet	400 feet	1200 feet

Notes:
[1] Spacing will be measured between face of the curbs.
[2] 100-ft. minimum to the first intersection for entrances to subdivisions off of an arterial, where lots back up to the arterial.

5.4.7 Roundabouts

Roundabouts are circular intersections that create counter-clockwise traffic movements around a central island, with entering traffic yielding to circulating traffic.

The design of a roundabout shall be in compliance with the Intersection Control Evaluation provided by the FHWA. Normally, each roundabout will be unique in some way, as such a standard roundabout is not included in this Manual. Also, the various analyses and design considerations involved in roundabout design are beyond the scope of this Manual.

A. The following resources shall be used when designing a roundabout:
   1. TxDOT Roadway Design Manual
   2. NCHRP Report 1043: Guide for Roundabouts (2023)
   3. Federal Highway Administration Roundabouts, An Information Guide
   4. Federal Highway Administration Roundabouts, Technical Summary

B. In addition to the resources provided above, the roundabout design shall include the following design review process with the City's Engineer and City Staff:
   1. Have a Pre-Application Conference on the project, which will include a separate meeting with the City's Engineer for proposed roundabout design considerations;
   2. Have a Traffic Impact Analysis (TIA) review meeting with the City's Engineer. *See* section on TIA requirements;
   3. Develop Preliminary layout of roundabout considering TIA and Pre-Development meetings;
   4. Preliminary Design review meeting with the City's Engineer;
   5. Develop roundabout design based up comments from the City's Engineer; and
   6. Submit roundabout design through the Development Review Process (DRP).

5.5 Auxiliary Roadway Design

5.5.1 Alleys

A. Alleys shall have at least two (2) direct access points to public streets and are subject to the block length criteria included in this Manual.

B. Alleys shall be a minimum of 15 feet wide, with edges sloping towards the centerline at 3% slope.

C. No drainage infrastructure will be allowed within the alley ROW. Alleys shall be designed to convey all runoff along the surface of the pavement.

D. Alleys that are intended to provide fire apparatus access must meet the design requirements of Section 5.6.3-Fire Apparatus Access Roads of this Manual.

E. Refer to City of Denton Standard Detail T103C for further details.

5.5.2 Drives

The design criteria for drives detailed in this section should be utilized in conjunction with the standards outlined in DDC 8.3 (Lot Planning). The following standards generally apply to all developments. However, there may be unique situations for which these standards may be impractical. In these situations, the City's Engineer will work with the developer to develop a mutually agreeable solution. In the event that a mutually agreeable solution is not reached, the developer may apply to the Planning and Zoning Commission for consideration of the issue.

A. Drive Approach Standards

Table 5.5-A: Drive Approach Dimensions

Development Type [1]	Drive Approach Widths		Radius
	MIN. WIDTH (FEET)	MAX. WIDTH [2] (FEET)	(FEET)
Residential – Single-family or Duplex	12	20	5 [3]
Residential – Multifamily	24	38	10 to 20
Commercial or Industrial [4]	30	38	20 to 25

Notes:
[1] Driveways on TxDOT roadways - driveway width and curb radius shall meet TxDOT Roadway Design Manual standards.
[2] Refer to Figures 5.6 through 5.10.
[3] If the drive approach is part of the fire apparatus access road, refer to Section 5.6.3 of this manual.
[4] Maximum drive approach width is a function of traffic volume.
[5] Add five (5) feet to maximum radius for significant truck traffic.
[6] For shared drive approaches, no lot shall contain less than nine (9) feet of the drive approach and driveway or drive aisle (as may apply). Drive approach shall be centered on lot line, such that maximum drive approach width equals 30 feet.

1. Residential

   a. One (1) single-family or one (1) duplex residential lot accessing a collector may be permitted to have one (1) full-width or circular drive approach (Figure 5.6 below), when alleys are not practical.

   b. Two (2) adjacent single-family or two (2) adjacent duplex residential lots accessing a

collector may be permitted to have one (1) shared full-width or circular drive approach, when alleys are not practical.

c. Three (3) or more contiguous single-family or three (3) or more contiguous duplex residential lots accessing a collector will be required to enter the collector by an alley, flag drive, or residential street.

d. One (1) single-family or one (1) duplex residential lot accessing an arterial, will be required to have an on-site facility, allowing entrance into the arterial in a forward manner.

e. For homes with a 3-car garage or greater, where the garage door is street-facing and less than 40 feet from the back of curb, the maximum drive approach width shall be 30 feet.

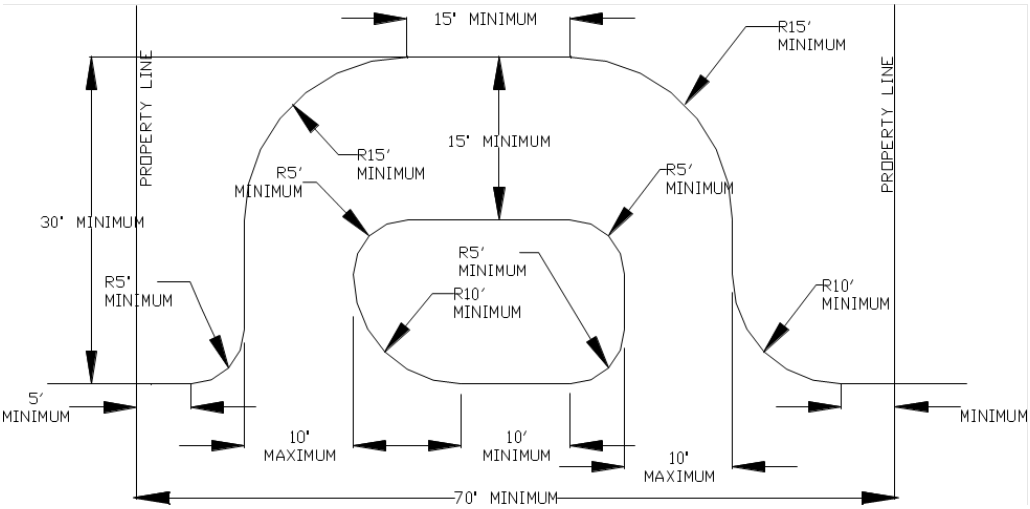


Figure 5.6 Residential Circular Drives

2. Commercial

a. All stop bar markings and stop signs when used shall be on private property, as well as upstream of any pedestrian facility crossing the drive approach and/or drive aisle.

b. All signs and markings should be consistent with TMUTCD.

c. Drive approaches with significant truck traffic may install surmountable curb with textured and colored pavement in the parkway, with a depth equal to or greater than the drive approach pavement requirement.

d. Ingress/Egress Lanes

i. Single Lane Egress/Ingress (Figure 5.7) - The outbound (towards the street) lane shall be a minimum of 12 feet wide; if the width of the driveway is greater than 30 feet, then the inbound (onto the site) lane shall be a minimum of 18 feet wide.

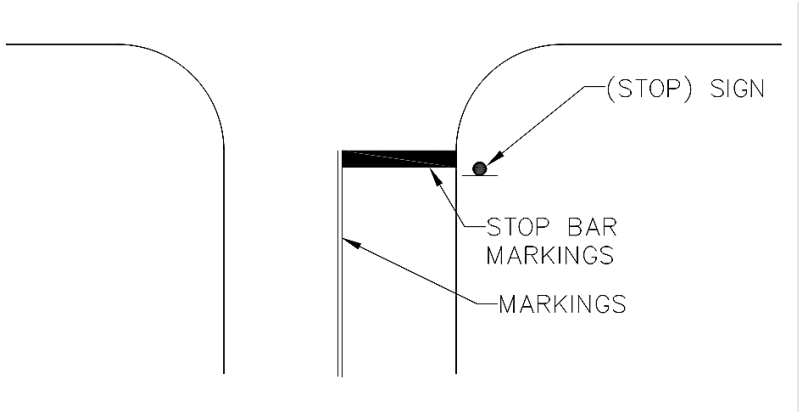


Figure 5.7 Drive Approach: Single Lane Egress/Ingress

ii. Dual Lane Egress, Single Lane Ingress (Figure 5.8) - The outbound lanes shall be 10 feet wide; if the width of the driveway is greater than 30 feet, then outbound lanes shall remain 10 feet wide while the width of the inbound lane shall be increased.

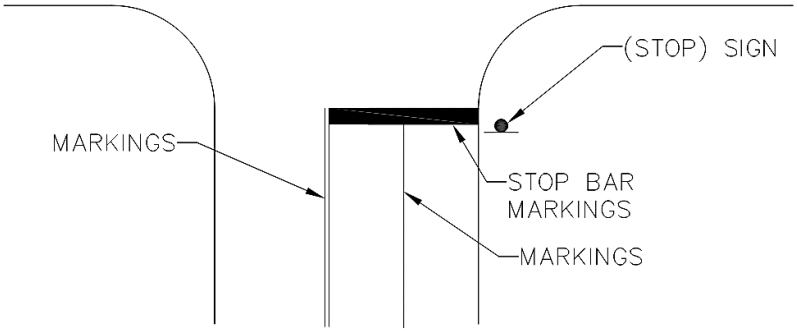


Figure 5.8 Drive Approach – Dual Lane Egress, Single Lane Ingress

iii. Multiple Lane Egress/Ingress (Figure 5.9) - Only allowed when dual left-turn lanes into the site or opposing street/driveway has two (2) or more lanes, of which two (2) are designated as being through lanes.

d) Each of the two (2) outbound and inbound lanes shall be 10 to 12 feet wide.
e) Median shall accommodate any pedestrian facility across the drive approach and/or drive aisle, as projected from both sides thereof.

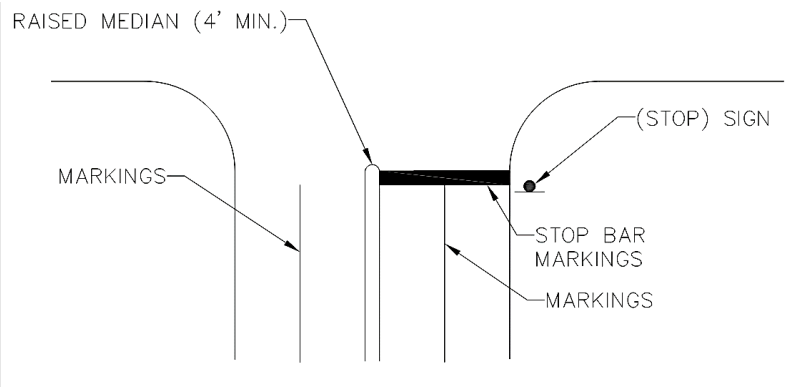


Figure 5.9 Drive Approach – Multiple Lane Egress/Ingress

iv. Right-in or Right-out Egress/Ingress - The minimum width of the drive approach/drive aisle prior to the island, each lane (inbound and outbound) at the island, and the applicable radii shall be determined by the engineer of record, based on expected vehicle type(s), as well as an auto-turn analysis provided to the City's Engineer for review and approval as part of the Civil Engineering Plan submittal.

a) Median/island shall accommodate any pedestrian facility across the drive approach and/or drive aisle as projected from both sides thereof.
b) For "one way in" or "one way out" driveways, the geometry shall be as shown in Figure 5.10 below for the respective side.
c) Through a Design Deviation request, the minimum drive approach width may be reduced based upon acceptable turning radius for emergency vehicles, and determination that truck traffic requiring the larger width will not occur.
d) When the right in/right out drive approach is part of the fire apparatus access road, the minimum width of each drive shall be 24 feet.

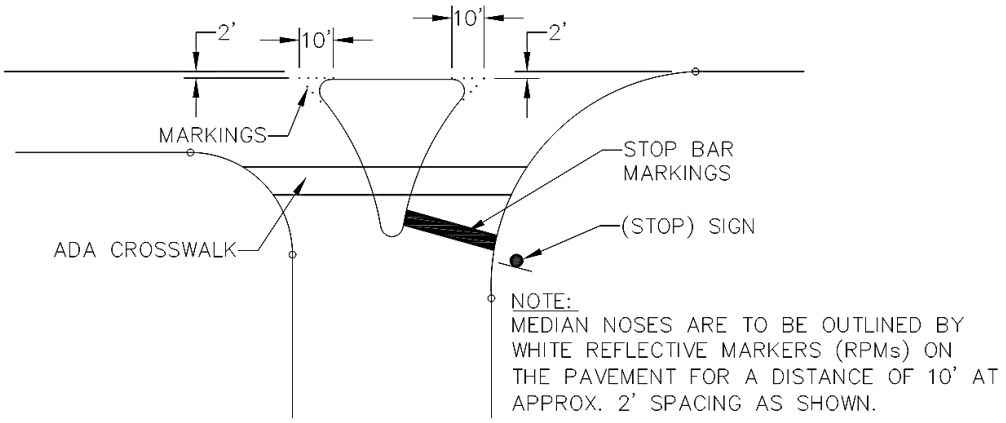


Figure 5.10 Drive Approach – Right in or Right out Egress/Ingress

v. With the exception of multi-lane egress/ingress (shown in Figure 5.9), drive approaches with a median installed in lieu of the double-yellow marking, may exceed the maximum drive approach width by the width of the median only.

vi. Right-in/right-out driveways along TxDOT frontage roads may be designed without a porkchop unless the driveway is in close proximity to exit and entrance ramps. A regular driveway approach with one-way signs is acceptable

B. Drive Approach Spacing

1. Same side of the street

Drive approach spacing shown in Table 5.5-B below applies to drive approaches on the same side of the street, and is measured between the nearest edges of each drive approach, along the back of curb, not including the radius.

Table 5.5-B: Minimum Drive Approach Spacing

Roadway Classification	Min. Spacing [1] (feet)
Primary Arterial	200 [2]
Secondary Arterial	150 [2]
Major Collector/Collector	100 [3]
Residential Street [4]	50
Flag Drive	10
Alley	10

Notes:
[1] Driveways on TxDOT roadways must meet the minimum spacing in the TxDOT Access Management Manual, Table 2-2.
[2] A maximum of two (2) drive approaches permitted. If a second point of access is required by City Fire Code official, it must be remote, meaning driveways are spaced no less than half the diagonal of the maximum overall dimension of the lot.
[3] If permitted; drive approaches are not permitted on arterial streets, unless otherwise allowed according to Section 5.6 of this Manual.
[4] If permitted; refer to Section 5.6 of this Manual for permitted access.
[5] For a T-intersection on residential streets, the drive approach shall be offset farthest from the intersection.
[6] Single-family driveways on residential streets require a minimum spacing of 10 ft.

2. Near Intersections

Drive Approach spacing shown in Table 5.5-C below applies to drive approaches near intersections and is measured between the face of the curb of the intersecting street and the nearest edge (face of curb) of the drive approach not including the drive approach radius; *see* Figure 5.11 below.

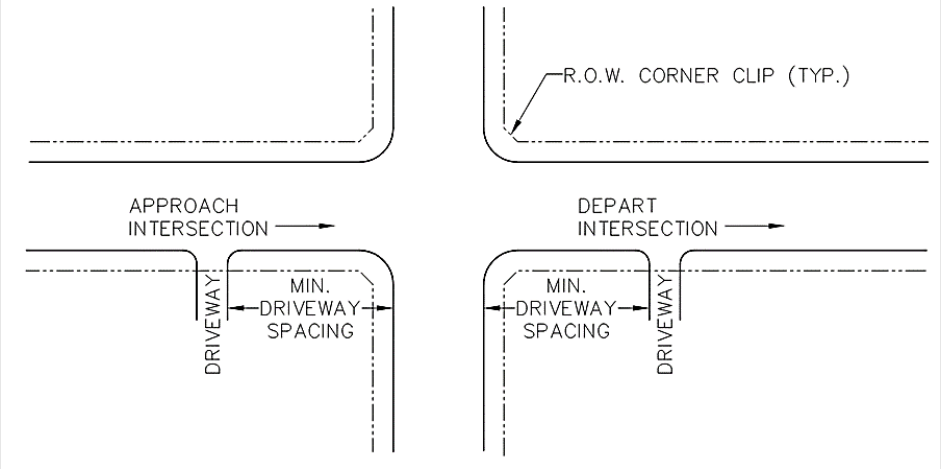


Figure 5.11 Drive Approach Spacing at Intersections

Table 5.5-C: Minimum Drive Approach Spacing at Intersections

Intersection Type	Approaching the Intersection	Departing the Intersection
Arterial - Arterial [1]	150 feet on both streets	200 feet on both streets
Collector - Arterial [1]	75 feet on collector, 150 feet on arterial	100 feet on collector, 200 feet on arterial
Collector - Collector	75 feet on both streets	100 feet on both streets
Residential - Arterial [1]	50 feet on residential, 150 feet on arterial	50 feet on residential, 200 feet on arterial
Residential - Collector	50 feet on residential, 75 on feet collector	50 feet on residential, 100 feet on collector
Residential - Residential [2]	50 feet on both streets	50 feet on both streets
Flag Drive - Collector [1]	20 feet on flag drive, 75 feet on collector	20 feet on flag drive, 100 feet on collector
Flag Drive - Residential [1]	20 feet on flag drive, 50 feet on residential	20 feet on flag drive, 50 feet on residential
Alley - Collector [1]	20 feet on alley, 75 feet on collector	20 feet on alley, 100 feet on collector
Alley - Residential [1]	20 feet on alley, 50 feet on residential	20 feet on alley, 50 feet on residential
Alley - Alley	10 feet on both alleys	10 feet on both alleys

Notes:
[1] If permitted by the City's Engineer.
[2] Driveways across T-intersections on residential streets are exempt.

3. Offset and relative to median openings (See Figures 5.12 and 5.13 below)

   a. For collector streets, drive approaches that do not align across the street from each other must be offset by a minimum of 75 feet between nearest tangent-edge to nearest tangent-edge.

   b. For arterial streets without medians, drive approaches must align across the street from each other, and must be approved by the City's Engineer. When this is not physically possible or practical as determined by the City's Engineer, drive approaches that do not align must be offset across the street from each other by a minimum of 150 feet between nearest tangent-edge to nearest tangent-edge.

   c. For arterial streets with medians, drive approaches must align with existing or proposed

median openings. Where this is not possible or practical as determined by the City's Engineer, drive approaches must be placed as far away from the existing or proposed median opening as is reasonably possible.

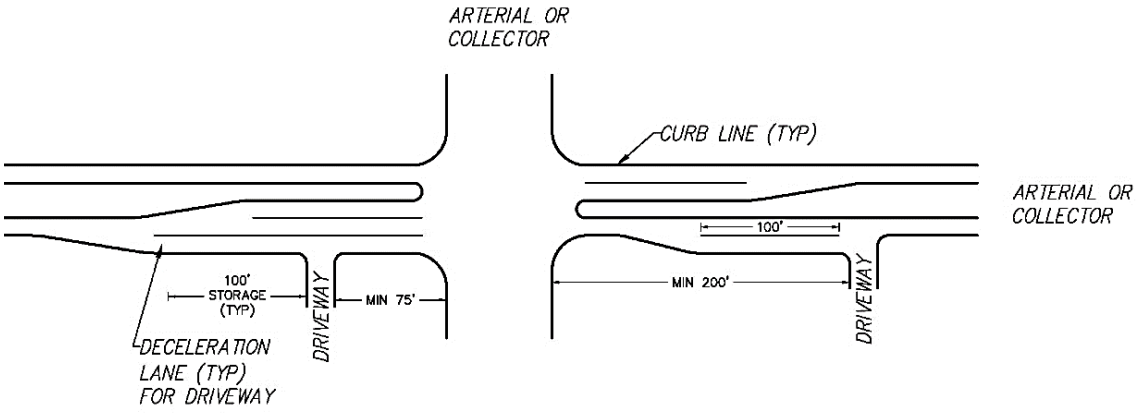


Figure 5.12 Drive Approach Near Turning Movements

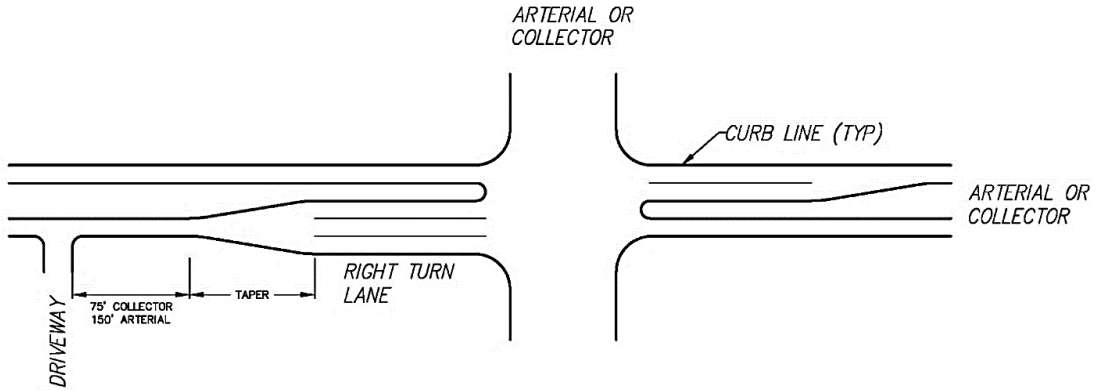


Figure 5.13 Drive Approach Near Turning Movements

C. Drive Approach Grades

1. Minimum Drive Approach Slope:

   The minimum drive approach slope shall be determined by:

   $$S = (6 + [0.02 \times W \times 12]) / (W \times 12) \quad \textbf{[Eqn. 5.2]}$$

   Where: W = the width of the parkway in feet as shown on the City of Denton Standard Details.

2. Maximum Drive Approach Slope: Unless otherwise approved by the City's Engineer through a design deviation request (Section 9), the maximum drive approach slope shall be 12%.

3. Difference in Drive Approach Grade: Driveway profiles shall not have a grade difference greater than 5%, without constructing a vertical curve. A minimum K-value of 4 is recommended for driveways accommodating low ground clearance or long wheelbase vehicles.

4. Sidewalks in Drive Approach: Maximum sidewalk cross slope within the limits of the drive approach shall be 2%.

5. Sidewalk Easement Requirement: Where the parkway width is insufficient to provide appropriate drive approach slope, a sidewalk easement will be required, equal to the balance of the sidewalk width needed outside the ROW plus two (2) feet. The additional two (2) feet requirement is for sidewalk installation and maintenance. The balance of the sidewalk width needed is based upon using the minimum drive approach slope calculated in Section 5.5.2.C.1 above. *See* Figure 5.14 below as well as City of Denton Standard Details.

6. Driveway/Drive Aisle Consideration: The drive approach slope from the bottom of the gutter to the nearest edge of the sidewalk (within the limits of the ROW) shall not exceed the driveway/drive aisle slope beginning at the furthermost edge of the sidewalk. Also, it shall not be less than the minimum slope, nor be greater than the maximum slope as noted herein.

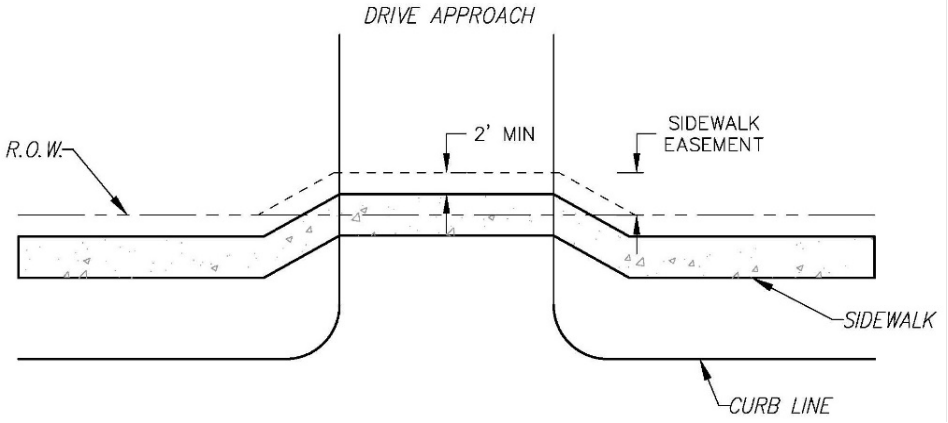


Figure 5.14 Sidewalk Easement to meet Drive Approach Slope

D. Driveway Throat Length Requirements

1. Minimum throat length requirements are shown in Table 5.5-D below. Note that throat length requirement applies to both edges of the drive approach.

2. All drive approaches that access an arterial shall be classified as a primary drive approach. If no drive approaches access an arterial, then the drive approach expected to receive the most traffic is considered to be the primary drive approach.

3. The throat length is measured between the first parking space or drive aisle and the curb line, whichever is closer to the curb line.

4. Parking lots with 10 or less parking spaces may use a minimum throat length of 10 feet for drive approaches accessing a residential or collector street.

5. For gated entries, a minimum storage of 100 feet must be provided from the travel lane face of the curb with an area for turnaround.

6. A queuing analysis shall be required for gated entrances and drive-throughs.

Table 5.5-D: Minimum Throat Length		
No. of Parking Spaces	**Min. Throat Length for Primary Drive Aisle (feet)**	**Min. Throat Length for Secondary Drive Aisle (feet)**
0 to 100	20	20
101 to 250	40	20
251 to 500	60	40
501 to 1000	80	60
1001 and above	Queuing Analysis Required	Queuing Analysis Required

E. Driveway Separation

Driveways shall be separated in accordance with Table 5.5-B to ensure that all driveways are separated by sufficient distance so as to avoid interfering with the safe movement of traffic. In interpreting and applying the separation requirements, the following shall apply:

1. The separation requirements shall be determined in reference to any proposed or existing driveways on or off the property. Where applied to a property, which is located adjacent to an undeveloped tract, the separation requirements shall account for the placement of future driveways on the adjacent undeveloped property.

2. The minimum separation specified may be reduced for currently developed property, if the amount of street frontage for the property is insufficient to allow for one (1) driveway access that would have the necessary separation from an existing driveway on adjacent property, and joint access with adjacent properties is not physically possible, as determined by the City's Engineer. If a reduction in the minimum separation specified is allowed, the separation shall be reduced only to the degree necessary to allow for the single driveway.

F. Corner Clearance Standards

Corner clearance standards shall be applied in accordance with AASHTO "Green book" to ensure that the traffic movements from driveways do not unduly conflict with the movement of traffic on intersecting public streets. In interpreting and applying the corner clearance standards, the following shall apply:

1. A reduced requirement may only be used if absolutely necessary to provide driveway access to property where no other means of access meeting the corner clearance requirement is reasonably possible, and joint access with adjacent properties is not physically possible as determined by the City's Engineer. If a reduction in the minimum corner clearance specified is allowed, the corner clearance shall be reduced only to the degree necessary to allow for the single driveway.

2. The specified distances shall be measured at the ROW line from the edge of the driveway nearest the intersecting street to the ROW line of the intersecting street. Where ROW corner clips exist or are proposed, the specified distance shall be measured from the edge of the driveway nearest the intersecting street and the end of the corner clip nearest to the subject driveway.

G. Modifications to Existing Drives

Existing non-compliant drives may be modified to comply with criteria set forth in this Manual, but may not be modified in a way that increases the non-compliance with this Manual.

H. TxDOT Drives

All drives connecting to TxDOT roadways shall meet all required TxDOT standards, in addition to meeting City of Denton standards when applicable.

5.5.3 Cul-de-sacs

A. Geometrical Standards

1. Maximum length of a Cul-de-sac shall be 600 feet measured from the centerline of the intersecting street to the Cul-de-sac radius point, and perpendicular to the intersecting street centerline.
2. Minimum length of a Cul-de-sac shall meet Fire Code requirements.
3. Residential Cul-de-sacs shall not have more than 29 residential lots.
4. The center radius of the Cul-de-sac shall be a minimum of 50 feet for residential developments, and 60 feet for commercial and industrial developments measured from the center point to the face of curb or edge of pavement where there is no curb.
5. The Cul-de-sac return radius shall be 30 feet.
6. Cul-de-sac minimum street grades shall be as shown below in Figure 5.15 and Figure 5.16 below for downward gradient and upward gradient, respectively.

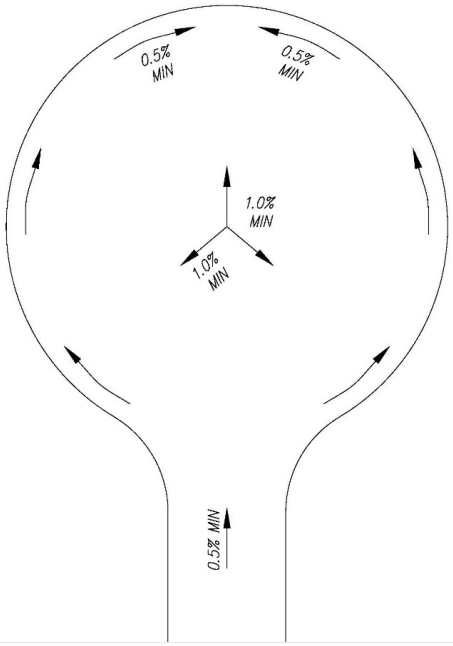


Figure 5.15 Cul-de-sac Minimum Slope - Downward Gradient

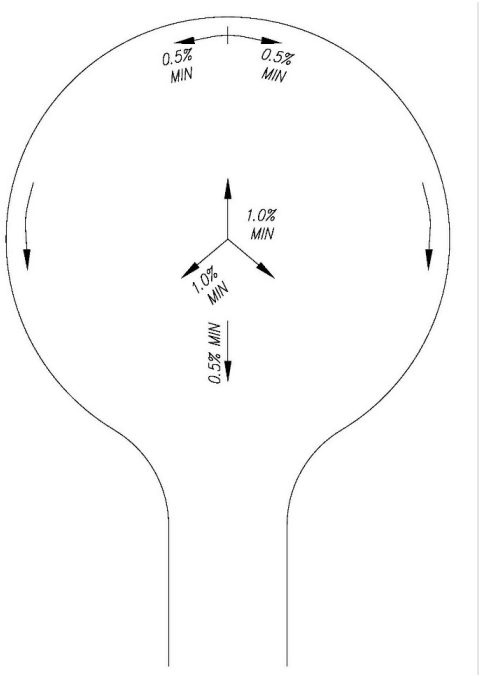


Figure 5.16 Cul-de-sac Minimum Slope - Upward Gradient

B. Offset Cul-de-sacs

1. Offset Cul-de-sacs shall have the same radius and return radius as the standard Cul-de-sac.
2. The length of the offset Cul-de-sac shall be measured from the centerline of the intersecting street to the Cul-de-sac radius point, perpendicular to the intersecting street centerline.

C. Temporary Turn-Around

1. A temporary turn-around shall be limited to approved phase developments where the street will be extended in the future.
2. A temporary turn-around shall meet the requirements of a standard Cul-de-sac for radius and return radius size.
3. The length of street associated with the turn-around shall not be any greater than 600 feet nor less than Fire Code requirements.
4. If the length of street will be greater than 600 feet, then the next block length of street and intersecting streets shall be constructed in order to provide looped traffic flow for emergency vehicles.
5. The turn-around section shall be constructed to the same structural section as the street section less curb and gutter requirements, unless drainage requirements warrant curb and gutter.

5.5.4 Hammerhead Turnarounds

A. The legs of the hammerhead (forming the "T" shape) should be at least 60 feet in length, measured from the centerline of the intersecting roadway.

B. The turnaround must be constructed to support heavy vehicles and meet all width and corner radius

standards required for emergency access.

C. No parking or obstructions are allowed within the hammerhead area to ensure full access for emergency vehicles.

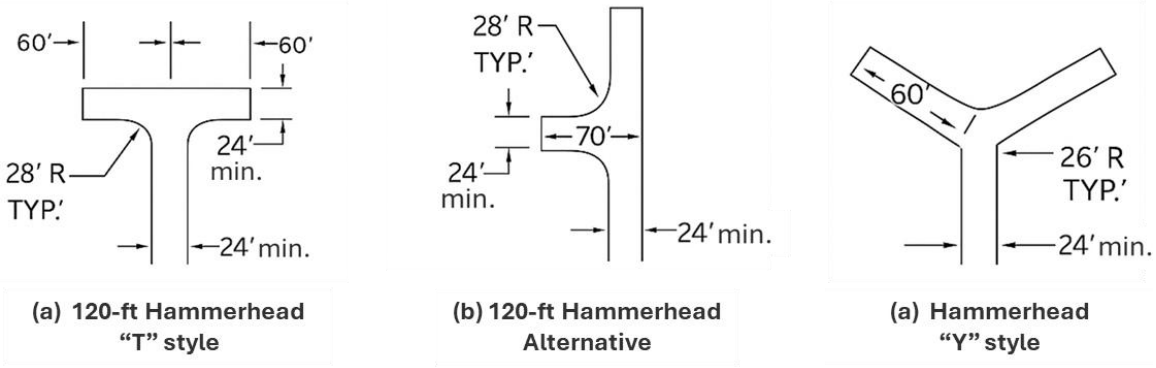


Figure 5.17 Hammerhead Turnarounds

5.5.5 Supplementary Design Elements

A. Signage and striping

Signage and pavement markings shall be as shown in the Texas Manual on Uniform Traffic Control Devices (TMUTCD).

1. New subdivisions must include STOP signs on minor street approaches and All-Way STOP control (AWSC) where long stretches of Residential, Collector, and Arterial intersections. (Determined by the reviewer or City's Engineer) . The City's Engineer must approve AWSC signs.
2. Midblock crossings are discouraged; where it's inevitable, it must have LED- Crosswalk Signs, Ped warning, Ped crossing signs, Rectangular Rapid-Flashing Beacons (RRFBs), Pedestrian Hybrid Beacons (PHBs), or other active crossing signs as directed by the City's Engineer.
3. Crosswalk Markings - Continental style – Two (2) feet wide by 10 feet long white thermoplastic
    a. Crosswalks shall only be installed if there are Barrier-Free Ramps (BFRs) on both ends of the road.
    b. Crosswalks are required only on Collectors and above, not on residential, local streets, or alleys.
4. 'STOP' Bars – 24 inches white thermoplastic located 2 inches from the crosswalk or aligned with 'STOP' signs.

B. On-street Parking

Consistent with the requirements of Public Rights of Way Accessibility Guidelines (PROWAG), the following Americans with Disabilities Act (ADA) on-street parking requirements shall be followed:

1. General
    a. On-street parking is permitted for residential and residential collector streets, unless prohibited by the City's Engineer.

b. On-street parking should be parallel, while angled and perpendicular parking requires approval from the City's Engineer.

c. On-street parking for proposed commercial/industrial collectors or arterials is not allowed. Where on-street parking is designated, one (1) on-street parking space for each single-family unit on a block is required on the frontage street within that block.

d. Areas in front of a driveway, within five (5) feet of a driveway, within 20 feet of a street intersection, or within 15 feet of a fire hydrant shall not be counted toward the required on-street parking.

2. Parallel Parking

a. For parallel parking spaces where the adjacent sidewalk or available ROW is more than 14 feet wide, an access aisle must be provided at street level for the entire length of each accessible parallel parking space.

b. The access aisle must be a minimum of five (5) feet wide and connect to a pedestrian access route.

c. The access aisle must not encroach on the vehicular travel lane and must comply with the technical requirements for surfaces.

d. In alterations where the street or sidewalk adjacent to the parking spaces is not altered, an access aisle is not required, provided the parking spaces are located at the end of the block face.

e. Where the adjacent sidewalk or available ROW is less than or equal to 14 feet wide, an access aisle is not required, but accessible parallel parking spaces must be located at the end of the block face.

Figure 5.18 shows the acceptable parking configuration for on-street parallel parking.

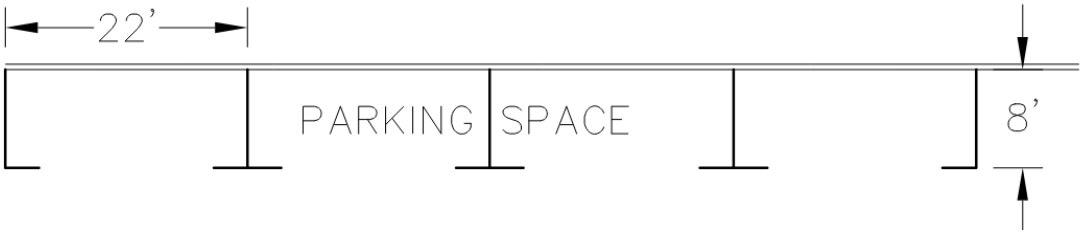


Figure 5.18 Parallel Parking

3. Perpendicular and Angled Parking

a. For perpendicular and angled parking spaces, an access aisle must be provided at street level for the entire length of each accessible perpendicular or angled parking space.

b. The access aisle must be a minimum of eight (8) feet wide to accommodate vans with lifts and connect to a pedestrian access route.

c. Two (2) accessible parking spaces are permitted to share a common access aisle.

d. The access aisle must be marked to discourage parking in the aisle and comply with the technical requirements for surfaces.

Figures 5.19 through 5.22 show the acceptable parking configurations for on-street angled parking.

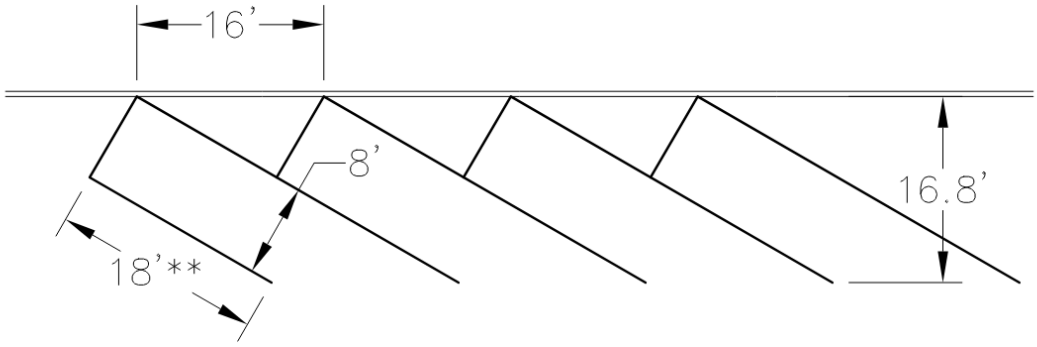


Figure 5.19 Angled Parking – 30 degrees

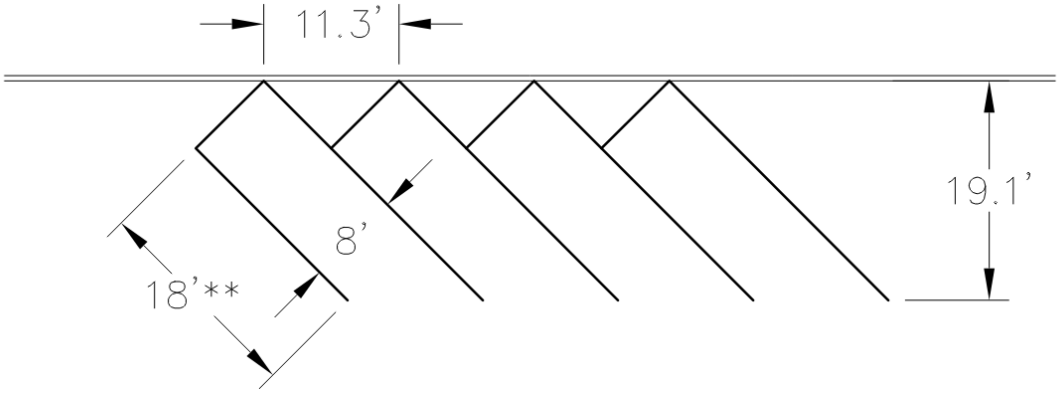


Figure 5.20 Angled Parking - 45 degrees

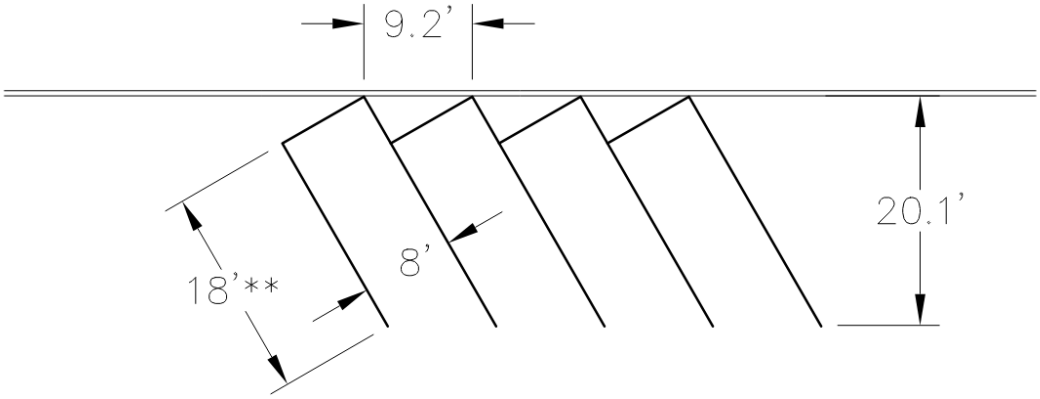


Figure 5.21 Angled Parking - 60 degrees

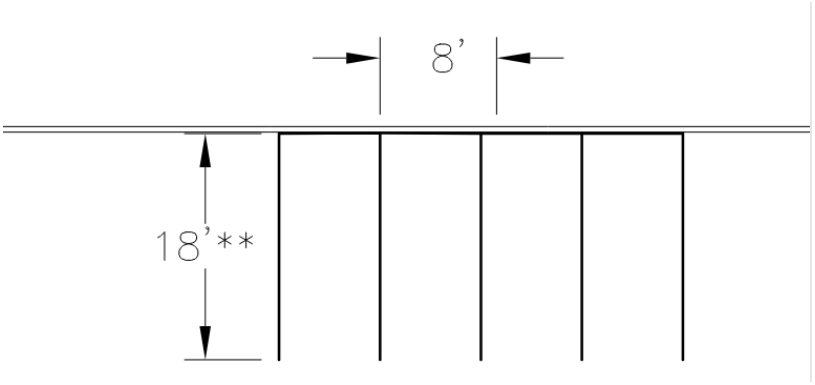


Figure 5.22 Angled Parking - 90 degrees

4. Curb Ramps and Blended Transitions
    a. Curb ramps and blended transitions must connect the access aisle serving each accessible on-street parking space to the pedestrian access route.
    b. Curb ramps are not permitted within the access aisle.
    c. Parking spaces at the end of block face can be served by curb ramps or blended transitions at the pedestrian street crossing.
    d. Detectable warning surfaces are not required on curb ramps and blended transitions that connect the access aisle to the sidewalk, including where the sidewalk is at the same level as the parking spaces, unless the curb ramps and blended transitions also serve pedestrian street crossings.
5. Other
    a. Wheel stops will be required to prevent vehicle overhang into adjacent property, ROW, structures, landscaping or sidewalk (applicable to '**' shown on above figures).
    b. Parking spaces may be reduced to 16.5 feet in length if a two (2) feet overhang is provided.
    c. All standard parking space striping shall be white in color.
    d. On-street motorcycle parking space is half the size of a vehicle parking space.

C. Median Openings

Median openings for collectors and arterials shall be as designated by the City's Engineer. Median opening allowance shall primarily consider the safety and effective flow of traffic within the collector or arterial street, then secondarily consider the effective movement of traffic to and from the development. Whether a median opening is allowed will solely be up to the City's Engineer.

When a development is allowed to have a median opening, it shall be provided in accordance with the following criteria:

1. The width of a median opening shall be 60 feet.
2. Median openings shall center on the intersecting drive.
3. Median openings shall be a minimum of 400 feet apart, measured from nose-to-nose of medians.

4. Whenever a median opening is constructed, the associated left-turn lane serving the development must be constructed at the same time. In the event that there is an existing intersecting street on the opposite side of the street, the new development constructing the median opening shall be required to install both left-turn lanes.
5. Patterned and colored median noses shall be constructed as shown on the City of Denton Standard Details.
6. For any proposed median opening on TxDOT-maintained facilities, the standards outlined in the TxDOT Roadway Design Manual shall be followed.

D. Traffic Calming

1. General Policy
   a. Traffic calming measures intended to control vehicle speeds within the public ROW are generally not permitted.
   b. Exceptions may be considered in critical areas where documented overspeeding presents a safety hazard - such as in front of schools, hospitals, parks, or other pedestrian-sensitive environments.
   c. Any installation within the public ROW must be supported by an engineering study that documents operating speeds exceeding the posted limit and must receive approval by the City Fire Code Official, ensuring compliance with the most current provisions of the IFC adopted by the City.
2. Prohibited vs. Conditional Devices
   a. Prohibited Devices:
      i. Speed humps, bumps, and other similar vertical deflection devices are prohibited on both public ROW and private property fire apparatus access roads.

         These devices have been shown to delay emergency response times by approximately 10 seconds per device and have been associated with damage to fire and EMS vehicle frames as well as injuries to emergency personnel during response operations. For these reasons, they are not permitted within the City.
   b. Conditional Devices:
      i. Speed cushions or segmented devices designed to allow emergency vehicle clearance may be considered on private property only. These devices require City Fire Code Official approval and must conform to current IFC standards and applicable AASHTO/ITE traffic calming guidance.
      ii. Horizontal traffic calming devices (including but not limited to chokers, chicanes, traffic circles, and similar geometric modifications) may be considered on a case-by-case basis within both public ROW and private property; however, their implementation must be reviewed and approved by both the City's Engineer and the City Fire Code Official.
3. Design & Installation Standards
   a. All traffic calming devices must include signage and pavement markings in compliance with the most recent TMUTCD edition, where applicable.
   b. Additional ROW dedication may be required to accommodate traffic calming devices while maintaining minimum lane widths, drainage, and pedestrian or bicycle access.

c. Devices must be constructed of durable materials (e.g., pre-molded rubber, modular plastic, or reinforced concrete) to ensure long-term performance and maintain emergency response accessibility.

4. Permitting Requirements

A separate permit is required to install any speed control device within a designated fire apparatus access road.

5.6 Access Management

5.6.1 Purpose and Goals

The purpose of the access management plan is to promote the health, safety, and general welfare of the present and future residents of the city through managing traffic flow and promoting traffic safety. In planning and designing access for proposed developments, the following documents should be utilized in conjunction with this section:

A. DDC Section 7.8.9 – Driveways and Access

B. DDC Section 7.8.10 – Cross-Access Between Abutting Developments

C. TxDOT Access Management Manual (if proposed access connects TxDOT-maintained facilities)

D. TxDOT Roadway Design Manual (if proposed access connects TxDOT-maintained facilities)

These standards collectively ensure safe, efficient, and coordinated access within the city's roadway network.

5.6.2 Access Standards

A. Compliance

1. No person shall construct, reconstruct, replace, relocate, alter, enlarge, improve or perform any work on or make use of any driveway for any property within the City or its extraterritorial jurisdiction, except in accordance with the Access Management standards provided in this Manual or the TxDOT Access Management Manual, when applicable.

2. All driveways shall be designed, installed, located, and constructed in accordance with the approved specifications, plans, conditions, and requirements of the permit issued for the property, and the requirements of this Manual.

3. No certificate of occupancy shall be issued for any building on any property for which a permit is required, until the construction, improvements, alterations or other work covered by the permit is completed in accordance with the permit issued, the requirements of this Manual, or the provisions of any other applicable ordinance.

4. Where no building permit was required in connection with the requested permit, no driveway on the property for which the permit was issued shall be used until and unless the work is completed in accordance with the permit, and this Manual.

B. Access to Freeways

Direct access from private property to freeway main lanes is prohibited; access is provided exclusively at designated interchanges and ramps. Access to adjacent frontage roads must comply with the TxDOT Access Management Manual and are , subject to the following provisions:

1. Control of Access:

   Access is prohibited in areas where TxDOT has established Control of Access. Control of Access areas are documented on current TxDOT ROW maps.

2. Direct Ramp Access:

   a. Ramps with Frontage Roads: Direct access from adjacent properties or streets is strictly prohibited for the entire length of the ramp.

   b. Interstate Ramps without Frontage Roads or Interstate Interchange Connectors: Direct access is prohibited along the full length of the ramp or connector in accordance with 23 CFR 625.3 and 625.4.

   c. Non-Interstate Facilities without Frontage Roads: Direct access is strongly discouraged. If allowed, the location must be determined based on spacing criteria and procedures outlined in this Manual and the TxDOT Access Management Manual.

3. Frontage Road Considerations:

   Direct access to frontage roads is prohibited in the vicinity of ramp connections to ensure safe merging, weaving, and adequate acceleration and deceleration of vehicles.

4. Ramp Proximity Restrictions:

   a. Exit Ramps: No access shall be permitted within the paved gore area or within 250 feet downstream of the painted gore of an exit ramp.

   b. Entrance Ramps: No access shall be permitted within the paved gore area or within 200 feet upstream of the painted gore of an entrance ramp.

   c. For further guidance, refer to the TxDOT Roadway Design Manual.

5. Design Considerations:

   The spacing of interchanges and ramps shall provide adequate distance for entering and exiting vehicles to safely accelerate, decelerate, and weave, consistent with TxDOT design standards.

C. Access to Arterial Streets

Access to an arterial street shall not be permitted unless there is no other reasonable means of providing safe access to the property. Unless designated as a freeway, all TxDOT Highways shall be considered arterials. Additionally, the geometric, hydraulic, and pavement designs of all access driveways to TxDOT roadways must be reviewed by TxDOT to ensure compliance with their standards.

1. No development shall be allowed access to an arterial street if property excluded from the development could have been used to provide reasonable access to a lesser classified street, or if the property has been previously subdivided in violation of state law or the DDC and if access could have been provided to a lesser street except for such unapproved subdivision of the property.

2. Existing commercial or industrial lots created prior to adoption of the DDC by legal subdivision procedures with exclusive frontage on an arterial street may take access to the arterial in accordance with the access standards in this Manual.

3. Existing single-family and duplex lots created prior to adoption of the DDC by legal subdivision procedures with exclusive frontage on an arterial street may be developed with

a circular drive. Such drives shall be designed and constructed in accordance with standards for circular drives provided in this Manual.

4. When drives access to an arterial street is the only reasonable means of providing safe and adequate access to the property as determined by the City's Engineer, the drive design, number of drives, location and construction shall be in accordance with this Manual.

5. Drives on an arterial shall align with existing median openings, other driveways, and "T" intersections, or be offset in accordance with this Manual.

D. Access to Collector Streets

1. Access to collector streets for commercial, office, or industrial development is required and shall be designed and constructed in accordance with the standards provided in this Manual.

2. Single-family or duplex lots shall not be designed such that there is no other means of access other than a collector street.

3. Existing single-family and duplex lots developed prior to approval of the DDC with exclusive frontage on a collector street and no alley may be developed with a circular drive. Such drives shall be designed and constructed in accordance with the standards for circular drives provided in this Manual.

4. Drives on a collector street shall align with existing driveways and 'T' intersections on the opposite side of the street, or shall be offset in accordance with this Manual.

5.6.3 Fire Apparatus Access Roads

A. Design Standards

The design of all fire apparatus access roads shall be submitted to the Fire Department for review and shall not be constructed without prior authorization from the City Fire Code Official.

1. Fire apparatus access roads shall be constructed in accordance with the City of Denton standards for the concrete pavement cross-section of a residential street.

2. They shall be designed for all-weather use and capable of supporting fire apparatus with a load rating of up to 75,000 pounds.

3. Width, Clearance, and Setback

   a. Minimum unobstructed width of 24 feet for buildings up to 30 feet in height, and 26 feet for buildings over 30 feet in height.

   b. Minimum vertical clearance of 14 feet.

   c. Setback from the building face shall be a minimum of 15 feet and maximum of 30 feet.

4. Fire apparatus access roads must have a minimum inside turning radius of 25 feet, and a minimum outside turning radius of 45 feet.

   a. Driveways less than 24 feet wide may have a minimum inside turning radius of 28 feet.

   b. Driveways wider than 26 feet may have a minimum inside turning radius of 20 feet.

5. Maximum grade for fire apparatus access roads shall not exceed 10%.

6. Proximity to Buildings

   Fire apparatus access roads shall be located so that all parts of the building are accessible within 150 feet, measured along the hose lay from the lane.

For buildings fully equipped with an approved automatic fire suppression system, this distance may be increased to 300 feet upon approval of the City Fire Code Official.

7. Dead-End Lanes must provide an IFC-approved turnaround if the dead-end exceeds 150 feet in length (IFC Appendix D). Refer to Sections 5.5.3 and 5.5.4 of this manual for further details regarding turnarounds.

8. Traffic Calming - No speed bumps or similar traffic calming devices are permitted in fire apparatus access roads (IFC 503.4.1).

B. Modification of Existing Fire Apparatus Access Roads

Modification of existing fire apparatus access roads MUST be approved by the Fire Marshal's Office.

C. Marking

1. Striping

Fire apparatus access roads shall be marked by painting 6-in. wide red traffic lines at its boundaries, as indicated on the plat. The words "NO PARKING FIRE LANE" or "FIRE LANE NO PARKING" shall be four (4) inches high.

2. Signage

Signs shall read "NO PARKING FIRE LANE" or "FIRE LANE NO PARKING" and shall be 12-in. wide and 18-in. high. Signs shall be painted on a white background with letters and borders in red, using not less than 2-in. high lettering. Signs shall be permanently affixed to a stationary post, and the bottom of the sign shall be six (6) feet and six (6) inches or 6'-6" above finished grade. Signs shall not be spaced more than 50 feet apart. Signs may be installed on permanent buildings or walls, as approved by the Fire Marshal.

5.7 Bike and Pedestrian Facility Design

The user should be aware of and utilize the DDC Section 7.8.11 Pedestrian and Bicycle Circulation, in conjunction with this section for the design of bike and pedestrian facilities.

5.7.1 Mobility Plan Component

The City of Denton Mobility Plan includes a pedestrian and bicycle component, which should be reviewed, relative to any proposed transportation improvement.

It should be noted that the City of Denton Mobility Plan is a living document and is periodically updated to reflect the changes in the characteristics of anticipated traffic flow within the City.

5.7.2 Accessibility Standards

The City of Denton considers sidewalks to be accessible routes according to Section 4.3 of Texas Accessibility Standards (TAS) and considers a public sidewalk a “facility”. Sidewalks, landings, ramps, and flares shall comply with the most recently adopted TAS, ADA, PROWAG, and FHWA standards. Also, sidewalks, landings, ramps, and flares are subject to the requirements of the Texas Department of Licensing and Registration (TDLR) for inspection purposes. Prior to construction of sidewalks, the Engineer of Record must show proof of TDLR review and approval for accessibility, if the total cost of the public improvements will exceed $50,000.00. Compliance with the regulations shall be the responsibility of the Engineer of Record for the project. Refer to the City of Denton Standard Details for additional requirements.

5.7.3 Geometric Standards

Table 5.7-A shows the standard width of sidewalks and bike lanes for the various roadway classifications. Refer to the City of Denton Standard Details for the locations of sidewalks and bike lanes within the street ROW. The Denton Mobility Plan should be reviewed for any planned bicycle and pedestrian facilities that may exceed those called for by the standard details. Any portion of the proposed facility extending past the ROW shall be contained within a pedestrian access easement. The recorded easement shall extend two (2) feet beyond the edge of the facility.

Table 5.7-A: Bike and Sidewalk Requirements

Roadway Classification	Min. Sidewalk Width [1]	Min. Bike Lane Width [1]
Freeway	N/A	
Arterials – Primary and Secondary	5	10
Major Collector	8	10
Collector – Commercial and Residential	8	10
Local – Residential	5	N/A
Local – Rural	N/A	N/A
Local – Alley	N/A	N/A

Notes:
[1] Refer to the City of Denton Standard Details street cross-sections for specific bike and pedestrian recommendations.
[2] Sidewalks must be at least 6 inches away from the ROW line.
[3] Sidewalks must have green space/parkway between sidewalk and street curb per city Standard Details.
[4] If sidewalks are provided at the back of the curb, then the minimum width must be 6 feet.
[5] Inlet covers cannot be part of the sidewalk.
[6] Existing sidewalks that do not comply with ADA and City/Mobility Plan standards should be upgraded to meet current City, Mobility Plan and ADA requirements.
[7] For sidewalks or other pedestrian facilities proposed in a TxDOT ROW, a TxDOT permit will be required to do any work.

A. On Bridges

Sidewalks on bridges shall be a minimum width of six (6) feet or wider, as required by the street classification. All street bridges shall have sidewalks on both sides of the bridge. Dependent upon vehicular and pedestrian traffic considerations, a parapet wall may be required to separate the sidewalk from the travel lane. Parapet walls shall be constructed to TxDOT standards. A pedestrian bridge rail shall be constructed on the outside of the bridge to protect sidewalk traffic. Both bridge rails and parapet walls shall meet accessibility standards.

B. On Drainage Crossings

Sidewalk at drainage crossings shall be a minimum width of six (6) feet or wider as required by the street classification. Sidewalk railing shall be provided to protect the sidewalk traffic from the outside edge of the drainage crossing. Dependent upon vehicular and pedestrian traffic considerations, a parapet wall may be required to separate the sidewalk from the travel lane. Parapet walls shall be constructed to TxDOT standards. Railing and parapet walls shall meet accessibility standards.

C. Adjacent to Screen Walls

A minimum additional sidewalk width of two (2) feet shall be required beyond the standard width of sidewalk, for sidewalks adjacent to screen walls.

D. Adjacent to Retaining Walls

A minimum greenspace width of five (5) feet between the sidewalk and the edge of a retaining wall shall be required, for sidewalks adjacent to retaining walls.

5.7.4 Intersection

A. Curb Ramps

The continuation of accessible routes through intersections shall use approved curb ramps that meet accessibility standards. Refer to the City of Denton Standard Details for curb ramps at intersections. Crosswalks through the intersections shall meet accessibility standards.

The following provisions further define requirements for sidewalk connections, proposed barrier-free ramps (BFRs), and receiving BFRs to ensure continuity, safety, and full accessibility throughout the intersection.

1. Sidewalks connecting to existing BFRs at intersections must be fully ADA-compliant.
2. Proposed BFRs at project corners must be aligned with existing or planned BFRs on the opposite corners. Plans shall illustrate the full intersection layout, including all ramps and crosswalks.
3. A receiving BFR is required in accordance with PROWAG standards for all new construction and alterations to existing facilities. If no receiving ramp exists on the opposite side of the intersection, a new receiving ramp with an appropriate landing must be constructed, regardless of whether a sidewalk is present. Any exceptions from this requirement must be approved by the City's Engineer.

B. Bike Lanes

Bike lanes at intersections shall consider other traffic movements and facilities such as turn lane movements, transit facilities, parking, and stop bar locations. The current Urban Intersection Design Guide by TxDOT can be used for bike lane design at intersections. The bike lane design at intersections requires the approval of the City's Engineer.

5.7.5 Signage and Pavement Markings

Signage and pavement markings shall be as shown on the TMUTCD Marking & Sign Drawings, and in accordance with the accessibility standards.

A. Crosswalks

Continental type-high visibility crosswalk markings are to be provided in all uncontrolled street crossings, school crossings, downtown areas, or as directed by the City's Engineer.

B. Bike Lane

Traffic control devices such as vertical flex posts, green pavement markings, and wayfinding signage may be required to enhance the proposed bicycle facility, as directed by the City's Engineer. For additional guidance, refer to Section 5.5.5.A of this manual.

5.7.6 Amenities

A. Bike Parking

1. Refer to Bicycle Parking Guideline 2nd Edition by the Association of Pedestrian and Bicycle Professionals (APBP) for general guidelines and resources.

2. All bicycle parking facilities/devices shall be constructed to meet commercial grade structural standards.
3. Location Standard:
    a. Bicycle parking must be on the same lot as the principle use.
    b. Bicycle parking must be located in highly visible and well-lit areas.
    c. Bicycle parking must not interfere with accessible paths of travel or accessible parking as required by the accessibility standards.
    d. Bicycle parking must be located within 50 feet of a main building entrance. In multiple building locations, bicycle parking must be distributed in a manner that serves all entrances.
4. Layout and Design:
    a. Bicycle rack design:
        i. Support the bicycle in at least two (2) places.
        ii. Enable the frame and at least one (1) wheel to be secured.
        iii. Designed to accommodate "U" shape locking devices.
        iv. Installed to the manufacturer's specifications.
        v. Each bike rack must be designed to accommodate at least two (2) bikes.
        vi. Each bike rack space should be a minimum of two (2) feet in width and six (6) feet in length.
    b. Bicycle Parking Space
        i. Concrete pad built to City of Denton sidewalk standards.
        ii. Must provide clearance of at least two (2) feet from closest wall.
        iii. Must provide clearance of at least three (3) feet between bike racks.
        iv. Must not interfere with pedestrian pathway.

In addition to selecting an appropriate bicycle rack type, the overall layout of bicycle parking areas shall be designed to ensure safe, efficient, and accessible use. Minimum recommended dimensions for bicycle rack areas are provided in the APBP Bicycle Parking Guidelines, as shown in Figure 5.23. For larger bicycle parking areas with high turnover rates, multiple access points are recommended to facilitate user circulation and reduce congestion. Where feasible, bicycle parking areas should be oriented and designed to provide protection from weather elements, enhancing both usability and longevity of the racks.

B. Benches

All benches shall be constructed to meet commercial-grade structural standards. Benches shall be secured to prevent displacement. Benches shall not project into any accessible route or alter an accessible route such that it will not meet the accessible route standards.

C. Lighting and Enclosures

Lighting standards and above-ground enclosures shall not extend into any accessible route or alter an accessible route such that it will not meet the accessible route standards.

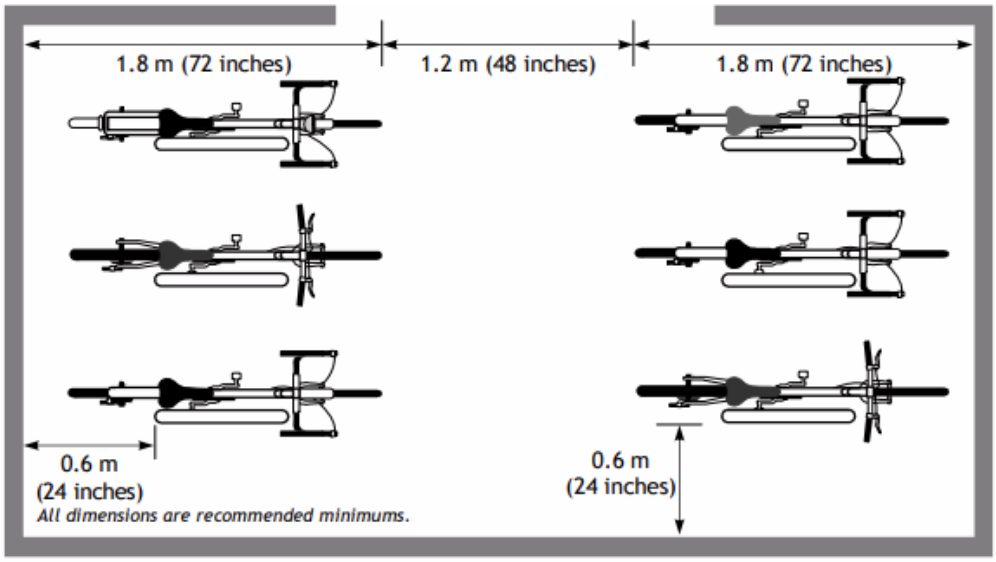


Figure 5.23 APBP-recommended design dimensions for bicycle rack areas

5.8 Transit Facility Design

5.8.1 General

Bus stops shall meet at a minimum the design standards of the Denton County Transit Authority (DCTA), and the accessibility standards of TAS, PROWAG, and ADA. Figure 5.24 show a general layout of a bus stop at an intersection. Bus stops shall be located on the departing side of a street intersection. The use of a pull-out lane may be considered where the specific site conditions warrant such an arrangement. The determination of the appropriateness of a pull-out lane shall rest with the City's Engineer.

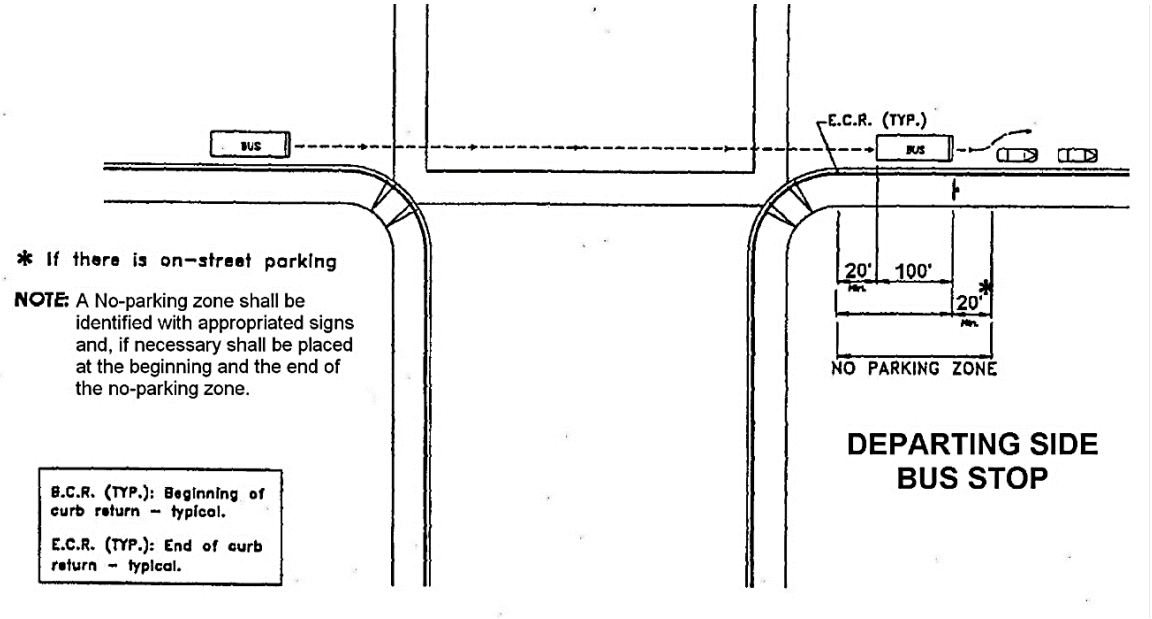


Figure 5.24 Standard Bus Stop Location at Unsignalized Intersection

Note: For signalized intersections an Approach Side Bus Stop is preferred

5.8.2 Bus Stop Placement

Bus stop placement should consider the need for the bus stop, traffic operation concerns, and passenger accessibility. A bus stop should be placed within an area that allows bus stop amenities to be located in the public ROW and where the ingress and egress of the bus does not overly impede the flow of traffic. The warrant for a bus stop shall be as required by the City of Denton in conjunction with DCTA. Elements to consider for bus stop placement include the following:

A. ADA and PROWAG compliance of all elements, including pedestrian routes, shelters, signing, etc.

B. Within Public ROW, or a dedicated access easement.

C. Proximity to major trip generators such as malls, student housing areas, retail commercial zones, park and rides, destination areas, etc.

D. Pedestrian facilities such as sidewalks or multi-use paths, marked cross walks, space provisions for accessibility standards, and curb ramps should be available at the location for a proposed bus stop.

E. Convenient passenger transfers to other routes.

F. Open and visible location for personal security and passenger visibility.

G. Acceptable street illumination or proposed street illumination with placement.

H. Ability to have restrictive parking in bus zone.

I. Adequate space for bus zone.

J. Gentle street grades at bus zone.

K. Return to traffic without overly hindering traffic flow.

L. No interference from driveways.

5.8.3 Bus Stop Amenities

The following are bus stop amenities that shall be considered during the process of design:

A. Accessibility compliant loading area. All bus stops shall have accessibility compliant loading and offloading area. This area shall be integral to the sidewalk pathway, bench area, and shelter area, if provided. The loading area shall be constructed of reinforced concrete with the same thickness as the adjacent sidewalk.

B. Bench and trash receptacle may be warranted based upon Table 5.8-A. Bench and trash receptacle type and installation shall be as required by the City of Denton.

C. A shelter may be warranted based upon Table 5.8-A The shelter type and installation shall be as required by the City of Denton and DCTA. Shelters shall provide space to meet accessibility standards.

D. Illumination shall be provided if illumination is not provided at the street corner adjacent to the bus stop, or if in the opinion of the City's Engineer the existing illumination is inadequate.

E. Bus stops that accumulate 10 points or more may be considered for shelter placement. Bus stops that accumulate six (6) points or greater may warrant a bench and trash receptacle.

Table 5.8-A: Bus Stop Amenities Warrant	
Points	**Condition**
6 points	25 people per day boarding
4 points	Special needs, i.e., Senior Center, Medical Complex, libraries, high accessibility standard usage such as group residences
4 points	High use location, i.e., Student housing area, schools, hospitals, mall
2 points	Request for improvements by citizens, i.e., multiple requests over a one-year time
6 points	15 people per day or greater boarding
4 points	Adjacent to an arterial roadway

5.8.4 Bus Stop Signage and Markings

Bus stop signage and markings shall be according to the City of Denton and DCTA. Signage shall include a "No Parking Zone" sign and a DCTA bus stop sign.

5.9 Traffic Impact Analysis Guidelines

5.9.1 General

The purpose of the traffic impact analysis (TIA) is to assess the impacts of development on the existing roadway system within the study area of the development and to assess the traffic flow needs within the development. The thoroughfare component of the Mobility Plan and the City of Denton traffic model establishes the base conditions for assessing the impacts. The current traffic model and the assessment is based on a Level of Service D according to the current Highway Capacity Manual. The TIA shall be signed and sealed by a licensed Professional Engineer (PE) in the State of Texas, and shall be valid for a period of 3 years, unless there is a significant change in the plans or surrounding conditions, as determined by City's Engineer.

5.9.2 Trip Generation Assessment

A trip generation assessment shall be required for all proposed developments. Developers shall submit the City-adopted Trip Generation Assessment Worksheet ("TGA Worksheet") as part of Traffic Scoping submittal process. Refer to City's TIA Scoping Checklist. The TGA Worksheet must reflect unadjusted trip generation projections for the proposed development, prepared in accordance with the following resources and methodologies:

A. Trip forecasts shall be based on the most recent edition of the ITE Trip Generation Manual. Developers shall utilize conservative trip estimates, specifically values falling between the Average Rate and Fitted Curve Equation, where both are provided.

B. If an appropriate ITE Land Use Code is not available, applicants may submit empirical trip generation data from comparable facilities of similar size and function within the Dallas–Fort Worth metropolitan area. Supporting documentation must include a detailed description of the data collection methodology, a demonstration of land use comparability, a description of site conditions, and verification of data reliability. If alternative data sources are used, applicants must provide justification and supporting documentation. All alternative data sources are subject to review and approval by the City's Engineer.

The City's Engineer shall evaluate the TGA Worksheet, in combination with the thresholds and criteria specified in Section 5.9.3, to determine whether a TIA is required for the proposed development.

5.9.3 When is a TIA required?

Based on the TGA Worksheet for the proposed project, unless otherwise directed by the City 's Engineer, a TIA will be required for the following conditions:

A. Development will generate equal to or more than 50 Peak-Hour Trips (PHT).

B. Development will generate equal to or more than 1,000 vehicle trips per day (VPD).

C. Project area to be developed is equal to or more than 100 acres.

D. Changes or alterations to the City Thoroughfare plan based on the Mobility Plan will be requested.

E. Access is taken from a TxDOT roadway, subject to both City and TxDOT TIA requirements.

F. Zoning changes that will negatively increase estimated traffic volumes above the current zoning estimated traffic volumes.

G. Access is taken from an existing roadway with current traffic flow congestion based upon observed conditions.

H. Development plus recently approved or pending development projects which have not been constructed located adjacent to the site and/or in proximity to the site, meet the above vehicular trip criteria or acreage criteria as determined by the City's Engineer.

5.9.4 TIA Category and Study Area

Table 5.9-A shows the number of analysis periods and study area limits for TIAs.

Table 5.9-A: Criteria for Study Requirements

Analysis Category	Site Trips Generated at Full Build-Out	TIA Analysis Periods [1]	Minimum Study Area [3]
I	50-99 total peak hour trips	1. Existing year 2. Opening year [2]	1. All site access drives
II	100-500 total peak hour trips	1. Existing year 2. Opening year [2] 3. Five years after opening	1. All site access drives 2. All signalized intersections and/or major unsignalized intersections within ½-mile to 1 mile of site boundary, depending on total peak hour trips
III	>500 total peak hour trips	1. Existing year 2. Opening year of each phase 3. Five years after initial opening 4. Twenty years after final opening with full build-out	1. All site access drives 2. All signalized intersections and/or major unsignalized intersections within 1-½ miles of site boundary and/or major intersections along access routes to/from regional corridors

Notes:
[1] Analysis periods shall include build and no-build scenarios. Assume full occupancy when each phase opens.
[2] Assume full build-out.
[3] For certain projects, the City may require an enlarged study area. Land uses within the study area should include recently approved or pending development adjacent to the site and/or in proximity to the site.

5.9.5 TIA Scoping and Report

A. TIA Scoping

If a TIA is warranted for a development under the conditions outlined in Section 5.9.3, the developers shall prepare and submit a TIA Scoping Memorandum in accordance with the City's most recently adopted TIA Scoping Checklist. The scoping process ensures consistency, transparency, and effective coordination between the developers and the City. A TIA will not be accepted for review without an approved TIA Scoping Memorandum.

The TIA Scoping Memorandum shall:

1. Establish the appropriate level of analysis for the proposed development (from Table 5.9-A);
2. Define study area boundaries and identify required intersections and roadway segments (following Table 5.9-A);
3. Identify traffic data collection requirements and study periods (following Table 5.9-A); and
4. Confirm the methodologies, assumptions, and evaluation tools to be applied in the study.

Refer to the City of Denton TIA Scoping Checklist for further details.

B. TIA Report

TIAs shall be prepared in accordance with the City of Denton TIA checklist, the approved TIA traffic scoping, the Denton Development Code (DDC), and TxDOT standards, as applicable. At a minimum, TIA reports shall address the following:

1. Project Description and Existing Conditions – Summarize the proposed development (land use, size, location, phasing) and document existing roadway characteristics, intersection control, traffic volumes, and any planned improvements within the defined study area.
2. Trip Generation, Distribution, and Future Conditions – Estimate trips per Section 5.9.2 methodology, assign them to the network, and evaluate traffic operations with and without the project, considering background growth and approved developments.
3. Operational and Access Analysis – Assess performance of key intersections and roadway segments (LOS, delay, v/c, queues), driveway spacing and sight distance, and internal circulation. School developments shall include a Traffic Management Plan.
4. Multimodal and Safety Considerations – Identify pedestrian, bicycle, and transit impacts along with any safety deficiencies.
5. Mitigation Strategy and Commitments – Identify operational or safety issues resulting from the proposed development and recommend appropriate mitigation, such as turn lanes, signal adjustments, intersection or geometric modifications, access management strategies, or multimodal enhancements. Proposed improvements should be clearly categorized by timing and responsibility, distinguishing between those required at opening day and those that may be phased or coordinated with other developments or agencies. Recommendations must form a practical implementation plan demonstrating how anticipated impacts will be effectively addressed.

It must be noted that the City's Engineer reserves the right to request additional data, analyses, or scenarios based on project scope or site-specific conditions. Refer to the City of Denton TIA Checklist for detailed formatting and submittal requirements.

5.9.6 School Traffic Management Plan

A. Purpose

Schools generate atypical traffic conditions that require special consideration. They produce higher-than-usual vehicular traffic, concentrated traffic loads at specific times, and a mix of different vehicle types. Consequently, traffic management should be given the highest priority when evaluating new school sites, upgrading existing sites, or reviewing ongoing school operations.

A School Traffic Management Plan (TMP) is a site-specific plan that addresses the school campus and adjacent street network. It provides guidelines to coordinate traffic circulation during school peak hours, ensuring that all road users are safely and efficiently guided through the site while maintaining the performance of the roadway and minimizing impacts on surrounding properties.

B. Applicability

A TMP is required for:

1. Any new school development; or
2. Developments that are expected to significantly impact traffic operations at an existing school.

The TMP must be prepared and submitted as part of the TIA to demonstrate that traffic conditions at school access points have been adequately evaluated and mitigated.

C. TMP Preparation and Certification

1. The TMP shall be prepared by a licensed Professional Engineer (PE) in the State of Texas with expertise in transportation and traffic engineering, preferably certified as a Professional Traffic Operations Engineer (PTOE).
2. Field observations of both morning drop-off and afternoon pick-up periods shall form the basis of the TMP.
3. The TMP must be signed, stamped, and dated by the licensed PE and include a statement confirming that it was developed with input from individuals familiar with the site's traffic characteristics, including contact information for the approving school administration official.
4. The TMP should be prepared in a format suitable for distribution to parents, students, and school staff.

D. TMP Content Requirements

The TMP shall include, at a minimum, the following elements:

1. Site and Roadway Description
    a. Location of the school site and description of adjacent roadways.
    b. All points of vehicular and pedestrian access (ingress and egress).
2. TMP Exhibit
    a. Scaled site diagram showing building footprints, curbs, pavement markings, parking areas, and designated student drop-off and pick-up locations.
    b. Aerial images are not acceptable due to replication challenges.

3. Traffic Operations
    a. Summary table indicating school schedule, student enrollment by grade, maximum vehicular accumulation, on-site storage capacity, and surplus during dismissal periods or at designated loading zones.
    b. On-site traffic circulation plan, including any temporary traffic control devices.
    c. Proposed coordination system for student drop-off and pick-up (e.g., passenger identification, separation of transportation modes, and staggered arrival/dismissal times).
4. Staffing and Supervision
    a. Number and location of school staff assisting with loading/unloading students, with roles and responsibilities clearly defined.
    b. Number and location of adult crossing guards or off-duty law enforcement personnel.
5. Pedestrian and Bicycle Considerations
    a. Identification of pedestrian routes up to 0.5 miles from all school access points.
    b. Strategies to encourage walking and biking.
6. Parking and Parent Communication
    a. Parking management strategies for on-site and nearby public areas.
    b. Communication plan to inform and engage parents, students, staff, and neighbors regarding the TMP.
7. Additional Considerations (if applicable)
    a. School bus loading and unloading operations.
    b. Methodology for projected maximum vehicular accumulation.
    c. Traffic control plan showing signage on public rights-of-way.
8. High-Speed Roadway Considerations: For schools adjacent to roadways with posted speed limits of 35 mph or greater, the TMP shall include:
    a. Turning movement counts at all major intersections adjacent to the school.
    b. Stopping and intersection sight distances at all school driveway approaches.

5.9.7 Safety Assessment

Consistent with the recently adopted Mobility Plan, safety is the number one priority for the City of Denton and as such, all new developments will be required to conduct a safety assessment as part of their TIA. The safety assessment will include a review of safety for all road users (vehicles, pedestrians and bicycles) within the project site as well as along existing public ROWs in the vicinity of the project. The assessment will include a review of the following:

A. Within the project site (Site Circulation).

B. All new intersections including project driveways.

C. Evaluation of Historic Crash Data at all existing intersections and roadways included in the TIA.

5.9.8 Queue Analysis for Drive Through Facilities

A review of proposed drive through operations must be included in the TIA. The evaluation must include:

A. Illustration of proposed operations (i.e. access points and queue formation).

B. Anticipated maximum demand/queue (preferably based on observations of other existing sites with similar characteristics or using service rate queue analysis).

C. Maximum queuing capacity on-site.

D. Mitigation plan (Exhibit showing site plan) for if/when traffic ever exceeds design capacity to prevent queues blocking sidewalks or travel lanes of adjacent roads. The plan needs to show how the operator would have to manage longer queues without compromising safety (e.g. double queue, cones, pavement markings, signs, etc.). The plan needs to be signed by the traffic engineer whom the City would contact if/when needed to resolve back up problems once the tenant is in operations - same as the traffic study.

E. The following information must also be included:

1. Peak hour turning movements at intersections with driveway during AM & PM peak hours of adjacent street.
2. Average Daily Traffic on abutting street.
3. Show adjacent street traffic lane configuration, dedicated turning lanes, traffic control.
4. Site plan showing all dimensions of all driveways, sidewalks, crosswalks.

5.9.9 TIA Submission and Review Procedures

A. Trip Generation Assessment

The Trip Generation Assessment, as described in Section 5.9.2 of this Manual, must be completed and submitted as Part A of Traffic Scoping submission to see if a TIA is required.

B. TIA Scoping

1. If a TIA is required (as determined in the TGA worksheet), or clearly warranted under conditions in Section 5.9.3, TIA Scoping must be submitted following the direction provided in section 5.9.4, 5.9.5.A & the City's TIA Scoping Checklist Past B section.
2. The TIA scope must be reviewed and approved by the City prior to TIA application submittal.

C. TIA Report Submission

TIA Report Submission must follow Section 5.9.5.B and the City's TIA checklist.

D. TIA Updates

If the development's proposed land use or traffic generation characteristics change after TIA approval, the TIA must be updated and resubmitted to the City for approval.

5.10 Pavement Design Standard

5.10.1 Streets

The minimum pavement section requirements for each classification of roadway are contained within the City of Denton Standard Details for pavement cross-sections.

A. A geotechnical report shall be prepared that documents the existing soil characteristics of the proposed roadway subgrade for any proposed street improvements. Soil testing shall be performed whenever the soil characteristics change or every 500 feet, whichever is less. The report shall include recommendations for the type and treatment level of subgrade stabilization based upon ultimate traffic conditions.

B. Flex-base may be used as an option for subgrade treatment. Depth of flex-base required shall be based upon the geotechnical report for the street improvements based upon ultimate traffic conditions.

C. Alternative pavement sections may be proposed only if supported by a geotechnical report that provides sufficient evidence to demonstrate that the alternate section shall meet the ultimate traffic loading requirements.

5.10.2 Drive Approach

Refer to the City of Denton Standard Details for drive approach section requirements.

5.11 Complete and Context-Sensitive Streets

Complete streets are transportation facilities that are planned, designed, operated and maintained to provide safe mobility for all users (including bicyclists, pedestrians, transit vehicles, truckers and motorists) appropriate to the function and context of the facility. Context-sensitive solutions formulate a complete street design considering contextual applications. Contextual applications can be of geographical nature such as Urban Core, General Urban, Suburban, University Core and other typical service areas that require unique components to address the overall transportation facilities.

Within the geometric standards are options that relate to developing a complete street that accounts for all transportation facilities within the context of the associate area. Connectivity and context-sensitive solutions are essential to meeting the goals of the standards. Refer to the City of Denton Standard Details for cross-section details, and the pedestrian and bicycle components of the 2022 Mobility Plan for planned facilities, or as required by the City of Denton during development review.

BIKE LANES – Bike lanes shall be six (6) feet wide unless otherwise approved by the City's Engineer. Buffered or separated bike lanes are generally preferred to increase level of comfort in the bicycle facility.

OFF-STREET MULTI-USE PATH – Some development areas will warrant the use of off-street multi-use paths for pedestrian and bicycle traffic connectivity to other facilities as identified by the City of Denton. Multi-use paths shall be 10 feet wide, unless otherwise approved by the City's Engineer.

TRANSIT – Bus stop locations may be required by the City of Denton for connectivity of the transit system. *See* Section 5.8 of this Manual for details.

MEDIAN VS. CONTINOUS LEFT TURN LANE – Selection of a median or continuous left turn lane shall be based upon the TIA, connectivity, adjacent uses, and other factors required by the City's Engineer. Medians shall be 24 feet back of curb to back of curb, unless otherwise approved by the City's Engineer. Continuous left turn lanes shall be 11 feet wide.

MODIFICATIONS TO STANDARDS – Modifications to the standards may have to be considered in some instances based upon context-sensitive use. An example of context-sensitive use which may require the standards to be modified is a roadway corridor restriction that creates limitations that cannot be altered. An example of a roadway corridor restrictions would be existing infrastructure and/or buildings that must

remain. Another example is infill development. Modifications to the standards based upon context-sensitive use shall be at the sole discretion of the City's Engineer.

Section 6: Water and Wastewater Design Criteria

6.1 Overview

The purpose of Section 6 - Water and Wastewater Design Criteria is to provide minimum, non-exhaustive criteria for the design and construction of water distribution and wastewater collection systems within the City of Denton, Texas and its extraterritorial jurisdictions.

It is the responsibility of the design engineer to ensure the final design of water distribution and wastewater collection systems are in conformance with the most recently adopted versions of the following documents:

A. Texas Administrative Code (TAC) Title 30, Part 1, TCEQ – Ch. 290;
B. Texas Administrative Code (TAC) Title 30, Part 1, TCEQ – Ch. 217;
C. Texas Administrative Code (TAC) Title 16, Part 2, PUCT – Ch. 24;
D. City of Denton Code of Ordinances and the DDC;
E. The City of Denton's Standard Details and Standard Specifications for Construction;
F. City of Denton Water Distribution System Master Plan;
G. City of Denton Wastewater Master Plan;
H. American Water Works Association (AWWA) Standards;
I. The International Building Code (IBC);
J. The International Plumbing Code (IPC);
K. The International Fire Code (IFC); and
L. This Manual.

The criteria established in Section 6 of this Manual provide basic guidance for the design of water and wastewater systems. However, ***full responsibility and liability for proper design remains with the design engineer.*** Users of this Manual should be knowledgeable and experienced in the theory and application of water and wastewater engineering. If criteria established in Section 6 overlap with state statutes, rules, or regulations, –the more stringent requirement shall apply. The criteria established in this Section do not supersede the criteria contained in the DDC. In the case of conflict between this Section, City of Denton Standard Details, or other cited City regulations and standards, the more stringent requirement shall apply.

The General Manager of Water Utilities and Street Operations reserves the right to require extended review, direct the design, location specifications and details of vertical water utility infrastructure, and large horizontal infrastructure including, but not limited to, water treatment plants (WTPs), elevated storage tanks (ESTs), booster pump stations, water mains 16 inches in diameter or greater, wastewater reclamation plants, peak flow detention facilities, sewer lift stations and sewer interceptors over 12 inches in diameter. The General Manager of Water Utilities and Street Operations reserves the right to deny proposals at his or her discretion.

6.1.1 Organization

Section 6 - Water and Wastewater Design Criteria is organized as follows:

A. Overview
B. Water Design Criteria
C. Wastewater Design Criteria
D. Construction Plans

6.2 Water Design Criteria

6.2.1 Distribution System Extensions

A. General

Water mains shall be sized to meet the calculated water demand, fire flow protection requirements, and to conform to the City of Denton's Water Distribution System Master Plan (Water Master Plan or WMP). All residential, commercial, industrial, and any other development connecting to the City's water distribution system shall use the following guidelines:

1. The design engineer shall obtain the record drawing water maps from the Capital Improvement Projects & Engineering Division and use the following criteria, based on the City's WMP, for sizing the water lines.
    a. Average daily demand in gallons per capita per day = 160 GPCD
    b. Maximum daily demand / Average daily demand = 2.0
    c. Peak hour demand / Maximum daily demand = 1.5
    d. For Single-Family Residential – Use 3.2 people/unit
    e. For Multifamily Residential – Use 2.5 people/unit
    f. Refer to 30 TAC § 290.45 (d)(1) Table A - Non-community water systems
2. Water distribution systems extensions shall provide sufficient connections to the City's existing water system, integrating existing main extensions to the development (including dead-end mains) from adjacent properties to the system extension, for the demand of the proposed extension and shall be extended to neighboring properties for subsequent system extensions. System extensions shall be of sufficient size to furnish adequate domestic, irrigation and fire protection water supply to all lots within the development and conform to the City WMP. Every new water system extension shall include two (2) or more connections to the existing City water system when feasible, to ensure an adequate and reliable water supply in the event of a water main break or routine system maintenance. The City may require two (2) or more meter connections, particularly for large and/or densely developed lots. Good engineering judgement is required to ensure reliability is considered in the design of all proposed water systems
3. Every development shall provide adequate water capacity for fire protection purposes. Fire flow capacity requirements are in addition to daily demand requirements. The procedure for determining fire flow requirements for buildings or portions of buildings shall be in accordance with the version of the IFC adopted by the City. For any platted lot where the end use is not defined, the standards in Table 6.2-A shall apply
4. The cost for modeling a project's impact with the City's distribution system model will be the responsibility of the developer and paid to the City.

B. Distribution System Operational Limits

The City observes the following operational limits for the distribution system under normal usage:

1. Maximum velocity for mains (16 inches or more): 3 fps, with up to 5 fps on case-by-case basis
2. Maximum velocity for mains (16 inches or less) under non-fire flow conditions: 5 fps
3. Maximum velocity for mains (12 inches or less) under maximum day demand + fire flow scenario: 10 fps
4. Maximum head loss (12 inches or less): 5 feet per 1,000 feet
5. Maximum head loss (16 inches or more): 3 feet per 1,000 feet
6. Hazen-Williams Roughness Coefficient (C): 130

Proposed impacts to the City's system determined to, or likely to, cause (through hydraulic modeling or other analysis) these limits to be exceeded, are prohibited without additional improvements to the public system to allow proper operation of the system.

Table 6.2-A: Water Capacity for Fire Flow

Area	GPM
One (1) and two (2) family dwellings - less than 3,600 sq. ft.	1,000
Buildings other than one (1) and two (2) family dwellings - less than 3,600 sq. ft.	1,500
Medium-intensity commercial and light industrial	3,000
High-intensity commercial and industrial	4,000

Notes:
[1] All fire flows to be calculated with 20 psi residual pressures.
[2] In addition to the fire flow requirements specified above, all developments shall provide adequate water capacity to satisfy the greater of: (a) Peak Hour demand for the Peak Day, or (b) Average Hour demand plus fire flow for the Peak Day.
[3] Special exceptions to the above standards may be made by the City's Engineer for unique situations.

C. Public Fire Hydrants

Fire flow requirements shall be in accordance with the IFC as adopted by the City of Denton or Denton County, as appropriate.

D. Private Fire Mains

In addition to the requirements of Section 6.2.1.B of this Manual above, private fire protection water mains shall be installed in accordance with NFPA 24 and the adopted IFC requirements. Private fire protection mains and associated hydrants shall be permitted by the Fire Marshal's Office with jurisdiction.

E. Fire Flow Tests

Fire flow tests are normally requested by the design engineer, the Mechanical, Electrical and Plumbing (MEP) engineer, and other engineers to determine available water system capacity at or near the point of interest. If a fire flow test on the existing water system is necessary, contact Water Distribution at FireFlowTesting@cityofdenton.com.

F. Pressure Planes

The City of Denton's Water Distribution System is divided into several water pressure planes to ensure even water-pressure gradients. Prior to the design of connection points between a

proposed main and any existing main, the design engineer shall investigate and determine if the proposed water main crosses the boundary between different pressure planes.

Even though physical connections of water pipes exist between pressure planes, they are designed with valves which are closed at the boundary points so that each pressure planes is isolated. Proposed mains that approach pressure planes boundaries shall be designed to loop within their designated pressure planes and with no or minimum lengths of dead-end mains.

Connections between pressure planes must be approved by the General Manager of Water Utilities and Street Operations and may require pressure-reducing valve stations. The design engineer can determine the pressure planes boundaries by consulting the record drawings which show the designated closed valves between pressure planes and by contacting Water Utilities. *See* Figure 6.1 below for the 2025 Water System Pressure Plane Map.

The Central pressure plane operates at a Hydraulic Grade Line (HGL) of 826 feet and includes service elevations between 540 feet and 700 feet. It is recommended that any areas above 700 feet be served from the West pressure plane, if possible. An alternative to connecting new development to the higher-pressure plane includes grading sites at or below 700 feet. Areas at elevations below 600 feet may experience high pressure. Individual Pressure Reduction Valves (PRVs) may be needed to maintain an acceptable pressure range.

Eastern pressure planes (i.e. East and Southeast) have a HGL of 745 feet are supplied from the Central pressure plan by reducing pressure via system pressure-reduction valves. Service elevations for the eastern pressure planes range from 515 feet and 615 feet.

The West pressure plane operates at an HGL of 900 feet at the Northwest EST, 905 feet at the Southwest EST and includes service elevations between 670 feet and 770 feet. The boundary between the West and Central pressure plane generally follows the 670-foot contour. Any areas at elevations greater than 770 feet will not be able to be served by the existing distribution system due to low static pressures. Areas near the suction side of the Southwest Boost Pump Station should be served from the West pressure plane due to the decreased residual pressure in the Central pressure plane in this area.

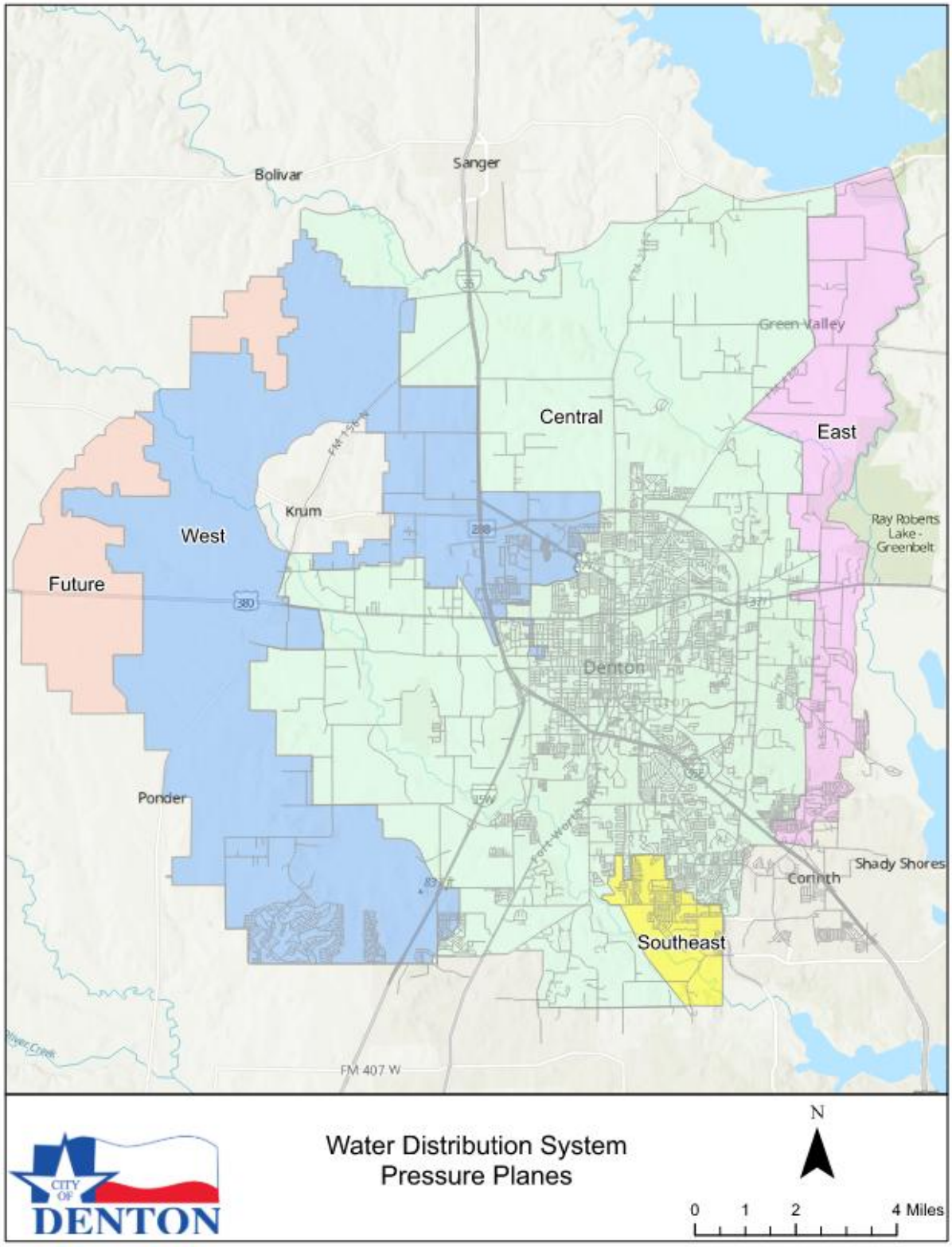


Figure 6.1 2025 Water Master Plan Pressure Plane Map

6.2.2 Water Main Horizontal and Vertical Alignment

The following guidelines should be followed by the design engineer in placement of water lines:

A. In existing streets, water lines shall be placed in the pavement four (4) feet from back of curb. For new residential development, water lines shall be placed on the north and east sides of the streets, where possible, four (4) feet from back of curb. See the City of Denton Standard Details.

B. All water lines shall be laid as straight as possible. Avoid excessive number of high points and low points between cross street connections, as they trap air pockets. See Section 6.2.6.B of this Manual for placement of air release valves.

C. Minimum radius of curvature and maximum deflection angle of pipe joints are restricted to the manufacturer's recommendation, after which, horizontal or vertical bends are required. Deflection of pipe shall only be permitted through joint deflection; no bending of pipe is allowed.

D. Vertical bends shall be no greater than 45 degrees.

E. Except for transverse pipe crossings, no other utility shall be installed over, under or within five (5) feet horizontally of a water line.

F. There shall be at least two (2) feet of vertical separation between a water line and any utility or storm drain crossing it.

G. Water lines shall not be located closer than 10 feet to any building or structure, or located where the excavation of which could place the stability of another structure in jeopardy.

H. Where distribution mains run parallel to transmission mains 16 inches or larger, a non-standard cross-section detail will need to be coordinated with the Water Utility and accommodate the ROW width, gravity and pressurized wastewater mains, reuse water mains and storm drainage mains.

I. The WMP is a guide for transmission main alignment and subject to formal and informal updates.

6.2.3 Depth of Cover for Water Mains

The following table shall govern depth of cover for water main installations:

Table 6.2-B: Minimum Depth of Cover for Water Mains

Pipe Size	From Surface to Top of Pipe	
	UNDER UNPAVED AREAS	UNDER PROPOSED OR EXISTING PAVEMENT
12-in. and smaller	5 feet	42 inches
16-in.	-	5 feet
16-in. and larger	6 feet	-
20-in. and larger	-	6 feet

Notes:
[1] Additional depth of cover shall be required for low-lying areas where future drainage improvements are anticipated.

6.2.4 Pipe and Fittings

A. Specifying the appropriate pipe material is the responsibility of the design engineer, based on the analysis of specific site and loading conditions, and pressure requirements. The minimum requirements in this Section are based on pipe size only, and in no way relieve the design engineer

of the responsibility of specifying the pipe material applicable to the specific project. Pipe gasket material shall be that recommended by the manufacturer for the specified pipe. Special attention shall be given by the design engineer for unique pipe fitting and pipe assembly situations.

B. Water pipe shall be a minimum of eight (8) inches in diameter. The standard pipe sizes that shall be used for water main lines are 8-in., 12-in., 16-in., 20-in., 24-in., 30-in., 36-in., and 42-in. pipes. Pipe sizes of 6-in., 10-in., 14-in., 18-in., 21-in., and 33-in. are considered non-standard by the City and may not be used for water main lines. A 6-in. pipe may be used for fire hydrant connections.

C. Water mains 16 inches and greater in diameter shall have preplanned points of connection of no less than 12 inches in diameter for distribution extensions. Tees with branch valves shall be used for preplanned connections.

D. See Table 6.2-C below for the City's minimum pipe materials, fittings, polywrap, thrust restraint, and embedment requirements, as a function of pipe size.

E. All fittings for pipe sizes less than 30 inches in diameter, including vertical and horizontal bends, shall have concrete thrust blocking. *See* City of Denton Standard Details.

F. All vertical and horizontal fittings and valves shall require restrained joints in addition to concrete thrust blocking. The joint restraints shall be designed as though there is no concrete thrust blocking, and the concrete thrust blocking shall be designed as though there are no joint restraints. Flanged tees should be used to secure all branch valves to fittings. Table 6.2-C below includes the minimum lengths of pipe to be restrained for 8-inch and 12-inch PVC water mains. For water lines greater than 12 inches in diameter, additional restrained joints may need to be installed beyond the fitting (i.e., may need to be installed on several pipe joints on each side of the fitting), depending on the required restrained length calculated. Restrained length calculations shall be included in the lay schedule in the material submittal package and shall use approved methods of joint restraint. *See* City of Denton Standard Details, specific product listings and Table 6.2-C below.

G. Geotechnical reports detailing soil conditions, that may affect the design, operation or maintenance of water infrastructure are required. Corresponding corrosion protection systems are to be provided for metallic pipe materials including reports detailing the operation and maintenance of the corrosion protection systems. Corrosion system design reports must be included with record drawings.

Table 6.2-C: Restraint Lengths for Fittings and Bends

Pipe Size (inches)	Plugs, Tees, and Valves [1]	Bends [1]			
		90°	45°	22.5°	11.25°
8	88 ft	33 ft	14 ft	7 ft	4 ft
12	126 ft	45 ft	19 ft	9 ft	5 ft

Notes:

[1] Length to be restrained on each side of the bend or fitting. Assumptions: 1.5 safety factor, SP soil type, Type 4 trench.

Table 6.2-D: Minimum Requirements for Pipe and Fittings

Pipe Size and Material	Ductile Iron Fittings	Corrosion Protection	Thrust Restraint	Embedment
8-IN. TO 12-IN.				
PVC (AWWA C900, DR – 14)	Mechanical joint; Compact or Full-Body	8-mil V-Bio Enhanced Polywrap (fitting only)	Wedge-action mechanical joint restraint glands, at fittings.	See drawings U201, U202, U203A, U203C in City of Denton Standard Details
16-IN. TO 20-IN.				
Ductile Iron, AWWA C151, Special Thickness Class 52, push-on-joints (where unrestrained; e.g.: American Flex-Ring joint)	Mechanical joint; Full-Body	8-mil V-Bio Enhanced Polywrap (inner layer), plus 4-mil cross-linked (outer layer) Bonded joint and Cathodic Protection (CP) System required	Wedge-action mechanical joint restraint glands, at fittings. Boltless Restrained connections (Example: American Flex-Ring joint), at several pipe joints either side of each fitting, depending on the required restrained length calculated.	See drawings U201, U202, U203A, U203C in City of Denton Standard Details
Reinforced Concrete Steel Cylinder, AWWA C303 Bar Wrapped	N/A	Bonded joint and Cathodic Protection (CP) System required	Full Circle Welded Joints required for thrust restraint	Contact Water Utilities Dept.
24-IN.				
Ductile Iron, AWWA C151, Special Thickness Class 52, push-on joints (where unrestrained; e.g.: American Flex-Ring joint)	Mechanical joint; Full-Body	8-mil V-Bio Enhanced Polywrap (inner layer), plus 4-mil cross-linked (outer layer) Bonded joint and Cathodic Protection (CP) System required	Wedge-action mechanical joint restraint glands, at fittings. Boltless Restrained connections (Example: American Flex-Ring joint), at several pipe joints either side of each fitting, depending on the required restrained length calculated.	Crushed Stone
Reinforced Concrete Steel Cylinder, AWWA C303 Bar Wrapped	N/A	Bonded joint and Cathodic Protection (CP) System required	Full Circle Welded Joints required for thrust restraint.	Contact Water Utilities Dept.
30-IN. AND LARGER				
Ductile Iron, Pressure Class 350; push-on joints (where unrestrained; e.g.: American Flex-Ring joint)	Mechanical joint; Full-Body	8-mil V-Bio Enhanced Polywrap (inner layer), plus 4-mil cross-linked (outer layer) Bonded joint and Cathodic Protection (CP) System required	Wedge-action mechanical joint restraint glands, at fittings. Boltless Restrained connections (Example: American Flex-Ring joint), at several pipe joints either side of each fitting, depending on the required restrained length calculated.	Crushed Stone
Reinforced Concrete Steel Cylinder, AWWA C303 Bar Wrapped	N/A	Bonded joint and Cathodic Protection (CP) System required	Full Circle Welded Joints required for thrust restraint.	Contact Water Utilities Dept.

6.2.5 Connections

A. Methods of Connection

1. Tapping Sleeve and Valve

   Tapping sleeves with tapping valves shall be used whenever possible for connections to existing mains to avoid interruption of water services. *See* Figure 3.1 in Drawing PIAZ13 of the City of Denton Standard Details.

   a. As per AWWA C223, size-on-size taps are allowed up to 12 inches (e.g.: 12-in. x 12-in.)

   b. Taps on pipes 16 inches and larger must be approved in writing in advance by the City's Engineer after demonstrating the demand is greater than the availability from the distribution existing system. Taps to mains 16 inches and greater must be a minimum of 12 inches and utilize an isolation valve of the same size as the tap. Extensions may be reduced by fittings after the tapping valve. *See* Figure 3.2 in Drawing PIAZ13 of the City of Denton Standard Details.

   c. Connections to fire hydrant leads on existing mains 16 inches and larger may be allowed on a case-by-case basis after consultation and written approval by the City's Engineer.

   d. All water service lines, two (2) inches and smaller, require taps as per City of Denton Standard Details.

2. Cut-in Connection

   Cut-in connections are only allowed to existing mains larger than 12 inches, where a size-on-size connection is needed. *See* Figure 3.4 in Drawing PIAZ14 of the City of Denton Standard Details.

3. Main Extensions

   A new valve shall be installed at the point of connection for water main extensions. This will facilitate the testing and chlorination of the new main prior to its placement into service. *See* Figure 3.5 in Drawing PIAZ14 the City of Denton Standard Details.

   Note that the developer is responsible for all surface rehabilitation associated with connecting to the City's Water Utilities. Surface rehabilitation must match existing site conditions or better.

B. Flushing and Disinfection

Refer to all current City specifications and TCEQ requirements for Flushing and Disinfection.

6.2.6 Valves

A. Isolation Valves

1. Location

   Isolation valves shall be provided to allow for the proper operation and maintenance of the water distribution system, and to ensure water quality can be maintained for each individual water customer connected to the system.

   The location of valves needs to properly address the ability of the Department of Water Utilities to remove a water line from service to perform necessary repairs, while critically minimizing the interruption of service for fire protection and to customers. Isolation of any given section of water line should generally be able to be accomplished by closure of the

least number of valves, as would generally be expected under good engineering design practices and utility engineering standards. The Department of Water Utilities reserves the right to require changes to proposed designs to satisfy these objectives.

The design engineer shall place valves on proposed water mains so they may be easily located in the future by operations and maintenance crews.

The following guidelines should be used by the design engineer in placement of isolation valves on proposed water mains:

a. Two (2) valves are to be installed at every main branch tee location, one (1) flanged to the branch of the tee and the other a mechanical joint connection on one (1) of the two (2) runs of the tee. *See* Figure 3.6 in Drawing PIAZ15 of the City of Denton Standard Details. Three (3) valves are to be installed at every cross location, each a mechanical joint connection.

b. Valves for line sizes 12 inches in diameter or less should not be spaced any farther apart than 1,000 feet. For city blocks that are longer than 1,000 feet between street intersections, placement of a valve will be required between street intersections.

c. Valves should be generally located so that no more than four (4) valves are required to isolate a section of main. *See* Figure 3.7 in Drawing PIAZ15 of the City of Denton Standard Details. For mains larger than 12 inches in diameter, valve spacing and placement shall be subject to alternate criteria approved by the City's Engineer.

d. All fire hydrant leads must be designed with a valve that is flanged to the main line. *See* Drawings W401A and W401B of the City of Denton Standard Details.

2. Specifications

Refer to Table 6.2-L and Standard Specifications 33 14 20 Resilient Seated (Wedge) Gate Valves and 33 14 21 AWWA Rubber-Seated Butterfly Valves.

Table 6.2-E: Isolation Valve Requirements

Size	4-in. to 12-in.	16-in. to 20-in.	24-in.	30-in.	36-in. or larger
Type	Gate Valve (AWWA C509 resilient-seat)	Gate Valve (AWWA C515 resilient-seat)	Gate Valve (AWWA C515 resilient-seat)	Gate Valve (AWWA C515 resilient-seat)	Gate Valve (AWWA C515 resilient-seat) or butterfly, to be determined by City on a case-by-case basis
Orientation	Vertical	Vertical	Vertical	Vertical or horizontal; to be determined by City on a case-by-case basis	Vertical or horizontal; to be determined by City on a case-by-case basis
Gear Operator Required	No	No	Yes	Yes	Yes
Vault Required	No	No	Yes	Yes	Yes
Bypass Required	No	No	No	Yes	Yes

3. Details

   Refer to Drawings W104, W105, W106A, W106B, and W601 of the City of Denton Standard Details.

B. Air Release Valves and Air/Vacuum-Air Release Valves

For water mains less than 16 inches in diameter in certain situations where the topography, remoteness, or some other hydraulic factor necessitates it, air release valves are required at local high points to facilitate automatic release of accumulated air.

For water mains 16 inches and larger, the City requires air/vacuum-air release valves at local high points to facilitate automatic release of accumulated air and to facilitate automatic prevention of vacuum conditions within the line. *See* Drawings W801 and W802 of the City Standard Details.

Manholes shall not be placed in sidewalks, pedestrian ramps, driveway approaches, or in the bottom or on the slopes of a drainage channel or drainage structure. Manholes shall be kept a minimum of 40 feet from any railroad track.

C. Pressure Reduction Valves and Pressure Sustaining Valves

Public pressure reduction valves and pressure sustaining valves are to be coordinated with and written approval obtained from the City's Engineer in consultation with the Field Operations division. Valves shall be located where they are accessible to City staff and located in a vault sized for the valve assemblies and staff access in unpaved areas of ROW and/or PUE. PUEs shall be sized considering the size of the vaults, depth of the water main, and site constraints, including, but not limited to, highways, creeks, railroads, existing and proposed structures, ingress and egress availability, topography, and ESAs.

D. Blowoff Valve Assemblies

Water mains 16 inches and larger shall be equipped with blowoff valve assemblies sized to facilitate 3 fps scouring velocities within the main, flushing and draining of the water main for maintenance. Assemblies are to be located at low points where sediment can accumulate and to ensure complete drainage of the main to allow for repairs to be completed on empty mains.

The discharge piping of the blowoff assembly must direct flushed water towards drainage infrastructure without causing flooding. Erosion prevention must be included in the design of the assembly and direction of discharged water. The location of the assemblies must be in a public ROW or utility easement in an unpaved area large enough for operation of the assembly.

6.2.7 Dead-End Mains

A. Dead-end main situations should be avoided whenever possible, except for main extensions to neighboring property for future extension.

B. In lieu of dead-end mains, the design should loop through public ROW or a dedicated public utility easement (with adequate assurance of access and fencing prohibited) to another nearby water main using the same size pipe.

C. If a dead-end main situation is unavoidable, it shall be designed so that it may be periodically flushed of stagnant water by locating a fire hydrant or other flushing device near the main's end and past the last service connection. *See* City of Denton Standard Detail W603.

6.2.8 Fire Hydrant Locations and Coverage

A. The design engineer should locate fire hydrants as close as possible to street intersections, but outside of the curb radius. This positioning of fire hydrants provides coverage along several streets. When spacing requirements necessitate the installation of fire hydrants between street intersections, they should be placed at the projection of lot lines between property owners. For main replacement projects in established neighborhoods, fire hydrants should be designed as close as possible to the old fire hydrant location, provided coverage is adequate. Neighborhood residents are familiar with the fire hydrant being at that location and normally expect a replacement fire hydrant to be placed at the same location. Fire hydrants are not to be installed closer than nine (9) feet to any wastewater main, manhole, or appurtenance.

B. Fire hydrant spacing shall comply with the 2021 IFC Appendix C Fire Hydrant Locations and Distribution, and be easily accessible by City staff and First Responders. *See* City of Denton Standard Details W401A and 401B, and Standard Specifications 33 14 40 Fire Hydrants. Fire hydrants shall be placed at a maximum of 500 feet apart in single-family residential areas and a maximum of 300 feet apart in all other areas, unless a closer spacing is required by the IFC.

6.2.9 Meters and Meters Cans/Vaults

The City allows the following water meters, depending on the volume and nature of the customer flow demands:

Table 6.2-F: Allowable Water Meters

Service Size	Meter Size	Type	AWWA Standard
1-in.	⅝-in. x ¾-in.	Positive Displacement	AWWA C700
1-in.	¾-in. x ¾-in.	Positive Displacement	AWWA C700
1-in.	1-in.	Positive Displacement	AWWA C700
2-in.	1½-in.	Positive Displacement	AWWA C700
2-in.	2-in.	Positive Displacement	AWWA C700
4-in.	3-in. Tru/Flo	Compound	See City Standard Specification 33 14 18
4-in.	4-in. Tru/Flo	Compound	See City Standard Specification 33 14 18
6-in.	6-in. Tru/Flo	Compound	See City Standard Specification 33 14 18
6-in.	6-in. Protectus III Fire Service (Shall be used for combination of domestic and fire service)	Compound	See City Standard Specification 33 14 18
8-in.	8-in. Protectus III Fire Service (Shall be used for combination of domestic and fire service)	Compound	See City Standard Specification 33 14 18

Notes:
[1] Turbine meters shall be allowed for irrigation meters; not for domestic meters.
[2] Venturi meters shall be allowed when recommended by City Water Utilities based on Single-Family Equivalent calculations.
[3] Fire hydrant meters shall only be used for non-potable purposes.
[4] Vaults are required for all meters greater than two (2) inches.
[5] *See* Section 6.2.9.D for Furnishing and Installing meters.
[6] Non-standard sized water services are not allowed. Refer to the water service connection drawings on the City of Denton Standard Details.
[7] Sites that require an irrigation meter shall have two (2) separate service line connections onto the main; one (1) for the domestic meter, and the other for the irrigation meter.

A. Number of Meters

One (1) meter is required for each residential, commercial, or industrial service connection, in accordance with the Code of the City of Denton, Texas, Chapter 26, Article I, Sec. 26-9. An apartment building, condominium, manufactured housing community, or mobile home park may be considered a single commercial facility for the purpose of this section. The City's standard policy is that only one (1) meter for domestic use will be furnished to each lot. Exceptions to that policy are:

1. Multifamily, commercial, industrial, or institutional sites shall have a separate irrigation meter from the domestic meter with a separate service line to the distribution main;
2. Multifamily developments with greater than 200 units shall be required to have two (2) domestic meters for redundancy and reliability of water service, where each meter is located on a different water main or separated by an inline valve. Note that Fire Code may require redundant (secondary) fire suppression connections;
3. Multi-building sites where the configuration or size of the site makes a single meter location impractical or infeasible;
4. Institutional Group I-2 Facilities as per IBC Sec. 308.3 and IPC Sec. 609; and
5. Submetering by the property owner to tenants of multifamily developments with a minimum of five (5) units per building (or by condominium associations to member) shall be done at the owner's expense, with privately purchased and maintained meters, and in accordance with the Public Utilities Commission 16 TAC Chapter 24 Subchapter I, as amended.

B. Sizing

In commercial and industrial projects, the design engineer shall consult with the owner or the MEP engineer to identify proposed sizes and locations for domestic water meters, fire sprinkler connections, and irrigation meters.

During Building Permit review, the City evaluates adequacy of meter size using Table E201.1, "Minimum Size of Water Meters, Mains and Distribution Piping Based on Water Supply Fixture Unit Values (w.s.f.u.)" of the version of the International Plumbing Code (IPC) as adopted by the City (copy included herein as Table 6.2-G). The City's Building Permit Plans Review uses the version of the International Residential Code as adopted by the City, Table P2903.6, "Water-Supply Fixture-Unit Values for Various Plumbing Fixture and Fixture Groups" (see Table 6.2-H) to estimate w.s.f.u. To facilitate review of the proposed meter size, the design engineer shall submit a tabulation of w.s.f.u.; a sample tabulation is provided herein in Table 6.2-J.

Contact the Water Utilities Department regarding criteria for sizing fire-rated master meters.

For commercial or industrial sites that utilize large amounts of water in their production process, the developer shall provide estimated peak daily demand. Meter to be sized to 1.25 times (1.25x) the peak daily demand.

The total service units for multifamily apartment projects with eight (8) or more units shall be determined by multiplying the total number of bedrooms in the multifamily apartment project by 0.26 Single-Family Equivalents (SFEs).

Table 6.2-G: Minimum Size of Water Meters, Mains, and Distribution Piping based on water-supply fixture-unit (w.s.f.u) values

Meter and Service Pipe (inches)	Distribution Pipe (inches)	Maximum Development Length (feet)									
PRESSURE RANGE 30 TO 39 PSI		**40**	**60**	**80**	**100**	**150**	**200**	**250**	**300**	**400**	**500**
3/4	1/2[1]	2.5	2	1.5	1.5	1	1	0.5	0.5	0	0
3/4	3/4	9.5	7.5	6	5.5	4	3.5	3	2.5	2	1.5
3/4	1	32	25	20	16.5	11	9	7.8	6.5	5.5	4.5
1	1	32	32	27	21	13.5	10	8	7	5.5	5
3/4	1-1/4	32	32	32	32	30	24	20	17	13	10.5
1	1-1/4	80	80	70	61	45	34	27	22	16	12
1-1/2	1-1/4	80	80	80	75	54	40	31	25	17.5	13
1	1-1/2	87	87	87	87	84	73	64	56	45	36
1-1/2	1-1/2	151	151	151	151	117	92	79	69	54	43
2	1-1/2	151	151	151	151	128	99	83	72	56	45
1	2	87	87	87	87	87	87	87	87	87	86
1-1/2	2	275	275	275	275	258	223	196	174	144	122
2	2	365	365	365	365	318	266	229	201	160	134
2	2-1/2	533	533	533	533	533	495	448	409	353	311
PRESSURE RANGE 40 TO 49 PSI		**40**	**60**	**80**	**100**	**150**	**200**	**250**	**300**	**400**	**500**
3/4	1/2[1]	3	2.5	2	1.5	1.5	1	1	0.5	0.5	0.5
3/4	3/4	9.5	9.5	8.5	7	5.5	4.5	3.5	3	2.5	2
3/4	1	32	32	32	26	18	13.5	10.5	9	7.5	6
1	1	32	32	32	32	21	15	11.5	9.5	7.5	6.5
3/4	1-1/4	32	32	32	32	32	32	32	27	21	16.5
1	1-1/4	80	80	80	80	65	52	42	35	26	20
1-1/2	1-1/4	80	80	80	80	75	59	48	39	28	21
1	1-1/2	87	87	87	87	87	87	87	78	65	55
1-1/2	1-1/2	151	151	151	151	151	130	109	93	75	63
2	1-1/2	151	151	151	151	151	139	115	98	77	64
1	2	87	87	87	87	87	87	87	87	87	87
1-1/2	2	275	275	275	275	275	275	264	238	198	169
2	2	365	365	365	365	365	349	304	270	220	185
2	2-1/2	533	533	533	533	533	533	533	528	456	403
PRESSURE RANGE 50 TO 60 PSI		**40**	**60**	**80**	**100**	**150**	**200**	**250**	**300**	**400**	**500**
3/4	1/2[1]	3	3	2.5	2	1.5	1	1	1	0.5	0.5
3/4	3/4	9.5	9.5	9.5	8.5	6.5	5	4.5	4	3	2.5
3/4	1	32	32	32	32	25	18.5	14.5	12	9.5	8
1	1	32	32	32	32	30	22	16.5	13	10	8
3/4	1-1/4	32	32	32	32	32	32	32	32	29	24
1	1-1/4	80	80	80	80	80	68	57	48	35	28
1-1/2	1-1/4	80	80	80	80	80	75	63	53	39	29
1	1-1/2	87	87	87	87	87	87	87	87	82	70
1-1/2	1-1/2	151	151	151	151	151	151	139	120	94	79
2	1-1/2	151	151	151	151	151	151	146	126	97	81
1	2	87	87	87	87	87	87	87	87	87	87

Table 6.2-G: Minimum Size of Water Meters, Mains, and Distribution Piping based on water-supply fixture-unit (w.s.f.u) values

Meter and Service Pipe (inches)	Distribution Pipe (inches)	Maximum Development Length (feet)									
1-1/2	2	275	275	275	275	275	275	275	275	247	213
2	2	365	365	365	365	365	365	365	329	272	232
2	2-1/2	533	533	533	533	533	533	533	533	533	486
PRESSURE RANGE OVER 60 PSI		**40**	**60**	**80**	**100**	**150**	**200**	**250**	**300**	**400**	**500**
3/4	1/2[1]	3	3	3	2.5	2	1.5	1.5	1	1	0.5
3/4	3/4	9.5	9.5	9.5	9.5	7.5	6	5	4.5	3.5	3
3/4	1	32	32	32	32	32	24	19.5	15.5	11.5	9.5
1	1	32	32	32	32	32	28	28	17	12	9.5
3/4	1-1/4	32	32	32	32	32	32	32	32	32	30
1	1-1/4	80	80	80	80	80	80	69	60	46	36
1-1/2	1-1/4	80	80	80	80	80	80	76	65	50	38
1	1-1/2	87	87	87	87	87	87	87	87	87	84
1-1/2	1-1/2	151	151	151	151	151	151	151	144	114	94
2	1-1/2	151	151	151	151	151	151	151	151	118	97
1	2	87	87	87	87	87	87	87	87	87	87
1-1/2	2	275	275	275	275	275	275	275	275	275	252
2	2	365	368	368	368	368	368	368	368	318	273
2	2-1/2	533	533	533	533	533	533	533	533	533	533

Notes:

[1] Minimum size of building supply is ¾-in. pipe.

[2] User shall follow the most recently adopted code; above table was the most recent version at the time of publication of this Manual.

Source: 2021 International Plumbing Code – Table E201.1

Table 6.2-H: Water-supply fixture-unit (w.s.f.u) values for Various Plumbing fixtures and Fixture Groups

Type of Fixtures or Group of Fixtures	Load in w.s.f.u. values		
	HOT	COLD	COMBINED
Bathtub (with/without overhead shower head)	1.0	1.0	1.4
Clothes washer	1.0	1.0	1.4
Dishwasher	1.4	—	1.4
Full-bath group with bathtub (with/without shower head) or shower stall	1.5	2.7	3.6
Half-bath group (water closet and lavatory)	0.5	2.5	2.6
Hose bibb (sillcock)[1]	—	2.5	2.5
Kitchen group (dishwasher and sink with/without garbage grinder)	1.9	1.0	2.5
Kitchen sink	1.0	1.0	1.4
Laundry group (clothes washer standpipe and laundry tub)	1.8	1.8	2.5
Laundry tub	1.0	1.0	1.4
Lavatory	0.5	0.5	0.7
Shower stall	1.0	1.0	1.4
Water closet (tank type)	—	2.2	2.2

Notes:

[1] The fixture unit value 2.5 assumes a flow demand of 2.5 GPM, such as for an individual lawn sprinkler device. If a hose bibb/sill cock will be required to furnish a greater flow, the equivalent fixture-unit value may be obtained from this table or Table P2903.6(1).

[2] Supply loads in the building water-distribution system shall be determined by total load on the pipe being sized, in terms of w.s.f.u., as shown in Table P2903.6, and gallons per minute (GPM) flow rates [see Table P2903.6(1)]. For fixtures not listed, choose a w.s.f.u. value of a fixture with similar flow characteristics.

[3] For SI units: 1 GPM = 3.785 Liters per minute (L/m).

[4] User shall follow the most recently adopted code. The above table was the most recent version at the time of publication of this Manual.

Source: 2021 International Residential Code – Table P2903.6

Table 6.2-I: Load Values assigned to Fixtures [1]

Fixture	Occupancy	Type of Supply Control	Load in w.s.f.u values		
			COLD	HOT	COMBINED
Bathroom group	Private	Flush tank	2.7	1.5	3.6
Bathroom group	Private	Flushometer-valve	6.0	3.0	8.0
Bathtub	Private	Faucet	1.0	1.0	1.4
Bathtub	Public	Faucet	3.0	3.0	4.0
Bidet	Private	Faucet	1.5	1.5	2.0
Combination fixture	Private	Faucet	2.25	2.25	3.0
Dishwashing machine	Private	Automatic	—	1.4	1.4
Drinking fountain	Offices, etc.	⅜-in. valve	0.25	—	0.25
Kitchen sink	Private	Faucet	1.0	1.0	1.4
Kitchen sink	Hotel, restaurant	Faucet	3.0	3.0	4.0
Laundry trays (1 to 3)	Private	Faucet	1.0	1.0	1.4
Lavatory	Private	Faucet	0.5	0.5	0.7
Lavatory	Public	Faucet	1.5	1.5	2.0
Service sink	Offices, etc.	Faucet	2.25	2.25	3.0
Shower head	Public	Mixing valve	3.0	3.0	4.0
Shower head	Private	Mixing valve	1.0	1.0	1.4
Urinal	Public	1-in. flushometer-valve	10.0	—	10.0
Urinal	Public	¾-in. flushometer-valve	5.0	—	5.0
Urinal	Public	Flush tank	3.0	—	3.0
Washing machine (8-lb.)	Private	Automatic	1.0	1.0	1.4
Washing machine (8-lb.)	Public	Automatic	2.25	2.25	3.0
Washing machine (15-lb.)	Public	Automatic	3.0	3.0	4.0
Water closet	Private	Flushometer valve	6.0	—	6.0
Water closet	Private	Flush tank	2.2	—	2.2
Water closet	Public	Flushometer valve	10.0	—	10.0
Water closet	Public	Flush tank	5.0	—	5.0
Water closet	Public or private	Flushometer tank	2.0	—	2.0

Notes:

[1] For fixtures not listed, loads should be assumed by comparing the fixture to one listed using water in similar quantities and at similar rates. The assigned loads for fixtures with both hot and cold water supplies are given for separate hot and cold water loads and for total load. The separate hot and cold water loads are three-fourths of the total load for the fixture in each case.

[3] For SI units: 1 inch = 25.4 mm, 1 pound = 0.454 kg.

[4] User shall follow the most recently adopted code. The above table was the most recent version at the time of publication of this Manual.

Source: 2021 International Plumbing Code – Table E103.3(2)

Table 6.2-J: Sample w.s.f.u Tabulation

Fixture	Quantity	Load Values, in Total w.s.f.u (each)	Total Fixture Units
Water Closet (Public; Flush Valve)	9	10.0	90
Water Closet (Public; Flush Tank)	3	5.0	15
Urinal (Public; ¾-in. Flush Valve)	5	5.0	25
Lavatory (Public)	10	2.0	20
Kitchen Sink (Hotel, Restaurant)	2	4.0	8
Service Sink	1	3.0	3
Shower Head (Private)	1	1.4	1.4
		Total	**162.4**

Table 6.2-K: Land Use and Service Units/SFE Equivalencies

Meter Type	Meter Size	Typical Land Use	Single-Family Equivalents (SFEs)
Positive Displacement	⅝-in. x ¾-in.	Residential – Single-Family (Building less than 1,300 sq. ft. per lot size less than 6,000 sq. ft.)	0.5
Positive Displacement	⅝-in. x ¾-in.	Residential – Single-Family	1.0
Positive Displacement	¾-in. x ¾-in.	Residential / Commercial	1.5
Positive Displacement	1-in.	Residential / Commercial	2.5
Positive Displacement	1½-in.	Commercial	5.0
Positive Displacement	2-in.	Commercial	8.0
Compound	3-in.	Commercial / Industrial	22.5
Compound	4-in.	Commercial / Industrial	50.0

Notes:
Source: City of Denton Approved Meter Manufacturer's Specifications;
City of Denton Code of Ordinances Section 26-218 - Water and Wastewater Facilities - Exhibit F

C. Location

Water meters and meter cans and vaults shall be placed within a City ROW, Public Utility Easement or Public Water Easement. Placement shall also satisfy the following requirements:

1. Located as close as possible to the public water main;
2. Easily accessible to City of Denton employees; and
3. Located in an unpaved area that does not conflict with vehicular or pedestrian traffic.

D. Furnishing and Installing

All meters two (2) inches and smaller, shall be furnished and installed by City Water Utilities for fees per the current Fee Schedule. All meter assemblies three (3) inches and larger and their associated vaults, shall be furnished and installed by Contractor at their expense and inspected by Public Works Inspection and City Water Utilities.

E. Details

Details of the meter can assemblies for meter sizes two (2) inches and smaller are shown in the City

of Denton Standard Details.

Details of the meter vault assemblies for meter sizes three (3) inches and larger are shown in the City of Denton Standard Details.

F. Backflow Prevention

Note that this section of the DCM, 6.2.9.F-Backflow Prevention will be superseded and void upon the adoption of a formal City Ordinance governing backflow prevention assembly requirements in the near future.

Backflow Prevention Assemblies are required in accordance with the International Plumbing Code, 2021 IFC, 30 TAC § 290.44. Backflow Prevention Assemblies must be utilized as follows:

1. At each dedicated fire line connection. A flanged fire line valve shall be required to connect to the tee located on the main line and a fire line valve shall be required outside the downstream side of the vault or ROW line whichever applies;
2. After each meter of any site served by redundant domestic meters;
3. At facilities supporting Recreational Vehicle (RV) connections for the purpose of flushing waste tanks;
4. At all services outside City limits, in accordance with 30 TAC § 290.47(f)); and
5. At all properties that have an auxiliary water source. These properties must protect connections to the public water system using a reduced pressure backflow assembly (RPBA).

Backflow prevention devices shall be placed at the ROW or an easement line adjacent to the connection to the public water system.

6.2.10 Underground Utility Crossing

Water mains shall be separated from wastewater mains as set forth in 30 TAC § 290.44(e) - Location of Waterlines, as amended.

Where water mains are laid under or over another buried utility line or underground facility (i.e., storm drain, culvert boxes, franchise utilities, etc.), special requirements may be necessary for the protection of the water main. Table 6.2-L provides requirements for different crossing situations. This table is not a replacement for separation requirements for sewer and water lines as governed by 30 TAC §§ 217.53 and 290.44, respectively.

Table 6.2-L: Utility Crossing Requirements

Water Utility	Crossing	Utility Line Size (in.)	Separation (feet)	Special Requirement
New/existing Water	Under	< 24	≥ 2	None
New/existing Sewer	Under	< 24	≥ 2	None
New/existing Water	Under	24 to 42	≥ 2	None
New/existing Sewer	Under	24 to 42	≥ 2	None
New Water	Under	> 42	≥ 2	Encased in 150±psi pressure class pipe
Existing Water	Under	> 42	≥ 2	Encased in split steel casing
New Sewer	Under	> 42	≥ 2	Encased in 150±psi pressure class pipe
Existing Sewer	Under	> 42	≥ 2	Encased in split steel casing
New Water	Under	≥ 10	≥ 2	Cased in steel pipe
Existing Water	Under	≥ 10	≥ 2	Cased in split steel pipe
New Sewer	Under	≥ 10	≥ 2	Cased in steel pipe
Existing Sewer	Under	≥ 10	≥ 2	Cased in split steel pipe
New/existing Water	Over	< 24	≥ 2	None
New/existing Sewer	Over	< 24	≥ 2	None
New/existing Water	Over	≥ 24	≥ 2	None
New/existing Sewer	Over	≥ 24	≥ 2	None

A. To minimize crossing impacts, crossings must be perpendicular, if possible.

B. Utility crossings with less than two (2) feet of separation require a design deviation request (which will include special requirements) after providing a thorough analysis detailing physical and economic factors involved.

C. Pursuant to the Code of the City of Denton, Texas, Chapter 25, Article II, Sec. 25-80-Facility Size and Locations, all ROW user facilities are required to maintain a minimum separation of 24 inches from all City utility system facilities. If a ROW user may encounter a hardship due to this requirement, the ROW user may request a design deviation as detailed in Section 9 of this Manual.

D. Split-steel casing shall follow sizing requirements of pressure-rated casing.

E. See City Standard Specification Section 33 05 07 Steel Casing Pipe.

F. Casing spacers shall be placed not more than five (5) feet apart.

G. Encasement shall be extended a minimum of three (3) feet beyond the edge of the utility or facility to be crossed. Water mains that cross utility lines in private easements must adhere to the requirements of the easement owner, as well as those listed above.

6.2.11 Fence or Wall Crossings

A. Water mains should be routed to avoid entering private property. In circumstances where it is impractical to avoid doing so, provisions are required to allow City staff to inspect, maintain, and repair its infrastructure. Water mains crossing fences will require a design deviation request as per Section 9 of this Manual, to be reviewed by the City's Engineer, after thorough consideration of the physical and economic factors involved. Design deviations may require additional provisions beyond this Manual.

B. Water mains crossing under privacy fencing (wood, chain-link, or plastic) shall not require any

special protection.

C. Water mains crossing under other types of fencing will require the fence to be constructed of easily removable panels or have gates that can be removed from the easement.

D. Water mains may not cross under retaining walls.

E. There must be at least two (2) feet of vertical separation between a water line and any utility or storm drain crossing it.

6.2.12 Highway Crossings

Crossings of State or County-controlled roads shall require the review and approval of the appropriate regulatory agency after consultation with the City's Engineer regarding crossing location. Crossings shall meet the requirements provided by the controlling agency and by the City of Denton Standards. In the event of different requirement levels for the same item, the more stringent standard shall apply. Crossing locations must be easily and directly accessible on each side of the highway. Additional access easements and installation of all-weather road surface may be required. The City of Denton shall have final say in the location, criteria and standards of highway crossings considering access, maintenance and repairs.

6.2.13 Railroad Crossings

The design engineer shall, prior to the design of any railroad crossing, contact the appropriate railroad company and regulatory agency to determine if there are any special requirements. Crossings shall be discussed with and must be approved in writing by the City's Engineer. In the event the City of Denton Design Criteria are more stringent than those of the Railroad Company or regulatory agency, the City's standards shall apply. Crossing locations must be easily and directly accessible on each side of the railroad. Additional access easements and installation of all-weather road surface may be required. The City of Denton shall have final say in the location, criteria and standards of railroad crossings considering access, maintenance and repairs.

6.2.14 Creek Crossings

Where a water main is laid under any flowing stream or semi-permanent body of water, such as a marsh or pond, or an identified ESA (*See* DDC 7.4) the water main shall be installed in a separate watertight encasement pipe, with valves on each side of the crossing to allow for the isolation and testing of that portion of the water main to determine if there are any leaks, and to facilitate future repairs after consultation with the City's Engineer.

A primary consideration in the design of creek crossings is the prevention of soil erosion in the areas of trench backfill. The design engineer shall determine the need and limits of any special embedment, and determine and specify the limits for specialized backfills. Crossing locations must be easily and directly accessible on each side of the creek. Additional access easements and installation of all-weather road surface may be required. The City of Denton shall have final say in the location, criteria and standards of creek crossings considering access, maintenance and repairs.

6.2.15 Elevated Crossings

Elevated crossings are not permitted for water mains except for special cases approved by the City's Engineer. Design requirements for approved elevated crossings shall be tailored to the specific project characteristics.

6.2.16 Tunneling, Boring, Jacking and Casing

Tunneling, boring, jacking and casing are methods used for water line placement under restrictive conditions when open-cut construction is not allowed. Only straight pipe alignments for both horizontal and vertical alignment are allowed.

Design engineers should consider the location, size, and depth of boring, tunnelling and receiving pits when choosing the beginning and ending stations for boring or tunnelling. A typical bore pit is between 35 and 40 feet in length to accommodate the boring machine and one (1) joint of pipe. Width of the bore pit can vary depending on the depth and size of pipe, with the narrowest width being approximately 15 feet. Tunnelling pits can vary greatly in size depending on the depth and size of the tunnel to be excavated. Additional size and spacing requirements may be required as outlined in DDC 7.4 when working adjacent to confirmed ESAs. The preferred location for the bore or tunnel pit is the lower elevation end of the bore or tunnel; allowing any groundwater and/or boring slurry to drain from the tunnel into the bore or tunnel pit. The water can then be removed by pumping.

A. Steel casing pipe, where required for open-cut or other than open-cut installation, shall conform to City Standard Specification 33 05 07 Steel Casing Pipe, and be subject to the following guidelines:
    1. Within Railroad ROW – the casing pipe size shall be sufficient to accommodate the outside diameter (OD) of the carrier pipe bell of at least one City standard size greater than what is required (see 6.2.4.B). Additionally, the casing pipe size must accommodate any external joint restraint fittings required to restrain the carrier pipe. The annular space between the carrier pipe and casing pipe shall not be grouted.
    2. All other situations – the casing pipe size shall be sufficient to accommodate the OD of the carrier pipe bell plus an additional four (4) inches of clear space. The carrier pipe shall be restrained through grout applied to the annular space between the casing and carrier pipe so external pipe restraints are not required.

B. Carrier pipes through casing shall be restrained as follows:
    1. Segmented PVC and DIP shall be restrained with either external restraint fittings applied to push-on bell and spigot pipe or by utilizing manufactured restrained joint pipe.
    2. HDPE shall be restrained through fused joints.
    3. Concrete steel cylinder pipe shall be restrained through welded joints.

All carrier pipes shall be supported with approved spacers and casing end seals. Refer to City of Denton Standard Detail U208A and the current City approved Materials Submittal List.

Large diameter (48 inches or greater) or long length bores or tunnels (200 feet or greater) may require tunnel liner plate instead of steel casing. These situations shall require design calculations to identify the type and gage of tunnel liner plate to be utilized per Specification 33 05 08 Tunnel Liner Plate.

6.2.17 Existing Water Main Replacement

A. Whenever an existing main is to be replaced by a new main, use the following guidelines for alignment and design:
    1. The new line should be located as near as possible to the existing line; while allowing the existing line to remain in service, until the new line is ready to be put into service.
    2. If the existing line is in or next to a roadway, the new line should be placed under existing pavement, not behind the curb in the parkway area.

3. The new line should be designed to utilize the existing metering locations where possible.

B. The size of the new line should match the size of the existing line. If the existing line is a non-standard size (i.e., 6-in. or 10-in.) then the new line should be sized for the next larger standard size. The design engineer shall perform field investigations to determine pavement condition over the existing main. The pavement may have been patched due to breaks in the existing main over the years. Based on field investigations, the design engineer shall include additional quantities for pavement replacement, if necessary.

6.2.18 Requirements for Abandoning Water Mains

The design engineer should note the limits and appropriate conditions for the abandoning of existing water mains which are to be replaced by the construction of any proposed water mains.

The design engineer should also make allowances in the design to provide for the existing and proposed mains to be in service simultaneously, until all customer services are transferred from the old main to the new main with minimum interruption of service. If the construction of a proposed main necessitates the abandoning of the existing main prior to the new main's placement into service, then provisions for a temporary water main with services must be addressed by the design.

6.2.19 Water Treatment Plants, Ground Storage Tanks, ESTs, Pressure Tanks, and Booster Pump Stations

If new public water treatment plants (WTPs), ground storage tanks (GSTs), ESTs, pressure tanks and/or Booster Pump Stations are needed to support a development, the design shall be directed by the Water Utility considering the needs of the development and the Water Utility System.

6.3 Wastewater Design Criteria

6.3.1 Estimated Wastewater Flows

For sewers in new developments, sewer lines and lift stations shall be designed to accommodate the projected buildout flows from all residential, commercial, industrial, or institutional sources upstream of the proposed sewer improvement. Figure: 30 TAC § 217.32(a)(3) Table B.1. - Design Organic Loadings and Flows for a New Wastewater Treatment Facility (*see* excerpted information in Table 6.3-A) shall be used as a guide to generate wastewater flows. However, minimum flow capacity for sizing of sewers for peak flow condition shall not be less than the results of the following calculation procedures:

A. Delineate the wastewater drainage area that will drain into the sewer main or lift station. Include all upstream offsite areas.

B. For the development site, use the following design parameters:

1. Table 6.3-A to generate the wastewater loading by type of use.
2. 3.2 capita per lot for single-family.
3. 2.5 capita per unit for multifamily.
4. Apply a 4.0 multiplier to the average daily flow to determine the peak flow.

C. For undeveloped upstream areas, use the following design parameters:

1. 4 lots per acre.

2. 3.2 capita per lot.
3. Average daily flow of 90 GPCD.
4. Apply a 4.0 multiplier to the average daily flow to determine the peak flow.

D. For developed residential upstream areas, use the following design parameters:
1. Count number of single-family lots.
2. Obtain number of multifamily units (available through DCAD)
3. 3.2 capita per lot for single-family.
4. 2.5 capita per unit for multifamily.
5. Average daily flow of 90 GPCD
6. Apply a 4.0 multiplier to the average daily flow to determine the peak flow

E. For developed non-residential upstream areas, use the following design parameters:
1. Average daily flow of 1,500 GPD per acre.
2. Apply a 4.0 multiplier to the average daily flow to determine the peak flow.

For replacement of existing sewers and construction of parallel sewers for additional capacity, wastewater flow data may be provided by the City from data generated by City sewershed computer models. The cost for modeling a project's impact with the City's collection system model will be the responsibility of the developer and paid to the City.

Proposed impacts to the City's system determined to, or likely to, cause (through hydraulic modeling or other analysis) these limits to be exceeded, are prohibited without additional improvements to the public system to address the capacity deficiency.

Table 6.3-A: Design Flows for a New Wastewater Treatment Facility

Source	Remarks	Daily Wastewater Flow (Gal. per person)[1]
Municipality	Residential	75 - 100
Subdivision	Residential	75 - 100
Trailer Park [2] (Transient)	2½ Persons per Trailer	50 - 60
Mobile Home Park [2]	3 Persons per Trailer	50 - 75
School	Cafeteria & Showers Cafeteria/ No Showers	20 15
Recreational Parks	Overnight User Day User	30 5
Office Building or Factory	Facility must be designed for the largest shift	20
Hotel/Motel	Per Bed	50 - 75
Restaurant	Per Meal	7 - 10
Restaurant with bar or cocktail lounge	Per Meal	9 - 12
Hospital	Per Bed	200
Nursing Home	Per Bed	75 - 100
Alternative Collection Systems, e.g., septic tanks	Per Capita	75

Notes:
[1] City of Denton requires usage of the highest number of the TCEQ ranges.
[2] At the time of updating this Manual, the TCEQ is evaluating criteria for tiny homes, and should be consulted as appropriate.
Source: TCEQ Rules - 30 TAC §217.32(a)(3), Table B.1

6.3.2 Size and Slope of Sewers

After the design engineer has determined the wastewater flows per Section 6.3.1 of this Manual, the sewer size can be determined using the following criteria. However, no sewer, other than service laterals and force mains, shall be less than eight (8) inches in diameter.

The size and grade of the proposed sewer shall be evaluated using Manning's formula

$$V = 1.49/n\ (R)^{0.67}\ (S)^{0.50} \qquad \textbf{[Eqn. 6.1]}$$

Where:

V = velocity (in fps)

n = Manning's coefficient of roughness; minimum 0.013

R = hydraulic radius (feet)

S = slope of energy grade line (feet per foot)

Proposed sewers shall be designed with slopes sufficient for velocity of three (3.0) fps, with a minimum required velocity of two (2.0) fps. The minimum acceptable Manning's "*n*" factor for design shall be 0.013, which takes into consideration the slime, grit and grease layers that will affect hydraulics or hinder flow as the pipe matures. The sewer pipe grades shown in Table 6.3-B are based on an "*n*" value of 0.013 and are the minimum acceptable slope for sewer lines.

Table 6.3-B: Minimum and Maximum Pipe Slopes

Size of Pipe - ID (inches)	Minimum Slope (%)	Maximum Slope (%)	Capacity Flowing Full at Min. Slope (MGD)
8	0.335	8.40	0.45
10	0.25	6.23	0.71
12	0.20	4.88	1.03
15	0.15	3.62	1.62
18	0.115	2.83	2.25
21	0.095	2.30	3.07
24	0.08	1.93	4.14
7	0.07	1.65	4.91
30	0.06	1.43	6.23
33	0.055	1.26	7.66
36	0.045	1.12	9.17

The capacity of the sewer pipe flowing full shall be computed by the following equation:

$$C = 0.299/n\ (D)^{2.67}\ (S)^{0.50} \qquad \textbf{[Eqn. 6.2]}$$

Where:

C = capacity (million gallons per day-MGD)

n = Manning's coefficient of roughness; minimum 0.013

D = inside diameter (feet)

S = slope of the energy grade line (feet per foot)

Sewer mains shall be designed to convey peak flow at no more than 80% of full pipe capacity at system buildout.

A. High Velocity Protection

Where velocities greater than 10 fps will occur when a pipe flows full, based on Manning's Equation and an "n" value of 0.013, restrained joint pipe or external restraint systems must be utilized.

6.3.3 Sewer Alignment

Design engineers shall be guided by the following in the alignment of wastewater lines:

A. Collection system extensions must follow topographical depressions and extend to the upstream drainage shed, considering storm drainage improvements. Crossing into other drainage sheds require written approval from City's Engineer;

B. For new construction in areas not served, sewer mains shall be laid straight between manholes. No horizontal or vertical bends are allowed between manholes;

C. Avoid shifting mains from one side of the ROW to the other side of the ROW between street intersections;

D. Where the bypass of existing flows is feasible, it is recommended that replacement mains be constructed horizontally in the same trench;

E. Except for pipe crossings, no franchise utility shall be installed within five (5) feet of a sewer main; and

F. Vertically parallel wastewater mains require written approval from the City's Engineer. Details regarding main access must be planned out including but not limited to the dedicated of easements or City ROW to ensure ability to access the mains, calculations and details showing distances from the main that other utilities may not be placed to preserve ability to access.

6.3.4 Sewer Main Depth and Recommended Cover

A. Minimum depth for the design of sewer mains shall be determined by providing a 2% grade for the lateral from the center of the house or building to the center of the proposed main and including an additional two (2) feet drop. Therefore, for a house 100 feet from the proposed sewer main, the designed depth of the main shall be at least four (4) feet below the FFE of the house since:

2 feet + (2% of 100 feet) = 4 feet **[Eqn. 6.3]**

The lateral also must have at least two (2) feet of cover at its shallowest point. The design engineer is responsible for ensuring sufficient depth and grade is maintained to serve all building sites in the sewer shed.

B. Recommended cover for all sewer mains is four (4) feet to six (6) feet. Minimum cover shall be three (3) feet and six (6) inches or 3-½ feet. Any main approved to have less than minimum cover shall be encased in Class "B" embedment per City Standard Specifications. *See* Drawing U204 of the City of Denton Standard Details.

When establishing depth for proposed wastewater mains, design engineers shall consider the impact of proposed water and drainage improvements especially on service laterals that cross those improvements to connect to the wastewater main.

C. The maximum depth of sewer mains is 30 feet.

6.3.5 Gravity and Force Main Sewer Pipe Material

Gravity and Force Main sewer pipe shall meet the following criteria unless special circumstances require an alternative and is approved by the City's Engineer. Slope of grade across cover shall be a maximum of 4H:1V.

Table 6.3-C: Minimum and Maximum Pipe Slopes

Pipe Diameter	Application	Pipe Material
8-in. to 12-in.	Gravity	PVC – ASTM D3034, SDR 26; HDPE – ASTM D3350, DR-17
15-in.	Gravity	PVC – ASTM D3034, SDR 26
18-in. to 24-in.	Gravity	PVC – ASTM F 679, PS115; Fiberglass Reinforced Plastic – ASTM D3262
6-in. to 60-in.	Force Main	HDPE – ASTM D3350, DR-13.5; DIP – AWWA C150/C151, CL52 or PC 350,

A. For gravity sewer pipe sizes over 24 inches in diameter, design calculations and pipe selection shall be submitted by the development design engineer for review. Approvals will be provided on a project specific basis.

B. Force main sewer pipe shall be designed to meet the working and surge pressure requirements of the specific application. Design calculations and pipe selection shall be submitted by the development design engineer for review.

C. Different pipe materials shall not be mixed between manholes. If it is anticipated that a mixing of materials will occur, the design engineer shall design a manhole at the point of transition of pipe materials. For previously placed stub-out of a material other than PVC pipe, design engineer shall add a note to the plans calling for removal of the stub-out or change the material of the proposed pipe for that section of pipe between manholes.

6.3.6 Sewer Pipe Embedment

The types of embedment and backfill for sewer mains are shown in Drawings U201, U202, U203A, and U203C of the City of Denton Standard Details. Embedment requirements shall be based on sewer mains under proposed pavement, unpaved areas and existing pavement.

6.3.7 Manholes

Manholes constructed on existing or proposed sewer lines shall be sized as follows:

Table 6.3-D: Manhole Sizing

Pipe Diameter	Manhole Diameter
8-in. to 12-in.	4.0 feet (For depths greater than 12 feet, use 5.0 feet)
15-in. to 27-in.	5.0 feet
30-in. to 36-in.	6.0 feet

Notes:

[1] Special manholes shall be designed for mains larger than 36-in. diameter pipe.

The types of manholes allowed by the City are shown in Drawings S101, S102, S103, and S107B of the City of Denton Standard Details. Additionally, connections to manholes must comply with City Standard Specifications.

Generally, manholes shall be stationed on the main run, and where known, the stations of the side mains should also be indicated. When connecting a proposed main to an existing main at a manhole, the connection shall have the top inside elevation of the outfall main level with the top inside elevation of the proposed main. Connections to brick manholes are prohibited.

At the discretion of Water Utilities, Field Operations, or Planning and Engineering Department staff, manholes with known deficiencies will be required to be replaced.

Manholes deeper than 20 feet must be of monolithic construction, such as Glass-fiber Reinforced Polyester.

A. Manhole Locations

Manholes shall be provided at the following locations to facilitate maintenance, cleaning, and inspection:

1. At the location of lateral connections that are 8-in. diameter or larger;
2. At 500 feet intervals on sewer mains 15-in. diameter or smaller; at 800 feet internals on mains 18-in. diameter through 30-in. diameter; at 1,000 feet intervals on mains 36-in. diameter through 48-in. diameter; and at 2,000 feet intervals for 54-in. diameter and larger;
3. At all locations where pipe diameter or pipe material changes;
4. At all locations where the horizontal or vertical alignment of the sewer main changes;
5. At the ends of all mains with service connections. Two main upstream ends may not be combined in one manhole;
6. At the end of any pipe segment at least 150 feet long;
7. At the end of every end-of-line (EOL);
8. Sewer service laterals are to be connected to the sewer main line and not into a manhole unless it is a size-on-size connection;
9. Manholes shall not be placed in sidewalks, pedestrian ramps, driveway approaches, or in the bottom or on the slopes of a drainage channel or drainage structure;
10. At a minimum of 40 feet from any railroad track; and
11. Separation of utilities around manholes shall be a minimum distance of five (5) feet , to allow for maintenance and repair.

6.3.8 Sewer Laterals

A. Water Utilities, Field Operations, or Engineering and Planning staff reserve the right to permit utility-supervised connections to the collection system by non-City staff. Note that the developer will be responsible for all surface rehabilitation associated with connecting to the City's Water Utilities. Surface rehabilitation must match existing site conditions or better.

B. Laterals may not serve more than one (1) lot.

C. Minimum lateral sizes from the sewer main to the public cleanout are:

1. 4-in. minimum for single-family;

2. 6-in. minimum for residential duplex, triplex, and quadplex; and
3. 6-in. minimum for local retail, light commercial, apartment, manufacturing and industrial

D. Single-way clean-outs shall be provided on laterals at the public easement or ROW line. Double-way cleanouts are not allowed. *See* Drawings S403 and S404 of the City of Denton Standard Details.

E. Manholes shall be provided for lateral connections when the lateral pipe diameter is equal to the main sewer pipe diameter or if the lateral is eight (8) inches in diameter or larger.

F. Laterals shall be constructed to the property line and shall be located at a point five (5) feet downstream from the center of the lot on unimproved property. For improved property, design engineers should use technical judgement in lateral placement.

G. Preferred grade for lateral construction within the ROW/PUE is 2%. Laterals within ROW/PUE shall not be designed with less than 1% grade.

6.3.9 Underground Utility Crossings

Wastewater mains and manholes shall be separated from water mains as set forth in 30 TAC §217.53(d) - Separation Distances and 30 TAC §290.44 - Water Distribution.

The requirements of Section 6.2.10 of this Manual shall govern the crossing of underground utility lines by wastewater mains.

6.3.10 Fence or Wall Crossings

The requirements of Section 6.2.11 of this Manual shall govern the crossing of fences or walls by wastewater mains.

6.3.11 Highway Crossings

Crossings of State or County-controlled roads shall require the review and approval of the appropriate regulatory agency after consultation with the City's Engineer regarding crossing location. Crossings shall meet the requirements provided by the controlling agency and by the City of Denton Standards. In the event of different requirement levels for the same item, the more stringent standard shall apply. Crossing locations must be easily and directly accessible on each side of the highway. Additional access easements and installation of all-weather road surface may be required. The City of Denton shall have final say in the location, criteria and standards of highway crossings considering access, maintenance and repairs.

6.3.12 Railroad Crossings

The design engineer shall, prior to the design of any railroad crossing, contact the appropriate railroad company and regulatory agency to determine if there are any special requirements. Crossings shall be discussed with must be approved in writing by the City's Engineer. In the event the City of Denton Design Criteria are more stringent than those of the Railroad Company or regulatory agency, the City's standards shall apply. Crossing locations must be easily and directly accessible on each side of the railroad. Additional access easements and installation of all-weather road surface may be required. The City of Denton shall have final say in the location, criteria and standards of railroad crossings considering access, maintenance and repairs.

6.3.13 Creek Crossings

When a sewer main crosses a creek or channel, the design engineer must evaluate the condition of the creek bed and ensure erosion control is provided. Backfill material and minimum construction criteria are shown in the City of Denton Standard Details S701 and S702. These criteria include creek bed soil and condition, as well as presence of exposed rock. When working in these areas, minimize storage of soil, materials, and equipment near floodways and waterways. Crossing locations must be easily and directly accessible on each side of the creek. Additional access easements and installation of all-weather road surface may be required. The City of Denton shall have final say in the location, criteria and standards of creek crossings considering access, maintenance and repairs.

A. Siphons

For creek or channel crossings where a Low-Water Channel Crossing is not feasible, design of an inverted siphon crossing is permissible when approved by the City's Engineer through a design deviation request. Inverted siphons shall not have less than two (2) barrels, with a minimum pipe size of eight (8) inches, and shall be provided with necessary appurtenances for convenient flushing and maintenance. Access structures are required at each end of the siphon, with adequate clearance for maintenance and cleaning purposes. Bank and channel stabilization may be required to protect the crossing lines and casing of the carrier pipe may be required to meet environmental or other restrictions. Siphon locations must be easily accessible on each side of the creek by heavy equipment for maintenance. Additional access easements and installation of all-weather road surface may be required. The City of Denton shall have final say in the location, criteria and standards of creek crossings considering access, maintenance and repairs.

6.3.14 Tunneling, Borings, Jacking, and Casing

Force main tunnels and bores shall follow the same requirements as are laid out for water mains in Section 6.2.16 of this Manual.

6.3.15 Abandonment of Sewer Mains

A. The design engineer should note the limits and appropriate conditions for the abandoning of existing wastewater mains which are to be replaced by the construction of any proposed wastewater mains.

B. The design engineer should also make allowances in the design to provide for the existing and proposed mains to be in service simultaneously until all customer services are transferred from the old main to the new main with minimum interruption of service. If the construction of a proposed main necessitates the abandoning of the existing main prior to the new main's placement into service, then provisions for a temporary wastewater main with services must be addressed by the design.

C. Typically, abandoned lines may be left in place with only the ends being plugged with grout or concrete. However, the City may require special abandonment actions including, but not limited to, filling the abandoned wastewater main with grout, removal and proper disposal of all above ground appurtenances, and removal and proper disposal of the abandoned pipe. In situations where a manhole is being left in service even though one (1) or more lines into the manhole are being abandoned, the abandoned line shall be cut and plugged outside of the manhole. However, if the City determines that the pavement is in good condition the City may allow the abandoned line to be plugged from inside of the manhole.

6.3.16 Abandonment of Manholes

If a manhole as well as the sewer main is to be abandoned, the method described in ***Abandonment of Sewer Mains***, above, along with the minimum guidelines shown in Drawing S105 of the City Standard Details, shall be used.

6.3.17 Lift Stations

The need to construct a lift station should be determined only after a thorough analysis of the physical and economic factors involved. A Preliminary Engineering Report is required, which lists all factors and adheres to current state regulations. The City reserves the right to review each proposal and determine whether there is enough merit to justify a lift station. Any lift station located in the City of Denton CCN must adhere to these requirements.

A. Preliminary Design Submittal

A preliminary design submittal is required for each lift station proposed. The submittal shall include a written report and a map prepared by a Professional Engineer, licensed by the State of Texas.

1. The plans submitted shall contain the following information, at a minimum:
    a. Be to scale, with the scale indicated;
    b. A north arrow;
    c. A location map;
    d. Delineation of the boundary of the proposed development;
    e. Delineation of the boundary of the sewershed in which the development lies;
    f. The area in acres of the development;
    g. The area in acres of the sewershed contributing to the lift station;
    h. The proposed land use or uses for the development;
    i. The proposed land use or uses for the sewer basin;
    j. The proposed lift station site, along with the GPS coordinates;
    k. The proposed force main routing and size;
    l. Delineation of the 100-year flood plain and ESAs;
    m. Location and size of the existing collection system at the tie-in point;
    n. Contour lines (2-ft. intervals);
    o. Show how storm drainage is taken off site; and
    p. Property lines.
2. The written report shall include the following information:
    a. A general narrative about the proposed development and the circumstances that warrant a lift station, including a phasing plan detailing the utilization and station limitations from initial flow to buildout;
    b. Influent hydraulic calculations showing:
        i. Area in acres of the sewer basin and the development;
        ii. The area of each proposed land use for the development and for the projected land use(s) for the basin;

iii. The design flow for the basin and the development;

iv. The peak flow for the basin and the development;

v. Elevation of the proposed lift station site; and

vi. The elevation of the proposed discharge point of the force main.

c. Preliminary wet well volume calculations;

d. Preliminary force main size;

e. Cost estimates for proposed lift station(s) and force main(s), and cost estimates for a gravity line in lieu of the lift station if possible;

f. Ground water levels included in a comprehensive geotechnical report for the proposed site areas; and

g. A copy of the summary transmittal letter to TCEQ showing agency approval of proposed plans.

B. Site Layout

1. Station Siting:

The following are the minimum criteria for station sites:

a. The station shall be protected from the 100-year flood and shall be accessible during a 100-year flood;

b. The station should be located as remotely as possible from populated areas. The entire station site shall be completely enclosed with an 8-ft. high, opaque concrete or masonry wall, with an opaque sliding gate with a minimum width of 16 feet on track flush with the ground. All shall be of an architectural style and colors blending with the development architecture, as approved by the city;

c. The lift station site shall be large enough to allow the construction of the lift station to serve the upstream basin(s), and its replacement while maintaining active service without a bypass;

d. The station site must have verified radio communication ability with the City's central Supervisory Control and Data Acquisition (SCADA) antenna location;

e. The station shall have a minimum 16-ft. wide drive approach and be accessible by City of Denton service trucks, without requiring vehicles to turn after entering the drive approach to the station;

f. The station will include an approved odor-control system;

g. The station site and its access shall be dedicated as a separate lot to the City, as City property;

h. The station site cannot be located within the boundaries of any private entity intended to regulate property including, but not limited to, HOAs, COAs, and POAs;

i. The station site shall be located so it may serve as much as the entire sewer basin as possible. This may require the station to be located off-site of the development. When it is required that the station serve a larger area than the proposed development, the developer may enter into a pro-rata contract with the City to be reimbursed the cost of excess capacity as other developments tie to the system; and

j. The on-site generator must have an unobstructed 36-in. buffer on all sides and be accessible by City service vehicles.

2. Wet Well/ Dry Well Arrangement

a. Orientation shall consider the routing of incoming sewers and force main;

b. Orientation shall allow at least a 2-ton vehicle to directly access the wet well or the dry well, forwards and backwards or larger vehicle as appropriate;

c. Wet wells and dry wells shall be separate structures;

d. Wet wells shall have sloped bottoms to avoid excess sludge deposits;

e. The wet well shall have a lockable aluminum door with an aluminum frame and safety grating. The minimum opening size shall be 4-ft. x 6-ft. with two (2) doors large enough to adequately maintain the wet well. Door and frame shall be Bilco Type K, KD or an approved equal;

f. The dry well or valve vault shall have a lockable aluminum door with an aluminum frame and safety grating. The minimum opening size shall be 2-ft. x 3-ft. or large enough to adequately maintain the dry well or meter vault. Door and frame shall be Bilco Type K, KD or an approved equal;

g. The wet wells, dry wells, manholes, valve vaults and meter vaults, including decks, shall all be cast-in-place concrete only. No other materials are acceptable. *See* City Standard Specification 33 05 64 Concrete Wet wells, Valve Vaults, and Appurtenances for Lift Stations;

h. The coating for the wet well exterior and interior walls shall be coated as specified in Specification 33 05 64 Concrete Wet wells, Valve Vaults, and Appurtenances for Lift Stations;

i. The wet well shall be hydrostatically tested to the top of the wet well for 48 hours prior to placing the lift station into service. Only losses due to evaporation will be acceptable; and

j. Provisions shall be made to remove water from the dry well, valve vault or without allowing gas or water from the wet well into these structures.

3. Site Access

a. Access will be provided by concrete entrance and pad for aesthetics and ease of maintenance;

b. Access shall be functional during a 100-year flood. The road surface shall be above the water level caused by a 100-year return period storm;

c. Every station more than 100 feet from a public street requires a turn-around adjacent to the lift station, sized large enough to accommodate a City service truck with generator;

d. The equipment rack shall not obstruct vehicle access to the wet well or the dry well; the location must be approved during the review process. It shall be placed at an easily accessible elevation and include a canopy; and

e. Site inside the fence shall be an all-weather surface, such as ¾-in. crushed rock or flex-base.

4. Passive Ventilation

   a. Passive ventilation shall be screened to prevent insect access to the wet well or any vaults where ventilation is required. Minimum diameter of air vents shall be four (4) inches. Vent outlet shall be at least one (1) foot above the 100-year flood elevation. The passive ventilation system must be sized to vent at a rate equal to the maximum pumping rate of a lift station, but not to exceed 600 fpm through a vent pipe.

C. Hydraulic Design

For influent flow, the preliminary design report shall include the design flow and the peak flow for the development and the sewer basin. The design flow shall be calculated in accordance with TCEQ rules. Refer to Section 6.3.1 - Estimated Wastewater Flows herein for peak flow calculations.

1. Pump Capacity

   a. Firm pumping capacity is the pumping capacity of the station with the largest pump out of service.

   b. The firm pumping capacity shall be greater than the peak flow for the entire sewer basin. If the sewer basin is significantly larger than the proposed development and it is not feasible to design for this flow, the firm pumping capacity may be designed to handle a portion of the basin with approval from the City's Engineer.

   c. The pump curves shall be selected so the pumps will run near the best efficiency point during normal operating conditions. The selected curves shall also be such that the pumps do not approach shut-off head when they are running simultaneously.

   d. System head curves, pump curves and head calculations shall be submitted. Calculations and pump curves at both minimum (all pumps off) and maximum (last normal operating pump on) static heads, for a C value of both 100 and 140, must be provided for each pump and for the combination of pumps with modified pump curves.

2. Wet Well Volume

   a. Wet well volume for a submersible pump station is the volume contained above the top of the motor, or as specified by the pump manufacturer, to the bottom of the influent pipe. TCEQ Rule §217.60(b)(4) (d) A gravity pipe discharging to a wet well must be located so that the invert elevation is above the liquid level of a pump's "ON" setting.

   b. Wet well volume for all other non-submersible pump stations is the volume contained in an area from a minimum of two (2) feet above or distance at which vortexing does not occur above the top of the intake of the pump.

   c. High level alarm elevation shall be a minimum of 48 inches below the top of the wet well or 48 inches below the flow line elevation of the lowest influent pipe, whichever elevation is lower. Wet well volume shall be calculated by the following method:

$$\mathbf{T = V/(D - Q) + V/Q} \qquad \mathbf{[Eqn.\ 6.4]}$$

Where: T = Total time between successive pump starts in minutes (operating cycle)
D = Rated pump capacity (in GPM)
V = Storage volume between lead pump on and pump off elevations (in gallons)
Q = Inflow to wet well (in GPM)

Note: The operation cycle 'T' shall not be less than 10 minutes for Average Flow and not more than 60 minutes for Minimum Flow conditions.

d. Per TCEQ Rules, 30 TAC § 217.63:

i. Systems for preventing the discharge of wastewater must operate for a duration at least equal to the longest power outage on record for the past 60 months, or at least 20 minutes, whichever is longer. The design must be based on peak flows, inflow, and infiltration. If the longest power outage on record for the past 60 consecutive months is greater than 48 hours and generators will be used to provide backup power, then the owner must have a contract in place that guarantees fuel supply during an emergency. The owner must also have sufficient storage capacity at the wastewater treatment facility for the fuel required for the duration of the emergency.

ii. For calculation purposes, the owner must assume that the lift station wet well is full to the pump activation level when the power outage period begins.

3. Force Main Capacity

a. Force main capacity shall be sized to meet the capacity of the entire sewer basin. The force main may be designed to handle a portion of the basin with approval from the City's Engineer.

b. The minimum force main size shall be four (4) inches in diameter, except for Grinder Pump lift stations.

c. The minimum recommended velocity is three (3) fps, and the velocity shall not be less than two (2) fps when only the smallest pump is in operation.

d. The maximum velocity through a force main shall not be more than six (6) fps and will require confirmation per 30 TAC §217.67 that the pipeline will not fail.

D. Pumps

Pump specifications are listed in the City of Denton Specification 33 25 02 Sewage Pumps. Substitutions or deviations from the list of acceptable pumps requires the approval of the City's Engineer. The number of pumps must comply with 30 TAC § 217.61(e). If pumps are to have a variable capacity, Variable Frequency Drives (VFDs) are to be specified. Stations requiring three pumps must be equipped with VFDs on at least two of the pumps.

E. Mechanical

1. Force Mains

a. Force mains shall be laid to City of Denton Standard Specifications.

b. Plans shall include plan and profile for the force main, including valves every 2,000 feet per 30 TAC § 217.67.

i. Valves must be resilient wedge gate valves and conform to the Section 33 14 20 Resilient Seated (Wedge) Gate Valves of the City of Denton Standard Specifications;

ii. Valves must be in a manhole and conform to Section 6.3.10 of this criteria manual and Section 33 05 61 Cast-In-Place Concrete Manholes of the City Standard Specifications; and

iii. The force main shall have an isolation valve immediately downstream of the flow meter vault.

2. Lift Station Interior Piping

   a. Piping inside the lift station shall be ductile iron meeting AWWA C-150 and C-151. All fittings shall be ductile iron meeting AWWA C-110 or C-150. Interior of the pipe and fittings shall be lined with American Polybond Plus, which consists of a primer layer of 5 mils thick fusion bonded epoxy and 55 mils thick of modified DuPont Fusabond Polyethylene, or approved equal.

   b. All nut and bolt assemblies potentially exposed to sewer gases shall be ASTM 316 stainless steel.

3. Isolation Valves

   a. Each pump shall have one (1) isolation valve downstream of the pump, in a separate vault.

   b. Isolation valves shall be resilient seat gate valves or plug valves meeting the City of Denton Standard Construction Specifications.

4. Check Valves

   a. Check valves shall be controlled closing swing check valves with a lever arm or a ball check. There must be at least 15 feet of vertical head downstream in order to use a ball check valve.

   b. A check valve shall be located upstream of the isolation valve in a separate vault.

   c. All nuts and bolts shall be stainless steel.

5. Air Release / Vacuum Valves

   a. Air release valves of a type suitable for wastewater service shall be installed along the force main where the force main would be prone to trapped air.

   b. The type of valve shall be a combination of air release and vacuum breaker (see Drawing S803 on Sheet 6 of the City Standard Details). The design engineer shall determine the type and location, subject to approval of the City's Engineer.

   c. Calculations for valve type and valve sizing shall be provided to the City.

   d. Locations of the air release/vacuum valves shall be shown on the plan and profile sheets for the force main.

   e. Air release valves along the force main outside of the lift station site must be located in a vault as shown in Standard Details.

   f. Air release valves within the lift station valve vault shall have air vents plumbed to the vault drain.

6. Generators

   a. On-site generators shall be installed to serve as the source of back-up power for lift stations. They must be sized for 125% of the largest pump motor, plus 100% of the additional pump motors and other loads.

   b. Generators shall be mounted on a concrete foundation designed to handle the weight of the generator.

   c. Generators shall use diesel for fuel unless explicit written permission is granted to use a

different fuel.

d. Electrical receptacles for a mobile load bank shall be provided in the electrical design.

e. Generators rated for 500KW or more shall be provided with a permanent load bank situated to adequate dissipate the heat generated on the lift station site.

f. Generators shall be furnished with sound attenuation appropriate for the location.

7. Hoists

Station designs that exceed or are likely to exceed the lifting capabilities of the existing City Water Reclamation service trucks are to provide permanent onsite hoists rated for the lifting of the heaviest assembly in the wet well, considering rag accumulation.

F. Electrical, Instrumentation, and Supervisory Control and Data Acquisition (SCADA) Requirements

1. In accordance with the Lift Station Instrumentation and Control Panel Build Agreement, the contractor building the lift station is required to utilize a pre-approved vendor from the City's current list to perform the specified Instrumentation and Controls (I&C) and SCADA work. The selection of the vendor for a specific project will be made during the pre-construction phase and will be based on vendor availability and project requirements.

2. Provide a radio pathway study showing line of sight from the lift station to the receiver at Pecan Creek Water Reclamation Plant.

3. Sites equipped with Variable Frequency Drives (VFDs) shall provide a climate-controlled building for housing all electrical and electronic equipment.

4. Adequate lighting of the lift station wet well, valve vault, pump control equipment, electrical and instrumentation equipment shall be included with the station design. All lighting provided should be LED lighting.

6.3.18 Low-Pressure or Alternative Collection Systems

Low pressure collection systems may be allowed with specific approval by the City's Engineer.

6.3.19 Wastewater Treatment Plants, And Peak Flow Detention Facilities

If wastewater treatment plants or peak flow detention facilities are needed to support a development, the design shall be directed by the Water Utility considering the needs of the development and the Wastewater Utility System.

6.3.20 On-Site Sewage Facilities

A. General

Planning, design and operation of on-site sewage facilities within the City of Denton must comply with the current 30 TAC Ch. 285 for On-Site Sewage Facilities, as amended. The property owner proposing to use an on-site sewage facility shall comply with the criteria listed in this Section, and Section 7.6.16 of the City of Denton DDC, as amended.

B. Permits Required

Any owner of a residential, commercial, or institutional building who utilizes an on-site sewage facility is required to secure a permit from the City of Denton to construct, alter, repair, or extend

an on-site sewage facility regardless of the size of the lot or tract of land. Contact the Environmental Services Department at the Pecan Creek Water Reclamation Plant for details on permit fees and maintenance requirements.

C. Site Evaluations

A Professional Engineer or a professional sanitarian, licensed by the State of Texas, must perform site evaluations.

D. Planning Requirements

A Professional Engineer or a professional sanitarian, licensed by the State of Texas, must prepare on-site sewage facility plans.

E. On-Site Sewage Facility Land Use Requirements

Lots or tracts of land where an on-site sewage facility is proposed must have the following minimum area size.

1. A minimum of one (1) acre when a public water system serves the tract or lot; and
2. A minimum of two (2) acres when a private water well is located on the tract or lot.

6.3.21 Pretreatment Device: Grease Interceptors / Grit Traps / Oil Separators

A. General

Planning, design, and operation of pretreatment devices within the City of Denton must comply with the most current City of Denton Plumbing Code, Chapter 28; Article VII; Section 28-56, as amended. The property owner proposing to use and operate a grease trap shall comply with the criteria listed in this Section and abide by required responsibilities outlined in City of Denton Code of Ordinances Chapter 26; Article XII – Liquid Waste.

Definitions can be found in the City of Denton Code of Ordinance, Chapter 26, Article XII, Section 26-306 and Chapter 26, Article V, Section 26-154.

B. Applicability

Any user of the publicly owned treatment works (POTW), as defined by Section 26-154, and meeting the definition of "generator," as defined by Section 26-306, shall be required to install a pretreatment device in accordance with locally adopted plumbing codes as amended. Food service establishments shall not share grease interceptors unless specifically authorized by the City's Engineer.

These requirements are applicable to all commercial food service establishments, including those that are undergoing:

1. New construction
2. Interior remodeling to accommodate expansion or operational modifications
3. Changes of ownership/occupancy
4. Facilities which fail to meet limitations outlined in article V, Chapter 26 of the Code of the City of Denton, Texas
5. When discharges which may cause blockages in the wastewater collection system

C. Review Required

Plumbing plans for new facilities must be prepared by a plumber or a Professional Engineer, licensed by the State of Texas, and submitted as a part of the development process. These plans

must show the fixtures draining into the pretreatment device. Plans must also include the flow-through rating of the pretreatment device as well as the grease or solids retention capacity and, the location of the down-stream sampling port. Plumbing plans for existing facilities must be submitted when applying for a certificate of occupancy. These plans must show the fixtures draining into the pretreatment device and indicate the flow through rating and grease and solids capacity of the pretreatment device.

D. Construction/Installation

All permitting, construction, and inspection activities must be completed in accordance with the City of Denton Plumbing Code Chapter 28. Additionally, the following specifications must be incorporated into grease trap design.

1. The grease interceptor shall be constructed with a minimum of two baffles. Each manhole access shall be minimum 20-in. diameter clear opening.
2. Grease traps are to be installed at a minimum distance of 10 feet from sinks and dishwashers to allow for adequate cooling of the wastewater. Water temperatures must be less than 120 degrees prior to entering grease trap.
3. Pretreatment devices shall be constructed of a material that is compatible with the type of waste generated by the Facility and treated by the device.
4. All grease bearing waste streams should be routed through an appropriate grease trap/interceptor, including: three-compartment sinks, pot/pan sinks, soup kettles, hand-washing sinks, automatic dishwashers, mop sinks and floor drains.
5. Any pretreatment device must have a sample port allowing for the instantaneous grab sampling of the effluent of the device. The sample port must be solely representative of the process wastewater and sanitary tie-ins must be done down-stream of the sampling port. The proposed sampling port must allow for a wide-mouthed 250-mL amber glass bottle to be submerged or partially submerged into the effluent. Interior, above-ground hydromechanical grease interceptors with a liquid capacity of 100 gallons or less may install a sample spigot with a ball valve in leu of a sample port due to space constraints with city approval. The sample spigot must be solely representative of the process wastewater and sanitary tie-ins must be done down-stream of the sample spigot. Sample wells will have a minimum 12-in. diameter access cover. Mechanical Traps and Interceptors that are installed above ground must be equipped with an influent flow regulator and an effluent valve assembly that allows for sample collection.

Unless otherwise approved in writing by the City's Engineer, all fixtures, equipment, and drain lines located in the food preparation, alcohol service, clean-up, and food service areas of a food service establishment shall be connected to a grease interceptor. Fixtures required to connect to a grease Interceptor shall include but are not limited to pot sinks, pre-rinse sinks, hand sinks, prep sinks, dishwashers, soup kettles, braising pans, wok ranges, mop sinks, floor sinks, floor drains, and wastewater generated from exhaust fan hood cleaning operations.

E. Grease Interceptor Sizing Requirements

Sizing methods described herein are intended as guidance in determining grease trap/interceptor sizes that will afford the City's sanitary sewer system a minimum degree of protection against grease and other obstructing materials. Sizing determinations are based on operational data provided by business owners or their contractors. In approving a customer's plumbing or grease interceptor design, the City does not accept liability for the failure of a system to adequately treat wastewater

to achieve effluent quality requirements specified under City of Denton Code of Ordinance Chapter 26. It is the responsibility of the generator and/or contractors to insure the appropriate level of treatment necessary for compliance with environmental and wastewater regulations.

1. Gravity Grease Interceptors (GGI) shall meet the requirements of ASME A112.14.6 and IAPMO/ANSI Z1001. The required capacity of gravity grease interceptors shall be determined by multiplying the peak drain flow into the interceptor in GPM by a retention time of 30 minutes as required by the International Plumbing Code.

2. Hydromechanical Grease Interceptors (HGI) shall be designed and tested in accordance with ASME A112.14.3 and/or CSA B481.1. Sizing shall be in accordance with HGI Sizing and Selection, as shown in the following two-step process:

   a. Step 1: Size by Flow Rate

      The minimum flow rate for HGIs may be calculated by either using pipe diameter or fixture volume using either a one-minute or two-minute drainage period. Use a one-minute drainage period when the interceptor will be installed inside of the building and has indirectly connected fixtures. When the interceptor will be installed outside of the building, use a two-minute drainage period.

      i. Fixture Volume Sizing

         Use the following formula for sizing fixtures by volume with a 75% fill factor:

         Fixture Capacity Gallons = [(L x W x H) / 231] x 0.75 [Eqn. 6.5]

         Note that,

         Fixture Capacity Gallons x 1 = one-minute drainage period (GPM)

         Fixture Capacity Gallons x 0.5 = two-minute drainage period (GPM)

         Example calculations are shown below for a three-compartment sink with each compartment dimensions being 18 x 24 x 12 inches:

         18 x 24 x 12 = 5184 cu. in.

         5184 / 231 = 22.44 fixture capacity gallons

         22.44 x 3 = 67.3 total fixture capacity gallons (three bowls)

         67.3 x 0.75 = 50.4 total fixture capacity after loading factor (75%)

         50.4 x 1 = 50 GPM one-minute drainage period

         50.4 x 0.5 = 25 GPM two-minute drainage period

         To determine the minimum required flow rate for the HGI, calculate the capacity of each fixture that will be connected and add the volumes together and use the appropriate drainage period. An appropriate HGI must be certified to meet the minimum flow rate as calculated.

   b. Step 2: Calculate Grease Capacity

      Once the minimum flow rate has been established as detailed in Step 1, the minimum grease storage capacity for the HGI required for the desired pump-out frequency is calculated as follows:

      Grease Capacity Needed = Meals per day x GPV x DPC [Eqn. 6.6]

      Where: GPV = Grease Production Values (See Table 6.3E below)

      DPC = Days per Pumpout Cycle [Recommended 90 days]

Table 6.3-E: Grease Productions Values for Typical FSEs

Menu	w/o Fryer, No Flatware	w/o Fryer, Flatware	w/ Fryer, No Flatware	w/ Fryer, Flatware
Bakery	0.035	0.0455	0.035	0.0455
Bar - Drinks Only	0.005	0.0065	0.025	0.0325
Bar and Grille	0.035	0.0455	0.035	0.0455
BBQ	0.035	0.0455	0.035	0.0455
Buffet	0.035	0.0455	0.035	0.0455
Burger Joint	0.025	0.0325	0.035	0.0455
Cafeteria - Full Serve	0.035	0.0455	0.035	0.0455
Cafeteria - Heat & Serve	0.025	0.0325	0.035	0.0455
Chinese	0.035	0.0455	0.035	0.0455
Coffee Shop	0.005	0.0065	0.025	0.0325
Continental breakfast	0.005	0.0065	0.025	0.0325
Convenience Store	0.005	0.0065	0.025	0.0325
Deli	0.005	0.0065	0.025	0.0325
Donut Shop	0.005	0.0065	0.035	0.0455
Don't know yet	0.035	0.0455	0.035	0.0455
Family Restaurant	0.035	0.0455	0.035	0.0455
Fast Food - Limited Prep	0.025	0.0325	0.025	0.0325
Fast Food - Full Prep	0.035	0.0455	0.035	0.0455
Fried Chicken	0.035	0.0455	0.035	0.0455
Greek	0.035	0.0455	0.035	0.0455
Grocery Store	0.035	0.0455	0.035	0.0455
Ice Cream/Yogurt/Smoothies	0.005	0.0065	0.025	0.0325
Indian	0.035	0.0455	0.035	0.0455
Italian	0.035	0.0455	0.035	0.0455
Mexican	0.035	0.0455	0.035	0.0455
Pizza Restaurant	0.025	0.0325	0.035	0.0455
Pizza Carryout	0.005	0.0065	0.025	0.0325
Multi-unit dwelling	0.005	0.0065	0.025	0.0325
Salads / Healthy Bowls	0.025	0.0325	0.025	0.0325
Sandwich Shop	0.005	0.0065	0.025	0.0325
Seafood	0.035	0.0455	0.035	0.0455
Snack Bar	0.005	0.0065	0.025	0.0325
Steak House	0.035	0.0455	0.035	0.0455
Sushi	0.005	0.0065	0.025	0.0325

Notes:
[1] To determine the correct grease factor, select the menu type, then the correct column for whether there is a fryer and whether the establishment uses disposable or washable plates, glasses, knives, forks, and spoons (flatware).
[2] FSEs that are not open every day, may calculate the number of days open in a 90-day period and use that to calculate the total amount of grease capacity required and must submit calculation for review.

Source: Brown Grease Supply Study, 2011, Kennedy/Jenks Consultants.

Example calculations are shown below for a Fast Food – Full Prep, with fryer, with disposable flatware, serving 300 meals per day:

Grease factor from Table 6.3E = 0.035 pounds per meal
Meals per day = 300
Days between pump-outs = 90
Grease Capacity Needed = 0.035 x 300 x 90 = 945 pounds

The correctly sized and selected grease interceptor will have the minimum flow rate determined in Step 1 and the grease storage capacity calculated in Step 2. Grease interceptors certified to meet the minimum requirements of ASME A112.14.3 or CSA B481.1 shall have the flow rates and minimum grease storage capacities as listed in Table 6.3-F below:

Table 6.3-F: Minimum Grease Storage Capacity for Grease Interceptors

HGI Flow Rate (GPM)	Minimum Grease Storage Capacity[1] (lbs.)
20	40
25	50
35	70
50	100
75	150
100	200

Notes:
[1] Minimum grease capacity as required by ASME A112.14.3, PDI G101 and CSA B481.

Grease interceptors claiming grease capacities exceeding the minimum requirements in Table 6.3-F, shall be reviewed and approved by the City when the manufacturer can demonstrate by third-party test reports, including the incremental test data, that the interceptor(s) has the capacity claimed. Upon approval from the City, the grease interceptors proven grease storage capacity may be used in selecting the sizes and required number of units to satisfy the requirements of the two-step sizing method in Section 6.3.21.E.2 of this Manual.

F. Laundries

Commercial Laundries, laundromats, and dry cleaners shall be equipped with an interceptor to reduce the quantity of lint and silt that enter the collection system. The system must be of adequate size and design to allow for cool-down of wastewater so that separation can be more readily achieved. The interceptor must be installed with a wire basket or similar device, removable for cleaning, that prevents passage into the drainage system of solids ½-inch (12.7 mm) or larger in size, string, rags, buttons or other materials detrimental to the public sewerage system.

G. Car Washes

Where automobiles are washed (including detail shops utilizing hand-wash practices), separators shall have a minimum capacity of 1000 gallons for the first bay, with an additional 500 gallons of capacity for every other bay.

H. Automotive Repair Facilities (Garages and Service Stations)

Where automobiles are serviced, greased, or repaired or where gasoline is dispensed, oil or water separators shall have a minimum capacity of 500 gallons for the first 1000 sq. ft. of area to be drained, plus 250 gallons for each additional 1000 sq. ft. of area to be drained into the separator.

6.3.22 Inspections Required

New installations or existing pretreatment devices must be inspected by the City of Denton Pretreatment Program prior to the issuance of a Certificate of Occupancy for new businesses.

6.4 Construction Plans

6.4.1 General

Before any public works construction relative to a development may begin, City staff will verify the construction plans have been approved. Construction may not begin until the construction plans have been approved, all materials used for public improvements have been submitted and approved, all fees (including review and inspection fees) have been paid, all necessary agreements and bonds have been provided, and a Pre-Construction Conference has been held by the City.

6.4.2 Responsibility

The sealing engineer is responsible for the accuracy, completeness, and conformance of the submitted plans to City standards. The purpose of the City review is to ensure conformance to City policies and standards. The City review is limited to facts as presented on the plans submitted. The City has no project engineering design or quality control review responsibility. The engineer of record certifying the plans is responsible for the accuracy and completeness of the plan documents. The City reserves the right to require plan corrections to fit actual field conditions or meet City standards requirements, which are found to be contrary to or omitted from the plans.

6.4.3 Format

Construction plans shall be digitally drawn on 24-in. x 36-in. size sheets with borders of 22-in. x 34-in., so half-size reproduced plans will be to half-scale fitting 11-in. x 17-in. sheets. Each sheet shall be legible when reduced to half-size. Digital copies of the plans shall also be provided.

6.4.4 Plan Requirements

Construction Plans must contain, as a minimum, information listed in the following sections before they can be approved:

A. General

North arrow, scale, date, and mean sea level elevations of all improvements, based on North America Vertical Datum 1988 (NAVD 88). Only NAVD 88 shall be used for plan elevations; no assumed or NGVD 29 elevations. Plans shall be drawn with a horizontal scale of one (1) inch equals 40 feet as a minimum, and appropriate corresponding vertical scale. The plans shall provide a reference to the elevation benchmark or monument used in the development of the plans. Show all crossings of existing and proposed underground utilities. Plans shall account for future changes in topography. The construction plans shall be signed and sealed by a Professional Engineer, licensed by the State of Texas, prior to bidding the project for construction.

B. Water Systems

Plan sheets must show the horizontal alignment of the proposed water system within street ROWs and easements, with horizontal control points for location of the ROWs and easements and for

location of the water system within the ROWs and easements. Sizing of pipe, valves, fittings and appurtenances must be shown on the plan view. All valves, fittings, fire hydrants, and other appurtenances must be stationed and given GPS coordinates (with an accuracy of ± six (6) inches) based on the City of Denton's grid coordinate system. Profile views of water mains shall be provided showing proposed grade, pipe material, casing pipe size and thickness (if any), and the location, elevation and size of any underground conduit or facility to be crossed. Deflections (if any) must be shown on the plan and profile views, as applicable, with stationing and the degree of deflection. Approved design deviations (if any) from City Standard Details must be provided. Show all service lines up to and including the meter can/vault. Service lines do not need to be stationed or have GPS coordinates. Adequate detail of other planned and existing improvements shall be shown to indicate planned crossings of utilities, storm drains, and stormwater facilities and potential conflict points.

C. Sanitary Sewer Systems

Plan sheets must show the horizontal alignment of the proposed sanitary sewer system within street ROWs and easements, with horizontal control points for location of the ROWs and easements and for location of the sanitary sewer system within the ROWs and easements. Sizing of pipe, manholes, fittings and appurtenances must be shown on the plan view. Manhole rim elevations, and pipe "IN" and "OUT" elevations must be shown. All manholes, fittings, and other appurtenances must be stationed and given GPS coordinates (with an accuracy of ± six (6) inches). based on the City of Denton's grid coordinate system. Every sanitary sewer line shall be profiled. Profile views shall show proposed grade, pipe material, casing pipe size and thickness (if any), manhole information, and the location, elevation and size of any underground conduit or facility to be crossed. Approved design deviations (if any) from City Standard Details must be provided. The plan view shall include arrows indicating direction of flow in pipe. Show all service lines to and including the public cleanout. Service lines do not need to be stationed or have GPS coordinates. Adequate detail of other planned and existing improvements shall be shown to indicate planned crossings of utilities, storm drains, and stormwater facilities and potential conflict points.

D. Grading

For situations involving proposed grading over existing water or sanitary sewer systems, provide a grading plan and profile showing the existing and proposed topography in 2-ft. contours. The grading plan shall consist of contours and spot elevations with water directional arrows to define the flow patterns.

Section 7: Streetlight Design Criteria

7.1 Overview

The purpose of Section 7 – Streetlight Design Criteria is to assist developers and engineers in creating an aesthetic, consistent, and safe lighting plan for our streets, sidewalks, and neighborhoods. This section outlines the process for design, review, and approval of new lighting projects, as well as criteria for modernizing existing lighting infrastructure. Streetlights are usually owned by Denton Municipal Electric (DME) which is a part of the City of Denton (the City), however they may be installed, operated, and maintained by DME, other electric utilities, or private owners depending on the location. This section of the DCM has been created to help navigate the process for selecting, permitting, placing, and maintaining streetlighting throughout the city. This manual does not apply to security, area, pathway, private, or other lighting not associated with a public road.

This manual cannot cover all the situations that might be encountered, required, or requested in the construction and installation of streetlighting. Any apparent discrepancy, omission, error, or requirement necessitating further explanation or interpretation should be referred to DME Engineering (940-349-7117 or 940-349-4173) for further clarification.

The goal of the criteria laid out in this Section 7 is to implement the following guiding principles into the application of street designs in the City of Denton:

A. Enhance safety of the community for pedestrians and drivers alike

B. Conserve energy by prioritizing efficient lighting design

C. Minimize impact to the environment including light pollution

D. Minimize impact to neighborhoods and residences by reducing light trespass

E. Provide for a uniform and aesthetic look throughout the city

F. Be fiscally responsible through effective application of design principles

7.1.1 Applicability

The existing streetlight installations throughout the City of Denton have been accepted as is at the time of approval of this manual. Retro-active replacements and upgrades solely for the purpose of bringing existing lighting up to the standards of this manual are not required. This manual is intended to apply to all new projects in the City beginning July 1, 2024. (This means the project has been approved/permitted by Development Services on or after July 1, 2024).

7.1.2 Organization

Section 7 – Streetlight Design Criteria is organized as follows:

A. Overview

B. Requirements

C. Developer & DME Responsibilities

7.2 Requirements

7.2.1 General

The City adheres to the guidance of ANSI RP-8 Recommended Practice for Design and Maintenance of Roadway and Parking Facility Lighting for all highways and streets *except for local residential streets with speed limits of 30 mph or less*. ANSI RP-8 acknowledges that vehicle headlights may provide adequate illumination for slower speeds when the driver has sufficient time for reaction and stopping. As per ANSI RP-8, Section 11.6.3.1 – 'When Residential Street Lighting May Not be Needed', for local residential streets (e.g., within a residential development) with speed limits of 30 mph or less, street lighting shall be placed no more than 250 feet apart. A photometric (lighting) study will be required for all new installations except for local residential streets with speed limits of 30 mph or less.

These standards shall apply to all new streetlight installations, upgrades, replacements, and conversions from the date of the adoption of these standards onward.

Easement, ROW, and permitting regulations that are not listed in this manual still apply to streetlights. The developer is responsible for knowing and adhering to any laws and regulations governing development and construction relating to the work being done.

Developers are responsible for the design, materials, and installation costs of all streetlighting on public streets within and adjacent to their project. *See* the Developer and DME Responsibilities Section of this manual for more specific descriptions of responsibilities. DME will only energize new streetlights after the installation has been approved by DME. For most lighting installations, following energization, DME will accept ownership and maintenance of streetlights unless the lighting is located on a private drive (i.e. the City has not taken ownership of the street / streetlights) or the lighting is non-standard and will not be owned or maintained by DME.

Streetlights are not normally metered. The City (or customer in certain cases) is charged a monthly usage and maintenance fee per light according to the Denton Municipal Utility Rates Manual. This does not apply to private drives and other private properties where the developer or customer chooses to install lighting other than the standard city approved options. In such cases, DME will provide a metered service point only and the customer will be responsible for all installation, maintenance, and fees associated with the lighting installation in accordance with applicable city codes, ordinances, and utility service standards for the life of the installation.

City streets and street projects will not be considered complete until adequate streetlighting has been installed, approved, and energized. For example, for the streets in a new development to be accepted by and turned over to the City, street lighting must be complete.

7.2.2 Roadway Lighting Requirements

A. Roadway Designations

To determine the proper lighting for a roadway, it is important to determine what type of vehicle and pedestrian traffic the roadway is meant to accommodate. Roadways may be classed into several different categories based on these two variables. The lighting requirements are then applied to provide adequate lighting to mitigate the risks of collision by a vehicle with another object, vehicle, or pedestrian.

Roadways may be classified as *highways and freeways, arterials, collectors,* and *local roads*. In this section of the DCM, local roads may also refer to auxiliary roadways such as *alleys, drives, dead-ends,* and *cul-de-sacs*. Local roads may be residential streets (providing direct access to homes) or other local roads providing access to businesses and connecting larger roads together. Local roads

generally have speed limits of 30 mph or less, while highways, arterials, and collectors will have higher speed limits. *Local roads* are further broken down into *residential* and *non-residential streets* in portions of this section to allow flexibility in managing light levels in residential neighborhoods. Specific road classification and design information may be found in Section 5 – Transportation Design Criteria of this DCM.

B. Lighting Evaluations and Design

For streetlighting of highways and streets, *except local residential streets with speed limits of 30 mph or less,* lighting shall be designed per ANSI RP-8. A photometric (lighting) study will be required for these new installations. ANSI RP-8 requires that a pedestrian activity classification be made to determine the required lighting levels. *See* ANSI RP-8 for further guidance on pedestrian activity classification and streetlighting design requirements. Additional information may also be found in the TxDOT Highway Illumination Manual, and AASHTO GL-7, "Roadway Lighting Design Guide". All designs adhering to ANSI RP-8 standards shall be verified and documented using appropriate lighting design software. A licensed Professional Engineer in the state of Texas shall stamp all lighting designs before each submittal.

For all local *residential* streets with speed limits of 30 mph or less, street lighting shall be installed at intersections, cul-de-sacs, and no more than 250 feet apart for the remainder of the street. Lighting may be installed along one side of the street, both sides in parallel, both sides alternating, or in the median. Separation distances should be measured along the centerline of the street. Additional lighting may need to be considered if there are obstacles or road geometries that cutoff some of the light. *See* the Sample Local Residential Streetlighting Layout shown below in Figure 7.1.

When designing or adding streetlights to existing roadways and/or neighborhoods, consideration should be given to the style and placement of any existing fixtures. New streetlighting shall be chosen from the available styles that most closely matches the style of the existing lighting in the area. Historic poles are only approved for specific applications and areas designated as historic districts or within the Downtown Implementation Plan area.

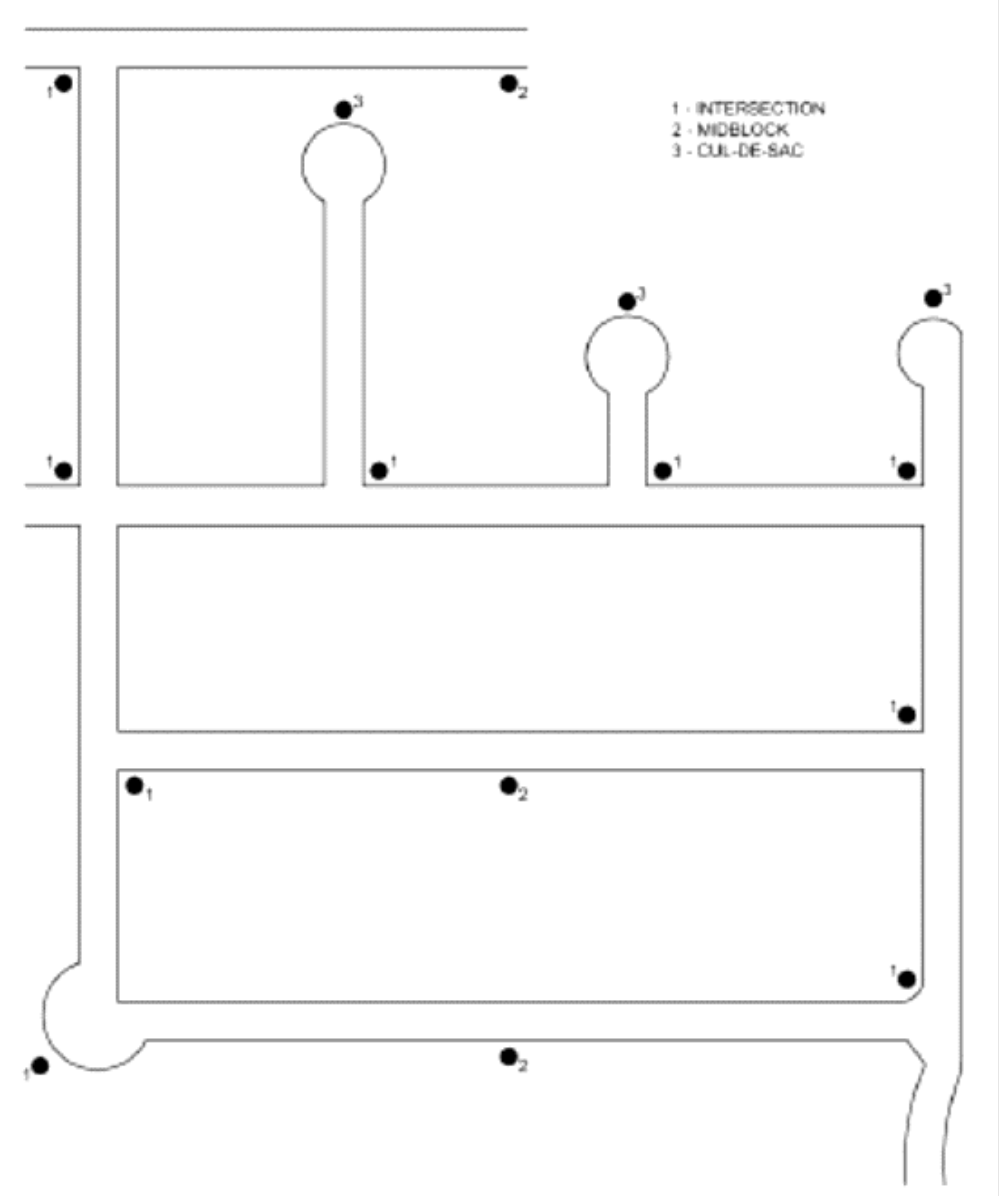


Figure 7.1 Sample Local Residential Street Lighting Layout

(Lights are shown at intersections, cul-de-sacs, and mid-block

when spacing between lights exceeds 250 feet)

C. Intersection and Crosswalks

Intersections have a much higher number of potential conflict points as vehicles and pedestrians are permitted to cross through normal lanes of traffic. Therefore, additional care is needed when planning intersection lighting. ANSI RP-8 should be used to design lighting at intersections for larger, busier streets as stated previously. *See* Figure 7.2 shown below.

Because of the additional safety concerns for vehicles, cyclists, and pedestrians at crosswalks and intersections, the following examples (taken from ANSI RP-8) are provided to assist streetlight design for local streets. While not strictly required, they should be considered as good lighting practice for these types of locations.

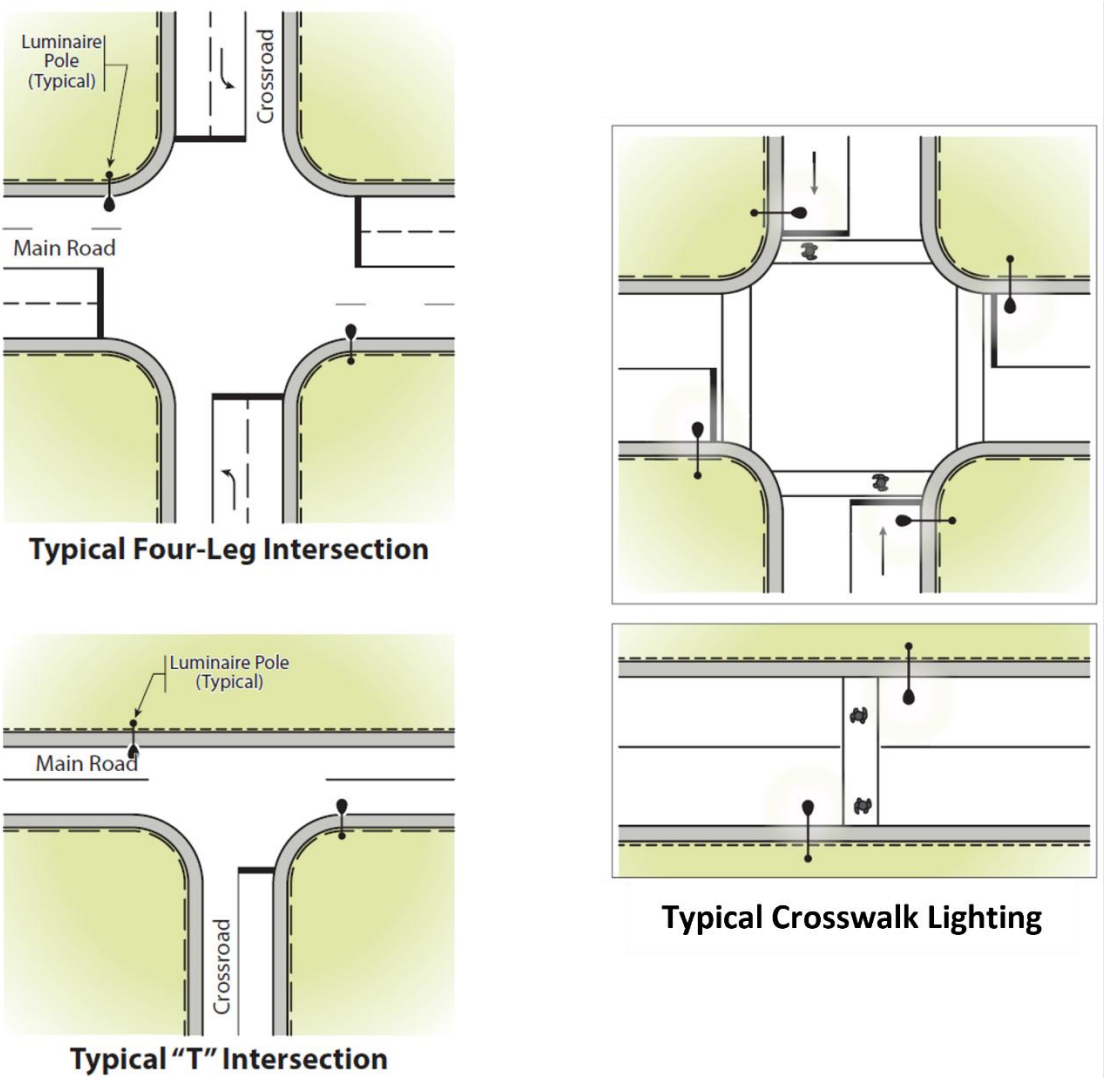


Figure 7.2 Typical Lighting Schematic for Intersections

D. Roundabouts and Traffic Circles

Like intersections, roundabouts and traffic circles have a higher number of potential conflict points than normal streets. ANSI RP-8 should be used to design lighting at traffic circles and roundabouts of larger streets. For local streets, an example of round-about lighting design considerations is shown below. Some locations may not require as much lighting as shown depending on the size of the traffic circle. *See* Figure 7.3 shown below.

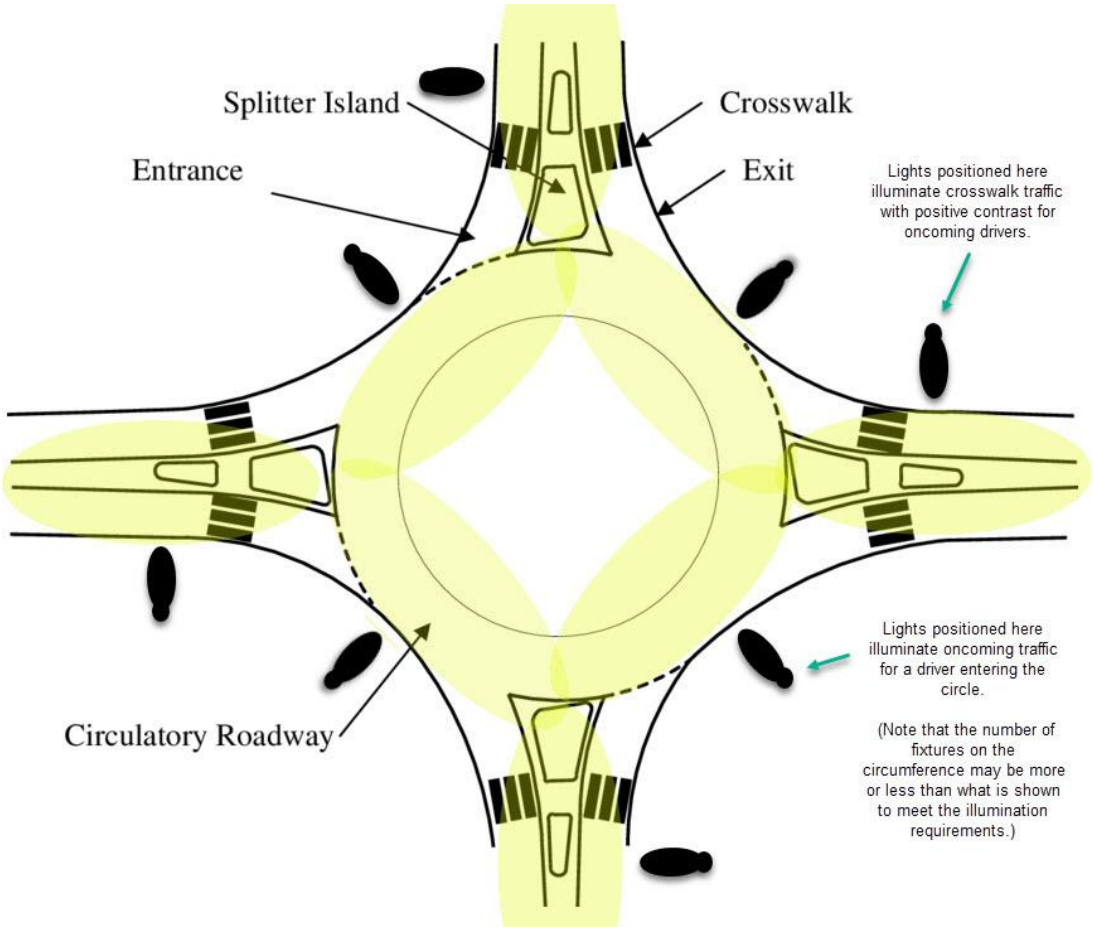


Figure 7.3 Roundabout Lighting Placement Schematic

E. Railroad Crossings

Railroad crossings are slightly different than normal intersections and require lighting adjustments accordingly. It is of course, vitally important that drivers are able to see a train that is crossing, and conversely, that the train engineer has a clear picture of any obstructions while approaching an intersection. Street lighting at railroad crossings should therefore illuminate the intersection while not causing glare for the drivers or train engineer. The following figure illustrates the recommended lighting placement for a railroad crossing. *See* Figure 7.4 shown below.

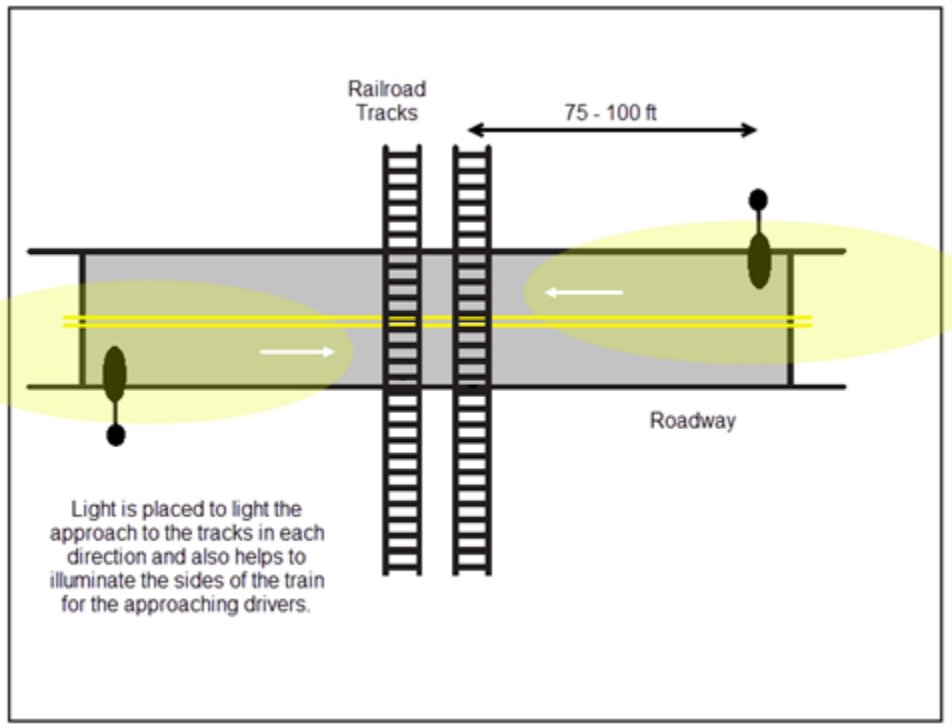


Figure 7.4 Railroad Crossing Schematic

7.2.3 Installation Requirements

A. Placement

1. Highways and Streets (except for local residential streets with speed limits of 30 mph or less)

   Installation should follow TxDOT recommendations in the TxDOT Highway Illumination Manual. Where TxDOT requirements do not apply, the streetlight system shall be installed in the ROW or within public utility easements and poles should be placed approximately 2.5 feet back from curbs and 10 feet back from edge of paving for uncurbed roads or, where there is sidewalk abutting the curb, approximately 1 foot behind the sidewalk. Deviations of more than 1 foot in either direction from these requirements must be approved by DME Engineering.

2. Local Residential Streets (speed limits of 30 mph or less)

   The streetlight system shall be installed in the ROW or within public utility easements. Poles should be placed approximately 2 feet back from the curb of 10 feet from un-curbed pavement. If a sidewalk abuts the curb, then the pole should be placed approximately 1 foot behind the sidewalk. In a residential neighborhood, streetlights should be placed within 5 feet of common property lines (e.g. between neighbors).

B. Vertical and Horizontal Clearance

New streetlights should not interfere with existing structures or rights-of-way, including sidewalks, nor should the placement preclude the ability to perform maintenance on the pole in a safe manner. *See* National Electric Safety Code (NESC) section 234 for specific clearances required for overhead

electric installations. The exception to this requirement is when streetlight arms are mounted directly to wooden distribution poles.

Proposed trees should be located at least 25 feet from any streetlight location. When installing new lights in a location with existing trees, consideration should be given to the age and maturity of the tree and whether it will interfere with the light when it is fully grown. DME will be responsible for tree trimming around streetlights to preserve the integrity of streetlighting as needed.

Median-mounted poles should be installed at least 20 feet back from an intersection to minimize the number of vehicle-streetlight collisions due to vehicles and trucks turning too sharply at the intersection.

In areas predominantly served by overhead electric powerlines, streetlights are usually installed by attaching streetlight arms to existing wood distribution poles. Care should be given when planning for lighting in these areas as overhead lines pose a conflict when placing new lighting poles. Clearances must be maintained for safety. Redesign/relocation of existing overhead power lines just to accommodate lighting is costly and time consuming. Utilizing existing wood pole locations and installations on the opposite side of the street are two ideas for additional placement options in these areas.

C. Approved Fixtures and Materials

The approved streetlight components for each class of roadway are listed below in Tables 7.2-A and 7.2-B.

Table 7.2-A: Approved Luminaires and Hardware by Location

	ROADWAY CLASSIFICATION					
	HIGHWAYS AND FREEWAYS (UNLESS OTHERWISE SPECIFIED BY TXDOT)	**ARTERIALS AND LARGE COLLECTORS**	**ALTERNATE ARTERIALS AND COLLECTORS**	**COLLECTORS AND LOCAL STREETS**	**EXISTING RESIDENTIAL LOCAL STREETS (ALSO USED IN HISTORIC DISTRICTS)**	**NEW RESIDENTIAL LOCAL STREETS (≤ 30 MPH)**
Make	Signify Lumec RFL	Signify Lumec RFM	Gardco Optiform M	Signify Lumec RFM	Hadco	Gardco
Model	RFL-241W112LED-4K-G2-R2M-UNV-DMG-ML-RCD7-API-GY3	RFM-160W48LED-4K-G2-R2M-UNV-DMG-ML-RCD7-API-GY3	OPF-M-A10-840-2TM-MAR-UNV-TR7-DGY	RFM-85W24LED-3K-G2-R2M-UNV-DMG-ML-RCD7-API-GY3	C-1891P RL34AANN2A SNR7WA3 NNNNSP1	OPF-S-P05-730-T2M-AR1-UNV-SP2-TR7
Wattage	241W LED	160W LED	112W LED	85W LED	69W LED	66W LED
Lumens	30,188	19,489	20,357	8,753	7,734	11,253
Color Temperature	4000k	4000K	4000K	3000K	3000K	3000K
Light Distribution Type	Type II	Type II	Type II	Type II	N/A	Light II
Voltage	120 – 277V or 347 – 480V	120 – 277V or 347 – 480V	120-277V	120 – 277V or 347 – 480V	120 - 277V	120 – 277V
B-U-G Rating	B4-U0-G4	B3-U0-G3	B3-U0-G3	B3-U0-G3	B2-U5-G4	B2-U0-G2
Pole Type	Steel, white concrete, or wood	Steel, white concrete, or wood	Dark Gray Steel	Steel, white concrete, or wood	Residential - Concrete aggregate Historic – Cast Aluminum	Steel, square, gray
Globe Type	N/A	N/A	N/A	N/A	Hadco, RL34 Acrylic Victorian	N/A
Arm Type	8-ft. metal (specs depend on pole type)	8-ft. metal (specs depend on pole type)	8-foot metal	8-ft. metal (specs depend on pole type)	N/A	Std-mount, no arm

Table 7.2-B: Approved Pole Types by Location

Part Information	Part Description	Highway and Freeway [1]	Arterial and Large Collector	Collector and Local Street	Existing Res. Local Street	Historic District [2]	New Res. Local Street [3]
POLE TYPE – WOOD DISTRIBUTION							
N/A	Wood pole. Various heights, but standard id 35 feet. DME warehouse item. Direct buried. Overhead electric service.	Yes	Yes	Yes	Yes	No	No
Arm - Shakespeare #OPAR-8-H	8-ft. curved aluminum arm.	-	-	-	-	-	-
POLE TYPE – WHITE CONCRETE							
Lonestar #351101	35-ft. Concrete pole, white color. Single or double arm available. DME warehouse item. Direct buried. Underground electric service.	Yes	Yes	Yes	Yes	No	No
Arm - Curlee #2009032TG-Flat Base	8-ft. flat aluminum arm.	-	-	-	-	-	-
POLE TYPE – CONCRETE AGGREGATE							
Lonestar #20004-SJB (Waterford Series)	20-ft. Concrete aggregate pole. Post-top luminaire configuration. Direct buried. Underground electric service. Legacy – replacement and maintenance only	No	No	No	Yes	No	No
POLE TYPE – ANTIQUE ALUMINUM							
Acuity #PX-CP18-12-F4-AB3/133T3-ANBK	12-ft. antique, decorative aluminum pole. Post-top luminaire configuration. Requires concrete foundation. Underground service.	No	No	Yes[2]	Yes[2]	Yes[2]	No
POLE TYPE – EMBEDDED STEEL							
(Single Arm) KW Industries RTSU35-9.0-11-RAL7043-18S-GS-E	35-foot round steel pole, gray color (RAL7043). Single arm, direct buried pole. Underground electric service. Arm included with pole. Pairs with Gardco Optiform M luminaire.	Yes	Yes	Yes	No	No	No
(Double Arm) KW Industries RTSU35-9.0-11-RAL7043-28S-GS-E	For use in medians. 35-foot round steel pole, gray color (RAL7043). Double arm, direct buried pole. Underground electric service. Arm included with pole. Pairs with Gardco Optiform M luminaire.	Yes	Yes	No	No	No	No

Part Information	Part Description	Highway and Freeway [1]	Arterial and Large Collector	Collector and Local Street	Existing Res. Local Street	Historic District [2]	New Res. Local Street [3]
POLE TYPE – BREAK-AWAY STEEL[4]							
(Single Arm) KW Industries RTSU35-9.0-11-RAL7043-18S-GS-BSC-1.00-SKT Foundation 30" x 96" Concrete	35-foot round steel pole, gray color (RAL7043). Single arm, breakaway base mounted on a poured concrete foundation. Underground electric service. Arm included with pole. Pairs with Gardco Optiform M luminaire. Contact DME for poured concrete foundation standards.	Yes[4]	Yes[4]	No	No	No	No
Double Arm (Single Arm) KW Industries RTSU35-9.0-11-RAL7043-28S-GS-BSC-1.00-SKT Foundation 30" x 96" Concrete	For use in medians. 35-foot round steel pole, gray color (RAL7043). Double arm, breakaway base mounted on a poured concrete foundation. Underground electric service. Arm included with pole. Pairs with Gardco Optiform M luminaire. Contact DME for poured concrete foundation standards.	Yes[4]	Yes[4]	No	No	No	No
POLE TYPE – BRIDGE-MOUNT STEEL STEEL[5]							
(Single Arm) KW Industries RTSU35-9.0-11-RAL7043-28S-GS-ATB1-17 Foundation TXDOT Bridge	For use in medians. 35-foot round steel pole, gray color (RAL7043). Double arm, breakaway base mounted on a concrete bridge foundation. Underground electric service. Arm included with pole. Pairs with Gardco Optiform M luminaire.	Yes	Yes	No	No	No	No
POLE TYPE – STEEL RESIDENTIAL							
KW Ind., Part# SSP20-4-11-DGY GARDCO-DM10-BC Foundation 24" x 72" Concrete	20-ft., dark gray (RAL7043), 4-in. square steel pole. Drilled for single-luminaire with standard mounting pattern. Underground service. Pairs with Gardco Optiform S luminaire. Contact DME for poured concrete foundation standards.	No	No	No	No	No	Yes

Notes:
[1] Unless, otherwise specified by TxDOT.
[2] Historic streetlighting is only available for use in designated historic districts.
[3] Speed limits of 30 mph or less.
[4] Steel streetlight poles are only used for highways and roadways where TxDOT or City-approved plans require placement of break-away bases or non-standard mounting heights.

D. Historic Lighting

Historic lighting is a modern light fixture with a decorative pole and fixture that give the lighting the look of early 20th century lighting. Historic lighting has been approved for use only in the *designated historic* districts of Denton. All requests for historic lighting within these districts must be submitted to DME Engineering for design and approval. Historic lighting is not approved for installations outside of the historic districts. The requesting organization, developer, or agency shall be responsible for all costs related to the design and installation of historic streetlights.

E. Control System

All new streetlighting in the DME service area shall have a control node installed which, at a minimum, will turn the light on and off according to ambient light conditions (photocell control) and shall be compatible with the CityTouch lighting control system. *See* Table 7.2-C shown below. Where street lighting is installed by the developer, DME shall provide and install control nodes at the developer's expense. DME will commission the control nodes into the CityTouch program.

Where streetlighting is served by other electric utilities than DME, DME does not require or install control nodes.

Table 7.2-C: CityTouch-compatible control node models

Model Number	Voltage (V)	Use	Function
LLC7290	120 – 277	Cobra head lights	Photocell controller
LLC7294	347 – 480	High-voltage cobra head lights	Photocell controller
LLC7291	120 - 277	Post-top lights	Astro-clock (GPS location-based timers)

F. Dimming and Light Trespass

The City adheres to ANSI RP-8 lighting levels for all streets *except* local residential streets with speed limits of 30 mph or less. Lighting that has been designed to ANSI RP-8 cannot be dimmed without diminishing the lighting level which, by definition, no longer meets the RP-8 standard. Thus, all streetlighting that is not in residential neighborhoods with speed limits of 30 mph or less will be maintained at full brightness.

On local residential streets with speed limits of 30 mph or less, the streetlights may be dimmed by resident request at specific locations due to light pollution concerns by residents. DME will dim residential streetlights down as low as 60%.

The City also reserves the right to install house side shields (available only on cobrahead lights) and make other reasonable modifications to the luminaires to minimize impacts to the residents at the DME's discretion.

G. Migratory Birds and Other Flying Species

DME will dim residential streetlights down as low as 50% during select animal migration or activity periods as specified by the City Environmental Services & Sustainability Department.

H. International Dark Sky Association

DME installs and maintains two types of streetlight luminaires (light fixtures), post-top and cobrahead. The cobrahead light fixtures are endorsed by the International Dark Sky Associate (IDA) which makes recommendations on lighting with minimal up-light. The existing post-top lighting fixtures are not IDA endorsed, however an acceptable IDA approved alternate is being considered for all residential streets with speeds less than 30 mph.

7.2.4 Construction Requirements

Streetlight construction (e.g. conduit, wiring, etc.) shall follow the DME Standard Construction Drawings, stated below:

A. DSL-ARM
B. DSL-STD
C. DSL-12A
D. DSL-20C (Legacy)
E. DSL-35C
F. DSL-20S
G. DSL-35SE
H. DSL-35SE2
I. DSL-35SBK
J. DSL-35SBK2
K. DSL-35SBD

Conduit runs should not exceed 700 feet between pulling locations. When bends total 180 degrees conduit runs should be limited to 500 feet or less. No run of conduit should have more than 360 degrees of total bend between pulling points.

The total length of a single lighting circuit at 120V should be less than 1,000 feet, the total length of a single lighting circuit at 240V should be less than 2,000 feet, and the total length of a circuit at 480V should be less than 4,000 feet unless circuit design and loading has been validated by engineering.

Additional design information may be found in the *TxDOT Highway Illumination Manual*.

7.3 Developer and DME Responsibilities

7.3.1 Highways and Streets (except local residential streets with speed ≤ 30 mph)

Developer is responsible for streetlighting design that meets the requirements of ANSI RP-8 for the appropriate roadway characteristics. A photometric (lighting) study shall be required. The final design must be approved and stamped by a Texas licensed professional engineer. Final design must also be approved by DME Engineering.

Lighting levels, placement, and compliance with ANSI RP-8 must be verified and documented with lighting design software. At a minimum, documentation shall be provided to DME Engineering showing:

A. Street geometry (width, number of lanes, median size)

B. Street classifications (arterial, collector, etc.)

C. Pedestrian activity classification

D. Criteria levels applied (illuminance vs. luminance method, and levels)

E. Lighting placements (median, side, parallel, staggered)

F. Maximum separation distance*

As an alternative to displaying the maximum separation distance as stated in 7.3.1.F above, a layout drawing of the project may be provided with calculation grid values and/or light level isolines indicating that the installation meets the applicable requirements.

For TxDOT projects, the design contractor will provide specific lighting requirements, if any. The design package should dictate where lighting should be placed and what types of poles and fixtures should be used.

For City initiated projects, the City's Engineer or their contractor will design the street lighting and submit to DME Engineering for approval. Once approved, the city's contractor will perform all civil work, and pull wiring and install streetlights and poles. DME will provide service points as needed. DME will also install and commission control nodes for interconnection with CityTouch.

A monthly maintenance, repair, and usage fee will be charged to the City thereafter for all streetlights on public streets per current DME rates.

7.3.2 Local Residential Streets (with speed limits ≤ 30mph)

The Developer (or DME if DME is responsible for the given project) is responsible for the design and layout of streetlights at all intersections, cul-de-sacs, and no more than 250 feet between. DME Engineering shall approve the final design. Once the project is approved and permitted, the Developer is responsible for providing all civil work including grading, trenching, installation of conduit and pull-boxes, etc.

DME is responsible for installation of wire, streetlights and poles, and service points. DME will charge an initial installation cost to the developer based on the number of lights.

A monthly maintenance, repair, and usage fee will be charged to The City thereafter for all streetlights on public streets per current DME rates.

For City initiated projects, the City's Engineer or their contractor will design the street lighting and submit to DME for approval. Once approved, the city's contractor will perform all civil work, and pull wiring and install streetlights and poles. DME will provide service points as needed. DME will also install and commission control nodes for interconnection with CityTouch.

For private streets and drives (where the City of Denton does not take ownership of the roadway or streetlights), one of the following will occur:

A. If non-standard lights are installed, DME will provide a metered service point. Developer is responsible for installation of entire streetlighting system. Designated customer (individual, HOA, etc.) will be responsible for monthly power costs and all maintenance. **OR**

B. If standard DME lighting is installed, Developer is responsible for all civil work (grading, trenching, installation of conduit, etc.) and installation of poles and streetlights. DME will pull wires and connect the lights at the Developer's expense. Designated customer (individual, HOA, etc.) will be responsible the monthly streetlight power and maintenance rates. **OR**

C. Exceptions to this rule must be agreed upon by all parties in a formal agreement.

7.3.3 Streetlighting in Non-DME-Served Areas

Standard streetlights have been approved by the City as listed in the General Requirements section of this manual. Electric utilities other than DME may or may not be able to provide the same luminaires. Non-standard lights will not be maintained by DME or the City. DME will provide, install, maintain, and repair standard the City streetlights at the Developer's expense. The electric service provider will charge the City according to the rates agreed upon between the City and the electric service provider.

For streets in non-DME service territories, Developer should coordinate with the electric utility, DME, and the City at the earliest stage of development to determine and agree upon the following:

A. Developer, City/DME, and Customer responsibilities

B. Service points and project design

C. Mode of disconnect for safe maintenance (e.g. in-line fuses, etc.)

D. Mode of billing (metered usage, monthly rate, etc.)

E. Designated customer/developer responsible for fees

F. Other concerns as applicable

7.3.4 Customer/Citizen Requests for addition/removal of Streetlighting

Streetlights managed by DME are funded through the City's Capital Improvement Projects (CIP) process. As concerns are identified and provided to DME via citizen comments, staff input, and/or City Council direction the requests are directed to DME Engineering for technical evaluation. The technical evaluation is to determine if the modifications would provide added safety and visibility according to national and local standards and ordinances. Light pollution/intrusion, cost, feasibility, and aesthetic value are also considered. At the conclusion of the technical evaluation, DME Engineering submits a recommendation for or against inclusion of the project in the CIP.

DME will maintain the list of all requested modifications and prioritize those that have been recommended for inclusion within the upcoming CIP. Some or all of the highest priority projects will be programmed into the upcoming budget based on availability of funds.

Requests for dimming will be considered in residential areas, and in coordination with the City's Environmental Services & Sustainability Department, DME may dim streetlights in residential developments to no lower than 50% brightness. Cobrahead streetlights along other local, collector, and arterial streets may not be dimmed due to safety and regulatory requirements.

Section 8: Environmentally Sensitive Areas Design Criteria

8.1 Overview

The purpose of Section 8 - Environmentally Sensitive Areas (ESAs) Design Criteria is to provide the technical design criteria needed to achieve compliance with DDC Subchapter 7, Section 7.4. The goal is to provide basic guidance for implementing certain components of ESA plans, such as ESA Field Assessments. While the intent of this section is to assist applicants and developers with ESA requirements, full responsibility and liability for proper design and compliance with DDC § 7.4 remains with the developer or applicant. Users of this Manual should be knowledgeable and experienced in environmental surveys, inventorying and restoration (see the basic requirements for a qualified person in this section).

This section does not provide complete guidance for Alternative ESA Plans, as those plans are developed through a variance procedure, due to special circumstances or conditions that apply to the parcel for which the variance is sought. The Alternative ESA Plan procedure is described in DDC § 2.8.4.

The following documents govern the design criteria in this section:

A. The Denton Development Code
B. Floodplain Development Checklist
C. ESA Field Assessment Checklist
D. Alternative Environmentally Sensitive Area Checklist
E. The iSWM Landscape Technical Manual
F. The National Wetland Plant List

8.2 ESA Identification

8.2.1 The Official ESA Map

A. To locate potential ESAs, the applicant shall use the City of Denton's Official ESA Map.
B. The legend in the Official ESA Map displays the types of ESAs and their designations.
    1. The City recognizes four types of ESAs
        a. Cross Timbers Upland Habitat
        b. Water Related Habitat
        c. Riparian Buffer ESA
        d. Floodplain ESA
    2. ESAs can have one of two designations
        a. Designation Confirmed
            i. ESA assessments expire after 24 months; the applicant shall check the date that the assessment was approved to ensure that the current designation is correct
        b. Not Assessed or Assessment Expired

C. Areas determined to be ESAs during field assessments are added to the Official ESA Map.

D. Areas determined not to be ESAs during field assessments may potentially be removed from the Official ESA Map.

E. Because ESA criteria applies to all land and development, it may be necessary to perform ESA Field Assessments in areas not identified on the Official ESA Map. This could be due to site conditions or current aerial photography (among other reasons).

8.3 ESA Field Assessments

8.3.1 ESA Field Assessor

ESA features shall be identified during the ESA Field Assessment by a qualified person. Minimum requirements to be considered a qualified person are:

A. Have a bachelor's degree in ecology or similar field of study; or

B. Be a certified/trained wetland scientist; or

C. Have similar qualifications in plant identification, soil classification, and hydrology.

1. The City accepts professional licenses and certifications such as Professional Wetland Scientist (PWS), Wetland Professional in Training (WPIT), and continuing professional education courses from applicable programs.

8.3.2 ESA Forms

All ESA submittals shall utilize the City's Assessment Forms:

A. Cross Timbers Upland Habitat Assessment Form

B. Floodplain ESA Assessment Form

C. Riparian Buffer ESA Assessment Form

D. Water-Related Habitat Assessment Form

8.3.3 ESA Field

ESA Field Assessments shall contain, at a minimum:

A. Assessor qualifications

B. Comprehensive reports appropriate for each ESA type and feature assessed

C. A project narrative with details of the assessment, including, but not limited to:

1. A brief description of the project's nature
2. Descriptions and locations for ESAs identified on the Official ESA Map
3. Descriptions and locations of any ESAs determined to be present
    a. Include detailed reasoning as to why ESA features were identified
    b. Include colored photographs as supporting evidence
4. Description and location of any ESAs determined to be absent

a. Include detailed reasoning as to why ESA features were not identified

b. Include colored photographs as supporting evidence

D. Shapefiles identifying both confirmed ESAs, and ESA locations that should be removed. The following geographic information shall be used:

1. Geographic Coordinate System: GCS North American 1983

2. Datum: D North American 1983

3. Prime Meridian: Greenwich

4. Projected Coordinate System: NAD 1983 State Plane Texas North Central FIPS 4202 Feet

5. Projection: Lambert Conformal Conic

E. A site map or series of maps, that delineate the boundaries and types of ESAs as indicated on the Official City of Denton ESA Map

F. A site map that delineates the boundaries and types of ESAs that were assessed; this may differ from the Official ESA Map

1. Indicate the reach of each assessment and locations of photographs taken on a map; this may be its own map

8.4 ESA Preservation Requirements

Where ESAs are identified, whether through field assessments or an existing, confirmed designation, ESA protection must be installed.

A. ESA protection shall consist of protective fencing established at the perimeter of any ESAs. Where a protected tree is located near the ESA perimeter, protective fencing shall be installed at the dripline of the tree.

B. Land-clearing to allow for the installation of ESA protection fencing shall occur upslope of the ESA perimeter (that is, on the outside perimeter), and shall not exceed a width of four feet. It shall not encroach into the dripline or critical root zone of any tree to be protected.

C. Protective fencing should be a minimum of four (4) feet in height and consist of plastic safety fencing or other approved fencing material. Protective fencing shall be supported by posts not exceeding 20 feet spacing.

D. Protective fencing shall be placed downslope of any perimeter controls for erosion and sedimentation.

8.4.1 ESA Inspections

A. Initial Inspections

1. An initial inspection must be conducted prior to commencing land-disturbing activities for the approval of permits or issuance of a Notice-to-Proceed.

2. ESA protective fencing shall be inspected against corresponding site plans for proper placement and installation.

B. Routine Inspections

1. ESA inspections shall be conducted after land-disturbing activities have commenced to

ensure compliance with ESA criteria, and may be conducted during all phases of development, including:

a. cut and fill
b. demolition
c. clearing and grading
d. grubbing
e. stockpiling
f. installation of utility infrastructure
g. construction
h. vertical building

2. Routine inspection items shall include:
   a. Maintenance, repair and replacement of ESA protective fencing; damaged ESA fencing shall be repaired or removed and replaced during all phases of development until final inspection.
3. During development, access to the ESA shall be prohibited; the ESA shall be preserved in its original state.
4. The disposal of any waste material into the ESA is prohibited.
5. Siltation/sedimentation to the ESA is prohibited; any that occurs shall be addressed in a timely manner.
   a. Siltation/sedimentation impacting up to 0.10 acres of any ESA must be removed by hand or equivalent method, as approved by the City.
   b. Siltation/sedimentation impacting 0.10 acres or more of any ESA must be addressed through an Alternative ESA Plan.
6. The permanent loss of any native vegetation is prohibited.
   a. Native vegetation loss impacting up to 0.10 acres of any ESA or the loss of up to two (2) trees, shall be replaced in-kind.
   b. Native vegetation loss impacting 0.10 acres or more of any ESA, or the loss of three (3) trees or more, must be addressed through an Alternative ESA Plan.

8.5 Restoration Plans for Permitted Uses and Activities

8.5.1 Restoration Plan Requirements

Permitted uses and activities for each ESA are described in DDC §§ 7.4.6-7.4.8. For permitted uses and activities, the applicant shall provide a restoration plan which, at a minimum, includes:

A. Locations and descriptions of any areas within the ESA that will require restoration.
B. Locations and descriptions of temporary stabilization measures.
C. Descriptions of restoration activities, including but not limited to:
   1. Erosion minimization

2. Native plant restoration
3. Invasive vegetation removal

D. Schedule/timeline for restoration activities

E. Descriptions and locations of permanent seed mixes and/or plantings.

8.5.2 Restoration Activities

A. This subsection applies to approved Restoration Plans and, and mitigation for Alternative ESA Plans.

B. Restoration and/or mitigation shall be initiated immediately whenever development activities have permanently or temporarily ceased within the ESA.

1. Development activities have permanently ceased when land-disturbing activities within the ESA have been completed.
2. In the context of this provision, "immediately" means as soon as practicable, but no later than the end of the next workday, following the day when development activities have temporarily or permanently ceased.

C. Restoration and/or mitigation shall be completed prior to close-out or issuance of final Certificate of Occupancy.

8.5.3 Alternative ESAs

For Alternative ESA plans, mitigation must be initiated as ESAs are disturbed and to the same extent, unless alternatively specified in the approved Plan.

Section 9: Design Deviations

9.1 Overview

9.1.1 General

All developments within the City and its extraterrestrial jurisdictions shall conform to the design criteria established in this DCM. In the event that a development cannot comply with the design criteria established, a design deviation process is used to evaluate, document, and approve proposed alternative methods.

Any deviation from the required design criteria for design of facilities outlined in this DCM must be submitted as a design deviation request to the City's Engineer and Department Reviewer, prior to incorporating it into the final design of a project.

9.2 Design Deviation Procedure

9.2.1 Request for Design Deviation Submittal and Processing

A. All design deviation requests must be submitted as a formal request to Development Project Facilitation using the 'Request for Design Deviation Form' included in Appendix B, along with supporting documentation.

1. The 'Request for Design Deviation Form' shall be filled out completely with exception of the portions noted as "For Use by City".
2. Supporting documentation shall include:
    a. All pertinent information on the facilities involved or to be involved. The specific portion of this DCM, policies, or design standard(s) for which a design deviation is sought;
    b. Description(s) of all other design alternatives which the applicant has evaluated in attempts to comply with the design criteria prior to the request for design deviation; and
    c. A statement that provides justification for the requested design deviation and how it is the necessary and optimal solution when compared with reasonable alternatives for the scenario presented.
3. Design deviation requests that do not contain the required Request for Design Deviation Form and supporting documentation are incomplete and will not be reviewed.

B. The request and supporting documentation shall be submitted concurrently with Civil Engineering Plans, Zoning Compliance Plans, Planned Development, or Specific Use Permit submittal.

9.2.2 Criteria for Granting of Design Deviation

A. The review of a design deviation request by the City's Engineer and Department Reviewer shall assess whether the request:

1. Clearly demonstrates an exceptional hardship which prevents the design criteria from being met. This hardship cannot be solely self-imposed and should be based upon physical characteristics of the property, environmental conditions, or existing conditions created by surrounding development;

2. Is not detrimental to the public welfare;
3. Does not adversely impact the operations of the system or the public facility in question;
4. Is supported by a signed and sealed engineering analysis performed by a Licensed Professional Engineer in the State of Texas, if requested by the Engineering Department; and
5. Shall not be solely to mitigate a financial hardship.

B. The decision of the City's Engineer and Department Reviewer is guided by the criteria for approval, but is ultimately discretionary based on their engineering judgment and professional experience.

C. All approved design deviation requests shall be signed by the City's Engineer and Department Reviewer, before implementation.

D. The decision of the City's Engineer and Department Reviewer to grant a design deviation shall not relieve the applicant's Engineer of the professional obligation and responsibility to ensure any approved alternatives to the use of the material, design, or method of construction are fit for the intended purposes of the facilities at issue.

E. If a design deviation request is denied by the City's Engineer and Department Reviewer, the applicant may consider reviewing alternatives and resubmitting the application with more information as is deemed necessary, for re-evaluation by the City's Engineer and Department Reviewer.

9.3 Revocation of an Approved Design Deviation

9.3.1 Applicability and Procedure

A. An approved design deviation request may be revoked by the City's Engineer and Department Reviewer, if:
1. The supporting documentation that the City's Engineer and Department Reviewer used to review and approve the design deviation request is materially altered or updated. Any individual or entity that receives an approved design deviation request must provide the City's Engineer and Department Reviewer with any change in plans or conditions to the project that affect the requested deviation as soon as practicable after any such change occurs. Failure to provide these updates may result in design deviation revocation by the City.
2. The applicant is shown to have provided inaccurate or incomplete information during review of the design deviation request.
3. The City determines there is a failure to comply with any term, condition, or requirement applicable to a design deviation;

B. A decision to revoke a design deviation is effective immediately. Notice of the decision shall be communicated to the applicant.

Appendix A: Example Stormwater Facility Checklists

INSPECTION CHECKLIST FOR SIMPLE DETENTION BASIN

Facility Name: _____ **Facility Agreement Number:** _____

Basin/Pond Number: _____ **Inspected By:** _____ **Date:** _____

Type of Inspection: Annual _____, Quarterly _____, Monthly _____, Routine _____, or Storm Event _____, (# days since event _____)

Basin Conditions:

1. Is there standing water or wet spots? Yes____No _____Comments _____
2. Does sides or bottom show signs of erosion, settling, cracking, etc? Yes____No _____Comments _____
3. Does dam or emergency spillway show signs of erosion, settling, cracking, or other problems Yes____No _____Comments _____
4. Is there evidence of animal burrowing in dam? Yes____No _____Comments _____
5. Is there evidence of changes in shape or volume of basin? Yes____No _____Comments _____
6. Do vegetated areas need mowing? Yes____No _____Comments _____
7. Are there trees or woody growth in dam? Yes____No _____Comments _____
8. Are there areas that need to be re-vegetated? Yes____No _____Comments _____
9. Is there any accumulation of silt, trash, debris or litter in the basin? Yes____No _____Comments _____
10. Are there any other basin maintenance activities needed? Yes____No _____Comments _____

Structural Components:

1. Are pipes, channels, trash racks, etc. free of obstructions? Yes____No _____Comments _____
2. Are pipes, spillway or trash racks in need of repair? Yes____No _____Comments _____
3. Is the low flow or trickle channel in need of repair? Yes____No _____Comments _____
4. Is the outfall channel in need of repair? Yes____No _____Comments _____
5. Are there any other structural maintenance activities needed? Yes____No _____Comments _____

Plan for correcting deficiencies:

_____

_____

_____

_____

Signature:

_____

Owner's Representative

Date:

_____

ENGINEER'S CHECKLIST FOR STORMWATER
FACILITY MAINTENANCE AGREEMENT

Please attach additional sheets as necessary for comments and descriptions. Fit all sheets to 8½" x 11".

ORGANIZATION INFORMATION	
1. Company (Applicant)	**Address:**
2. Contact's Information: Contact Name Mailing Address Telephone Number(s) Email	**3. Execution Information:** Signatory's Name Mailing Address Telephone Number(s) Email

4. Property Location:
(Note: If the property has not been addressed, please enter the legal description)

5. Associated Plat Numbers:
(Note: if request is related to multiple plat applications, please list each individually)

6. Associated Building Permit Numbers:
(Note: if request is related to multiple permits, please list each individually)

AGREEMENT & ATTACHMENT INSTRUCTIONS

If the property owner is a **corporation**, the agreement must be signed by a person who is duly authorized to bind the corporation including, but not limited to, a President or Vice President. . If a **partnership**, the agreement must be signed by the managing partner. If the applicant is a **sole proprietor**, he/she signs the agreement on behalf of him or herself. Additionally, for corporations and partnerships, a copy of the *Articles of Incorporation*, showing signature authority for whoever signs the agreement must also be submitted (Note: Applicants may also submit a board resolution or power of attorney authorizing an agent or assign to sign on behalf of the property owner. The agreement must be completely filled out and three copies submitted to the Planning and Development Department. Signatures on all three agreement drafts must be original and notarized. Lastly, please submit a copy of the deed for the noted property.

NOTE: Agreement and all attachments should be submitted on 8 ½" x 11".

	Yes	No	N/A	Comments/Descriptions
1. Legal Agreement – Standard agreement form provided by the City.	___	___	___	_____
2. Exhibit "A" - Legal Description (Attached)				
A. Metes and Bounds.	___	___	___	_____
B. Surveyor's Drawing, with seal affixed and marked as "Drainage Easement".	___	___	___	_____
C. Preliminary Plat.	___	___	___	_____
3. Exhibit "B" - Design Plan and Specifications (Attached)				
A. Design Calculations – in accordance with iSWM.	___	___	___	_____
B. Schematic Plan (See Example Detention Plan Schematic)- prepared in accordance with approved construction plans:	___	___	___	_____
• Plan View showing critical structural elements .	___	___	___	_____
• Critical structural elements are clearly labeled in layman terms.	___	___	___	_____
• Profile including a longitudinal section showing all critical structural elements with elevations.	___	___	___	_____
• Cross-sections as needed to show size and general grading. **NOTE: All Schematics should be submitted on 8 ½" x 11".**	___	___	___	_____
C. Landscaping shown per approved Landscape Plans.	___	___	___	_____
4. Exhibit "C" - Operations and Maintenance Plan (Attached)				
A. Routine Maintenance Specifications:				
1. Mowing as needed to control weeds and woody plants.	___	___	___	_____
2. Trash removal from critical structural elements.	___	___	___	_____
3. Additional maintenance.	___	___	___	_____
B. Non-routine Maintenance Activities:				
1. Bank repair and stabilization.	___	___	___	_____
2. Re-vegetation - required when 30% or more of area is unprotected.	___	___	___	_____

	Yes	No	N/A	Comments/Descriptions
3. Sediment removal from the detention/retention facility when:	___	___	___	_____
• Detention basin – when water depth is reduced 25% or more, or basin does not drain within 72 hours.	___	___	___	_____
• Retention pond – when water depth is 4' or less.	___	___	___	_____
• Sediment traps/forebay – when depth is reduced by 50% or more.	___	___	___	_____
4. Structural repair/replacement for all damaged or deteriorated structures, trickle channel, trash rack, etc.	___	___	___	_____
5. Mechanical equipment repairs.	___	___	___	_____
6. Other maintenance Activities.	___	___	___	_____

5. Exhibit "D" - Maintenance Checklist *

A. Covers ordinary needs, in layman terms.	___	___	___	_____
B. Structural components labeled consistent with Schematic Plan.	___	___	___	_____

*See attached Inspection Checklist for Detention Basin

NOTE: All Exhibits should be submitted on 8 ½" x 11".

(seal)	I certify that this Stormwater Facility Maintenance Agreement, checklist, required attachments, and additional comments, was prepared under my responsible supervision and that the information presented on this checklist and attachments is correct to the best of my knowledge. I also understand that an acceptance of this plan by the City does not waive any City standards or requirements unless a specific waiver request has been submitted and approved. Signed_____ Date_____ Print Name:_____

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Appendix B: Design Deviation Request Form

Development Services
401 N. Elm Street, Denton, TX 76201 (940) 349-8541

City of Denton Design Deviation Request Form

Submitted by:_____Phone:_____Email:_____
Company:_____Date:_____

Project Information
City of Denton Project Number:_____Project:_____
Type of Development:_____
Location:_____ (include map)

Design Deviation Request (Each deviation from criteria requires a separate submittal and will be evaluated independently.)
Specify section of the DCM/DDC/design standard(s) for which a deviation is sought:

Please explain how the project is unable to meet the design criteria.
(This hardship cannot be solely self-imposed and should be based upon physical characteristics of the property, environmental condition, or existing conditions created by surrounding development.)

What other design alternatives have been evaluated to comply with the design criteria, prior to the request for design deviation:

Detailed explanation of requested design deviation:

The deviation request will be evaluated based on the criteria set forth in DCM 8.2.2.

☐ By submitting the design deviation request, the applicant hereby acknowledges and understands the design deviation procedure. (Please check.)

CITY OF DENTON
Development Services
401 N. Elm Street, Denton, TX 76201 (940) 349-8541

Supporting Documentation

List and provide attachments supporting the design deviation as stated in the DCM Section 8.2.1.
(drawings, calculations, topographic information, photographs, maps, or other pertinent information)

FOR USE BY THE CITY OF DENTON

Justification of Decision:

Deviation Decision: ☐ Accepted ☐ Denied

Reviewing Department: ☐ Solid Waste ☐ Stormwater ☐ Transportation ☐ Water/Wastewater ☐ Street Light

Department Reviewer:_____ City's Engineer:_____

Date:_____ Date:_____

Signature:_____ Signature:_____

(The deviation request decision must be signed by both the Department Reviewer and the City's Engineer.)

2 of 2

Note: Request the fillable Deviation Request form from your Facilitator.

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Appendix C: Poles and Luminaires - Standard Lighting Fixtures

Figure C.1: Residential Lighting – 20-ft. concrete aggregate pole woth post-top luminaire

Figure C.2: General Street Lighting – Wood (distribution) pole with single-mast arm and cobra head luminaire

Figure C.3: General Street Lighting – 35-ft. white concrete pole with single or double-mast arms and cobra head luminaire

Figure C.4: Historic District Lighting – 12-ft. concrete aggregate pole woth post-top luminaire

Figure C.5: Alternate General Streetlighting – 35-ft. dark gray steel pole with single or double mast arms and new cobra head luminaire.

Appendix D: Types of Environmentally Sensitive Areas

The City of Denton has identified four distinct ESAs - Floodplains, Riparian Buffers, Water-Related Habitat, and Cross Timbers Upland Habitat. Native plants associated with each ESA are listed below. A complete list of Native Plants is included in Appendix E.

A. Floodplain ESAs exist on the terraced banks surrounding waterways where the land is subject to flooding. The City of Denton uses the most current FEMA Flood Insurance Rate Map (FIRM) to define boundaries of protected Floodplain ESAs. Areas designated as 1% Annual Chance Floodplain, labeled on the FIRM as Zone A or Zone AE, would be classified according to existing conditions as developed or undeveloped floodplains. Areas identified as undeveloped floodplains become protected Floodplain ESAs. Floodplain ESA habitat is often an extension of the more sensitive Riparian Buffer. Typical Floodplain ESA habitat is dominated by tree species that can tolerate intermittent flood events.

B. Riparian Buffer ESAs are adjacent to bodies of water such as wetlands, streams, rivers, ponds and lakes. A healthy functioning Riparian Buffer will have a mix of woody and herbaceous plants. Streams, creeks, and rivers are classified by their duration of flow; there are three types:

   1. Perennials flow continuously except during severe drought.
   2. Intermittent flow only for a portion of the year seasonally or after rainfall.
   3. Ephemerals only flow in direct response to rainfall and will often be dry.

C. Water-Related Habitat ESAs are split into four categories: wetlands, bottomland hardwood forests, springs, and deepwater habitats. These areas are typically found in low-lying areas near bodies of water but can also be isolated low-lying areas that meet characteristics of water-related habitats. These characteristics will likely include hydric soils, signs of hydrology, and hydrophytic vegetation.

   1. Wetlands can be isolated or adjacent and will have all three wetland indicators present: hydric soils, hydrology, and hydrophytic vegetation. Adjacent wetlands are connected to a jurisdictional water body, such as a lake or river, and are subject to federal regulation under the Clean Water Act; isolated wetlands are not connected to surface water bodies and are regulated at the state or city level.

      a. An area shall be classified as a wetland if it meets the Army Corps of Engineers three parameter technical criteria as outlined in the Corps of Engineers 1987 Wetlands Delineation Manual (Section D. Routine Determinations).

      b. The recommended routine method assumes sufficient hydrology and hydric soils if the area in question has over 50% vegetative cover of hydrophytic (facultative-wet and/or obligate as listed in the National Wetland Plant List (NWPL), Great Plains Region, and a clearly defined boundary between the hydrophytic and upland plant communities.

      c. Permitted water quality ponds, roadside ditches, and ponds fed by wells or other sources of artificial hydrology are not considered wetlands.

      d. The Wetlands Classification System (WCS) includes five major Systems: Marine, Estuarine, Riverine, Lacustrine, and Palustrine. The first four include both wetlands and deepwater habitats, but the Palustrine only includes wetland habitats. In North Central

Texas, the predominant wetland types are Riverine, Lacustrine and Palustrine, and are detailed in Table 9-A below.

Table D-1: Predominant Wetland Types of North Central Texas	
Wetland Type	**Major Characteristics**
Riverine	Wetlands and deepwater habitats within a stream or river channel; includes oxbow lakes and sloughs; periodically influenced by flooding
Lacustrine	Wetlands and deepwater habitats associated with large lakes and reservoirs; situated in basins that lack significant tree or shrub cover
Palustrine	All non-tidal wetlands dominated by trees, shrubs, or persistent plants; includes Bottomland hardwood forests, which is the most widespread type of wetland in Texas and includes trees like pecan, sugarberry, and black willow.

2. Bottomland Hardwood Forest ESAs consist of deciduous forested wetlands and river bottoms. Denton defines this habitat as areas containing at least 50 percent of native trees and understory vegetation typically found in a bottomland hardwood forest.

3. Springs are points of natural groundwater discharge that produce flow, a pool of water, or maintain hydrophytic plant communities (refer to Facultative-wet or Obligate plant species as listed in the in the National Wetland Plant List (NWPL), Great Plains Region. Physical indicators include pooling of water, hydrophytic plants, or the presence of a water temperate gradient in a creek or pool.

4. Deepwater habitats are permanently flooded lands lying below the deepwater boundaries of wetlands. Deepwater habitats include environments where surface water is permanent and often deep, so that water, rather than air, is the principal medium within which the dominant organisms live, whether or not they are rooted in, or attached to, the substrate. As in wetlands, the dominant plants are hydrophytic.

Wetlands and deepwater habitats are defined separately because traditionally the term wetlands has not included deep, permanent water; however, both must be considered an ecological approach to classification. The boundary between wetland and deepwater habitats in the riverine and lacustrine systems lies at a depth of 2 meters (6.6 feet) below water; however, if emergent, shrubs or trees grow beyond this depth, their deep-water edge is the boundary.

D. Cross Timber Upland Habitat ESA are deciduous forest interspersed with prairie grasses. It can be split into four vegetative sub-regions. The predominate sub-region found in Denton, TX is the Eastern Cross Timbers. The Eastern Cross Timbers is dominated by Post Oaks and Blackjack Oaks.

Appendix E: Native Plants for ESAs

Table E-1: Native Plants List – Canopy Trees	
Common Name	**Botanical Name**
Red maple	*Acer rubrum*
Texas buckeye	*Aesculus arguta*
Pecan	*Carya illinoiensis*
Texas hickory (Black hickory)	*Carya texana*
Net-leaf hackberry	*Celtis reticulata*
Desert willow	*Chilopsis linearis*
White ash	*Fraxinus americana*
Green ash	*Fraxinus pennsylvanica*
Texas ash	*Fraxinus texensis*
Black walnut	*Juglans nigra*
Ashe juniper (Mountain cedar)	*Juniperus ashei*
Eastern red cedar	*Juniperus virginiana*
Sweetgum	*Liquidambar styraciflua*
Texas red oak	*Quercus buckleyi*
Escarpment live oak	*Quercus fusiformis*
Bur oak	*Quercus macrocarpa*
Blackjack oak	*Quercus marilandica*
Chinquapin oak	*Quercus muehlenbergii*
Shumard oak (Red oak)	*Quercus shumardii*
Bigelow oak	*Quercus sinuata var. breviloba*
Post oak	*Quercus stellata*
Live oak	*Quercus virginiana*
Black willow	*Salix nigra*
Western soapberry	*Sapindus saponaria var.drummondii*
Chittamwood (Gum bumelia)	*Sideroxylon lanuginosum*
Winged elm	*Ulmus alata*
American elm	*Ulmus americana*
Cedar elm	*Ulmus crassifolia*
Slippery elm	*Ulmus rubra*
Prickly ash (Texas hercules club)	*Zanthoxylum hirsutum*

Table E-2: Native Plants List – Small Trees and Shrubs	
Common Name	**Botanical Name**
White buckeye (Texas buckeye)	*Aesculus arguta*
Common beebush (Whitebrush)	*Aloysia gratissima*
Indigobush (False Indigo)	*Amorpha fruticosa*
Roosevelt-weed	*Baccharis neglecta*
Argarita (Mahonia)	*Berberis trifoliolata*
American beautyberry	*Callicarpa americana*
Buttonbush	*Cephalanthus occidentalis*
Eastern redbud	*Cercis canadensis*
Texas redbud	*Cercis canadensis var. texensis*
Roughleaf dogwood	*Cornus drummondii*
Downy hawthorn	*Crataegus mollis*
Greenhawthorn	*Crataegus reverchoni*
Common persimmon	*Diospyros virginiana*
46 Elbowbush	*Forestiera pubescens*
Carolina buckthorn	*Frangula caroliniana (Rhamnus caroliniana)*
Possum-haw	*Ilex decidua*
Yaupon Holly	*Ilex vomitoria*
Texas Walnut (Nogalito, Little walnut)	*Juglans microcarpa*
Mock orange	*Philadepphus pubescens*
Chickasaw plum	*Prunus angustifolia*
Oklahoma plum (Sand plum)	*Prunus gracilis*
Mexican plum	*Prunus mexicana*
Hog plum	*Prunus rivularis*
Hoptree	*Ptelea trifoliata var. mollis*
Flameleaf sumac	*Rhus copallinum*
Smooth sumac	*Rhus glabra*
Buffalo currant	*Ribes aureum*
White prairie rose	*Rosa foliolosa*
Elderberry	*Sambucus nigra var. canadensis*
Eve`s necklace	*Sophora affinis*
Coralberry	*Symphoricarpos orbiculatus*
Mexican buckeye (Texas buckeye)	*Ungnadia speciosa*
Farkleberry	*Vaccinium arboreum*
Rusty blackhaw	*Viburnum rufidulum*
Arkansas yucca	*Yucca arkansana*
Lotebush	*Ziziphus obtusifolia*
Peppervine	*Ampelopsis arborea*
Heartleaf ampelopsis	*Ampelopsis cordata*
Pipevine	*Aristolochia tomentosa*

Table E-2: Native Plants List – Small Trees and Shrubs	
Common Name	**Botanical Name**
Rattan vine	*Berchemia scandens*
Trumpet vine	*Campsis radicans*
Ballonvine	*Cardiospermum halicacabum*
Cowitch (Ivy-treevine, sorrelvine)	*Cissus incisa*
Old-man's-beard	*Clematis drummondii*
Bluebill (Leather-flower)	*Clematis pitcheri*
Carolina snailseed	*Cocculus carolinus*
Sharp-pod morning glory	*Ipomoea cordatotriloba var. cardatrtriloba*
Cotton morning glory	*Ipomoea cordatotriloba var. torreyana*
Coral honeysuckle	*Lonicera sempervirens*
Virginia creeper	*Parthenocissus quinquefolia*
Blackberry	*Rubus oklahomus*
47 Dewberry	*Rubus trivialis*
Greenbriar	*Smilax bona-nox*
Bristly greenbriar	*Smilax tamnoides*
Summer grape	*Vitis aestivalis*
Mustang grape	*Vitis mustangensis*
Riverbank grape	*Vitis riparia*

Table E-3: Native Plants List – Grasses	
Common Name	**Botanical Name**
Elliott's bentgrass (Annual tickle grass)	*Agrostis elliottiana*
winter bentgrass (Tickle grass)	*Agrostis hyemalis*
Big bluestem	*Andropogon gerardii*
Bushy bluestem	*Andropogon glomeratus*
Splitbeard bluestem	*Andropogon ternarius*
Broomsedge bluestem	*Andropogon virginicus*
Oilfield threeawn (Prairie threeawn)	*Aristida oligantha*
Purple threeawn	*Aristida purpurea*
Silver bluestem	*Bothriochloa laguroides*
Sideoats grama	*Bouteloua curtipendula*
Blue grama	*Bouteloua gracilis*
Hairy grama	*Bouteloua hirsuta*
Texas grama	*Bouteloua rigidiseta*
Red grama	*Bouteloua trifida*
Erect brachyelytrum	*Brachyelytrum erectum*
Downy brome	*Bromus pubescens*
Buffalograss	*Buchloe dactyloides*
Broadleaf woodoats (Inland sea-oats)	*Chasmanthium latifolium*
Hooded windmillgrass (Crowfoot grass)	*Chloris cucullata*
Short-spike windmillgrass	*Chloris subdolichostachya*
Tumble windmillgrass	*Chloris verticillata*
Feather finger grass (Showy chloris)	*Chloris virgata*
Carolina jointtail	*Coelorachis cylindrica*
Fall witchgrass	*Digitaria cognata*
American barnyard grass	*Echinochloa muricata*
Canada wildrye	*Elymus canadensis*
Virginia wildrye	*Elymus virginicus*
Gummy lovegrass	*Eragrostis curtipedicellata*
Big-top lovegrass	*Eragrostis hirsuta*
Plains lovegrass	*Eragrostis intermidia*
Spreading lovegrass	*Eragrostis pectinata*
Creeping lovegrass	*Eragrostis reptans*
Poverty droopseed	*Sporobolus vaginiflorus*
White tridens	*Tridens albescens*
Purpletop (redtop, purpletop tridens)	*Tridens flavus*
Longspike tridens	*Tridens strictus*
Eastern gammagrass	*Tripsacum dactyloides*
Prairie trisetum	*Trisetum interruptum*
Browntop signalgrass (Hurrah grass)	*Urochloa fasciculata*

Table E-3: Native Plants List – Grasses	
Common Name	**Botanical Name**
Broadleaf signalgrass	*Urochloa platyphylla*
Texas panicum (Texas signalgrass)	*Urochloa texana*
Common sixweeksgrass	*Vulpia octoflora*

Table E-4: Native Plants List – Herbaceous Wetland	
Common Name	**Botanical Name**
Ear-leaf ammannia	*Ammannia auriculata*
Purple ammannia (Toothcup)	*Ammannia coccinea*
Water-hyssop	*Bacopa monnieri*
Disk water-hyssop	*Bacopa rotundifolia*
Texas bergia (waterwort)	*Bergia texana*
Caric sedge (Benjamin's sedge)	*Carex bushii*
Davis' Caric sedge	*Carex davisii*
Heavy-fruit caric sedge	*Carex gravida*
Few-flower caric sedge	*Carex hyalina*
Foxtail caric sedge	*Carex vulpinoidea*
Taper-leaf flat sedge	*Cyperus acuminatus*
Yellow flat sedge	*Cyperus flavescnes*
Slender flat sedge	*Cyperus lupulinus*
Fragrant flat sedge	*Cyperus odoratus*
Bent-awn flat sedge	*Cyperus reflexus*
One-flower flat sedge	*Cyperus retroflexus*
Sedge	*Cyperus setigerus*
Burhead (Erect burhead)	*Echinodorus berteroi*
Creeping burhead	*Echinodorus cordifolius*
Needle spikerush	*Eleocharis acicularis*
Spikerush	*Eleocharis geniculata*
Spikerush	*Eleocharis monteicensis*
Large-spike spikerush	*Eleocharis palustris*
Dwarf spikerush	*Eleocharis parvula*
Square-stem spikerush	*Eleocharis quadrangulata*
Horsetail (Scouring-rush)	*Equisetum hyemale*
Fimbristylis	*Fimbristylis puberula*
Umbrella sedge	*Fuirena simplex*
Bladderpod (Bagpod)	*Glottidium vesicarium*
Blue mud plantain	*Heteranthera limosa*
Water-pennywort	*Hydrocotyle umbellata*
Dudley's rush	*Juncus dudleyi*
Common rush (Soft rush)	*Juncus effusus*
Ring-seed rush	*Juncus filipendulus*
Inland rush	*Juncus interior*
Grassleaf rush	*Juncus marginatus*
Torrey's rush	*Juncus torreyi*
Water willow	*Justicia americana*
Slender-leaf flat sedge	*Kyllinga pumila*

Table E-4: Native Plants List – Herbaceous Wetland	
Common Name	**Botanical Name**
Frogfruit (Lance-leaf frogfruit)	*Lippia lanceolata*
Frogfruit (Turkey tangle)	*Lippia nodiflora*
Seedbox (Rattlebox)	*Ludwigia alternifolia*
Primrose-willow	*Ludwigia decurrens*
Creeping seedbox (Torrey's seedbox)	*Ludwigia glandulosa*
Water primrose	*Ludwigia prploides*
Floating water primrose (Creeping primrose)	*Ludwigia repens*
Water horehound (American bugleweed)	*Lycopus americanus*
Lance-leaf loosestrife	*Lythrum alatum*
California loosestrife	*Lythrum californicum*
Prostrate water-hyssop	*Mecardonia procumbens*
Lax hornpod	*Mitreola petiolata*
Water pepper (Swamp smartweed)	*Polygonum hydropiperoides*
Pink smartweed	*Polygonum pensylvanicum*
Water smartweed	*Polygonum punctatum*
Pleat-leaf knotweed	*Polygonum tenue*
Pickerelweed	*Pontederia cordata*
Star-rush white-top sedge (Umbrella grass)	*Rhynchospora colorata*
Toothcup	*Rotala remosior*
Common arrowhead (Duck potato, Wapato)	*Sagittaria latifolia*
Delta arrowhead	*Sagittaria platyphylla*
Lizard's tail	*Saururus cernuus*
Giant bulrush	*Schoenoplectus californicus*
Three-square bulrush (American bulrush)	*Schoenoplectus pungens*
Soft-stem bulrush (Great bulrush)	*Schoenoplectus tabernaemontani*
Rattlebush	*Sesbania drummondii*
Southern cattail	*Typha domingensis*
Common cattail	*Typha latifolia*

Table E-5: Native Plants List – Aquatic Plants	
Common Name	**Botanical Name**
Larger waterwort	*Callitriche heterophylla*
Coontail	*Ceratophyllum demersum*
Water stargrass	*Heteranthera dubia*
Umbrella water-pennywort	*Hydrocotyle umbellata*
Lesser duckweed	*Lemna aequinoctialis*
Southern naiad	*Najas guadalupensis*
Lotus	*Nelumbo lutea*
Spatterdock (Cow lily, Yellow pond lily)	*Nuphar advena*
White water-lily	*Nymphaea odorata*
Water-thread pondweed	*Potamogeton diversifolia*
Long-leaf pondweed	*Potamogeton nodosus*
Baby pondweed	*Potamogeton pusillus*
Sago pondweed	*Stuckenia pectinatus*
Cone-spur bladderwort	*Utricularia gibba*
Wild celery (Eel grass)	*Vallisneria americana*
Common poolmat (horned pondweed)	*Zannichelia palustrus*

Table E-6: Native Plants List – Ferns	
Common Name	**Botanical Name**
Engelmann's Adder's tongue	*Ophioglossum engelmannii*
Adder's tongue	*Ophioglossum vulgatum*
Purple cliff-brake	*Pellaea atropurpurea*
Common woodsia	*Woodsia obtusa*

Table E-7: Native Plants List – Cacti	
Common Name	**Botanical Name**
Pinapple cactus	*Coryphantha sulcata*
Pincushion cactus	*Coryphantha vivipara*
Plains nipple cactus	*Escobaria missouriensis*
Eastern prickly-pear	*Opuntia humifusa*
Plains prickly-pear	*Opuntia macrorhiza*
Brown-spine prickly-pear	*Opuntia phaeacantha var. major*
Green-flower cholla (Jumping cactus)	*Opuntia tunicata*

Table E-8: Native Plants List – Forbs (Wildflowers)	
Common Name	**Botanical Name**
Prairie acacia	*Acacia angustissima*
Hop hornbeam	*Acalypha ostryifolia*
Virginia copperleaf	*Acalypha virginica*
Western yarrow	*Achillea millefolium*
Wild onion (Meadow garlic)	*Allium canadense*
Prairie onion	*Allium drummondii*
Blue star (Texas slimpod)	*Amsonia ciliata*
Ble star (Willow slimpod)	*Amsonia tabernaemontana*
Blue funnel lily	*Androstephium coeruleum*
Tenpetal anemone	*Anemone berlandieri*
Carolina anemone	*Anemone caroliniana*
Western rock-jasmine	*Anrdosac occidentalis*
Pussytoes anemone	*Antennaria parlinii*
Arkansas lazy daisy	*Aphanostpehus skirrhobasis*
Prairie dogbane (Indian-hemp)	*Apocynum cannabinum*
Green-dragon (Jack-in-the-pulpit)	*Arisaema dracontium*
Indian plantain	*Arnoglossum plantagineum (Cacalia plantaginea)*
Antelope-horns (trailing milkweed)	*Asclepias asperula*
Butterfly milkweed	*Asclepias tuberosa*
Green-flower milkweed	*Asclepias viridiflora*
Green milkweed	*Asclepias viridis*
Drummond's aster	*Aster drummondii*
Heath aster	*Aster ericoides*
Aromatic aster	*Aster oblongifolius*
Late purple aster	*Aster patens var. gracilis*
Silky aster	*Aster pratensis*
Saltmarsh aster	*Aster subulatus*
Bent-pod milk-vetch	*Astragalus distortus*
Slim-pod milk-vetch	*Astragalus leptocarpus*
Lotus milk-vetch	*Astragalus lotiflorus*
Western daisy	*Astranthium intefrifolium*
Plains wild indigo	*Baptisia bracteata*
Green wild indigo	*Baptisia sphaerocarpa*
Texas green-eyes	*Berlandiera betonicifolia (B. texana)*
Prairie Bishop's weed	*Biflora americana*
Scarlet spiderling	*Boerhavia diffusa*
Erect spiderling	*Boerhavia erecta*
Plains kuhnia (False boneset)	*Brickellia eupatorioides var. corymbulosa*
Plains winecup (Plains poppy-mallow)	*Callirhoe alcaeoides*

Table E-8: Native Plants List – Forbs (Wildflowers)	
Common Name	**Botanical Name**
Winecup (Purple poppy-mallow)	*Callirhoe involucrata*
Palmleaf poppy-mallow (Finger poppy-mallow)	*Callirhoe pedata (C. digitata)*
Sundrops (Squarebud day primrose)	*Calylophus berlandieri*
Yellow sundrops (yellow eveving-primrose)	*Calylophus serrulatus*
Horseherb (Prostrate lawnflower)	*Calyptocarpus vialis*
Wild hyacinth	*Camassia scilloides*
Indian paintbrush	*Castilleja indivisa*
Redroot (Jersey tea)	*Ceanothus herbaceus*
Basketflower	*Centaurea americana*
Mountain pink	*Centaurium beyrichii*
Lady Bird's centaury	*Centaurium texense*
Short-stalked chickweed	*Cerastium brachypodum*
Nodding chickweed	*Cerastium nutans*
Wild cherry	*Chaerophyllum tainturieri*
Common least daily	*Chaetopappa asteroides*
Partridge pea	*Chameachrista fasciculata (Cassia fasciculata)*
Sensitive pea	*Chameachrista nicitans (Cassia nictitans)*
Pit-seed goosefoot	*Chenopodium berlandieri*
Thick-leaf goosefoot	*Chenopodium pratericola*
Soft golden aster (Camphorweed)	*Chrysopsis pilosa*
Tall thistle	*Cirsium altissimum*
Bull thistle	*Cirsium horridulum*
Texas thistle	*Cirsium texanum*
Violet collinsia	*Collinsia voilacea*
Erect dayflower	*Commelina erecta*
Texas bindweed	*Convolvulus equitans*
Horseweed	*Conyza canadensis*
Rain-lily	*Cooperia drummondii*
Lance Coreopsis	*Coreopsis lanceolata*
Plains coreopsis	*Coreopsis tinctoria*
Rock coreopsis	*Coreopsis wrightii*
Mealy fumewort	*Corydalis crystallina*
Scratch daisy	*Croptilon hookerianum*
Woolly croton	*Croton capitatus*
Tropic croton	*Croton glandulosus*
One-seeded croton	*Croton monanthogynous*
Texas croton	*Croton texensis*
Buffalo gourd	*Cucubita foetidissima*
Texas Gourd	*Cucurbita texana*

Table E-8: Native Plants List – Forbs (Wildflowers)	
Common Name	**Botanical Name**
Winged pigweed	*Cycloloma atriplicifolium*
Showy prairie clover	*Dalae compacta*
Golden dalea	*Dalea aurea*
White prairie clover	*Dalea candida var candida*
Bigtop dalea	*Dalea enneandra*
Round-head dalea (White prairie clover)	*Dalea multiflora*
Angels Trumpet (Indian apple)	*Datura wrightii*
Rattlesnake-weed	*Daucus pusillus*
Prairie larkspur	*Delphinium carolinianum var. virescens*
Tansy mustard	*Descurainia pinnata*
Illinois bundleflower	*Desmanthus illinoensis*
Prairie bundleflower	*Desmanthus leptolobus*
Panicled tick-clover	*Desmodium paniculatum*
Sessile tick-clover	*Desmodium sessilifolium*
Tweedy's tick-clover	*Desmodium tweedyi*
Pony foot	*Dichondra carolinensis*
Woolly cotton-flower	*Dimorphocarpa wislizenii*
Rough buttonweed	*Diodia teres*
Low silverbush (Low wild mercury)	*Ditaxis humilis*
Shooting star	*Dodecatheon meadia*
Wedge-leaf draba (Whitlow-wort)	*Draba cuneifolia*
Broad-pod draba	*Draba platycarpa*
Carolina draba	*Draba reptans*
Clasping coneflower	*Dracopis amplexicaulis*
Snake Herb	*Dyschoriste linearis*
Blacksamson	*Echinacea angustifolia*
Purple coneflower	*Echinacea atrorubens*
Yarva de tajo (Pieplant)	*Eclipta prostrata*
Englemann daisy	*Englemannia peristenia (E. pinnatifida)*
Basin fleabane	*Erigeron geiseri*
Philadelphia fleabane	*Erigeron philadelphicus*
Annual wild buckwheat	*Eriogonum annuum*
Longleaf wild buckwheat	*Eriogonum longifolium*
Heart-sepal wild buckwheat	*Eriogonum multiflorum*
Prairie fleabane	*Eriogonum strigosus*
Texas stork's bill	*Erodium texanum*
Brushy eryngo	*Eryngium diffusum*
Hooker's enyngo	*Eryngium hookeri*
Leavenworth eryngo	*Eryngium leavenworthii*

Table E-8: Native Plants List – Forbs (Wildflowers)	
Common Name	**Botanical Name**
Rattlesnake master (Button snakeroot)	*Eryngium yuccifolium*
Western wallflower	*Erysimum capitatum*
Tall thoroughwort	*Eupatorium altissimum*
Blue mist flower	*Eupatorium coelestinum*
Late-flowering boneset	*Eupatorium serotinum*
Snow-on-the-prairie	*Euphorbia bicolor*
Fire-on-the-mountain	*Euphorbia cyanthophora*
Toothherd spurge	*Euphorbia dentata*
Snow-on-the-mountain	*Euphorbia marginata*
Weak spurge	*Euphorbia tetrapoda*
Texas spreadwing	*Eurytaenia texana*
Bluebells	*Eustoma russellianum (E. grandiflorum)*
Big-head pygmycudweed	*Evax prolifera*
Spring pygmycudweed	*Evax verna*
Shaggy dwarf morning-glory	*Evolvulus nuttallianus*
Silver dwarf morning-glory	*Evolvulus sericeus*
Florida snake cotton	*Froelichia floridana*
Prairie gaillardia (Lanceleaf gaillardia)	*Gaillardia aestivalis*
Indian blanket	*Gaillardia pulchella*
Fragrant gaillardia	*Gaillardia sauvis*
Woods bedstraw (Wild licorice)	*Galium circaezans*
Hairy bedstraw	*Galium pilosum*
Plains gaura	*Gaura brachycarpa*
Sweet gaura (Beeblossom)	*Gaura drummondii*
Velvetweed (Lizard-tail gaura)	*Gaura parviflora*
Wavy-leaf gaura (Wavyleaf beeblossom)	*Gaura sinuata*
Wild honeysuckle	*Gaura suffulta*
Crane's bill (Carolina geranium)	*Geranium carolinianum*
White avens	*Geum canadense*
Dakota vervain	*Glandularia bipinnatifida (Verbena bipinnatifida)*
Rose vervain	*Glandularia canadensis (Verbena canadensis)*
Bladderpod (Bagpod)	*Glottidium vesicarium*
Lonestar gumweed (Little-head gumweed)	*Grindelia adenodonta*
Narrow-leaf gumweed	*Grindelia lanceolata*
Prairie bluets	*Hedyotis nigricans*
Common sunflower	*Helianthus annuus*
Texas blueweed (Blue-weed sunflower)	*Helianthus cilaris*
Maximilian Sunflower	*Helianthus maximiliani*
India heliotrope (turnsole)	*Heliotropium indicum*

Table E-8: Native Plants List – Forbs (Wildflowers)	
Common Name	**Botanical Name**
Pasture heliotrope	*Heliotropium tenellum*
Bladdermallow (Net-Vein herissantia)	*Herissantia crispa*
Gray golden-aster	*Heterotheca canescens*
Camphorweed	*Heterotheca subaxillaris*
Hawkweed	*Hieracium gronovii*
Nodding green violet	*Hybanthus verticillatus*
Carolina wooly-white (Old-plainsman)	*Hymenopappus acabiosaeus*
Old-plainsman (Woolly-white)	*Hymenopappus artemisifolius*
Spotted St. John's wort	*Hypericum punctatum*
Scarlet pea	*Indigofera miniata*
Standing cypress	*Ipomopsis rubra*
Sumpweed (Marsh-elder)	*Iva annua*
Warty calrop	*Kallstroemia parviflora*
Trailing ratany	*Krameria lanceolata*
Virginia dwarfdandelion	*Krigia virginica*
Wright's dwarfdandelion	*Krigia wrightii*
Wild lettuce	*Lactuca canadensis*
Western wild lettuce	*Lactuca ludoviciana*
Narrow-leaf pinweed	*Lechea tenuifolia*
Virginia pepperweed	*Lepidium virginicum*
Hairy bush-clover	*Lespedeza hirta*
Trailing bush-clover	*Lespedeza procumbens*
Tall bush-clover	*Lespedeza stuevei*
Slender lepedeza	*Lespedeza virginicum*
White bladderpod	*Lesquerella gracilis*
Narrow-leaf conobea	*Leucospora multifida*
Tall gayfeather (Tall blazing star)	*Liatris aspera*
Pink-scale gayfeather (Handsome blazing star)	*Liatris elegans*
Narrow-leaf gayfeather	*Liatris mucronata*
Prairie blazing star (Kansas gayfeather)	*Liatris pynchostachya*
Smooth gayfeather (Scaly blazing star)	*Liatris squarrosa var. glabrata*
Arkansas dogshade	*Limnosciadium pinnatum*
False pimpernel	*Lindernia dubia*
Texas yellow star	*Lindheimera taxana*
Small meadow flax	*Linum pratense*
Stiffstem flax	*Linum rigidum*
Puccoon (Carolina gromwell)	*Lithospermum caroliniense*
Narrowleaf gromwell (Narrowleaf puccoon)	*Lithospermum incisum*
Cardinal flower	*Lobelia cardinalis*

Table E-8: Native Plants List – Forbs (Wildflowers)	
Common Name	**Botanical Name**
Carrot-leaf lomatium	*Lomatium foeniculaceum*
Deervetch (Prairie trefoil)	*Lotus purshianus (L. unifoliolatus)*
Texas bluebonnet	*Lupinus texensis*
Texas skeleton plant	*Lygodesmia texana*
Turks Cap (Wax mallow)	*Malvaviscus arboreus v. drummondii*
Barbara's buttons (Puffballs)	*Marshallia caespitosa*
Creeping cucumber	*Melothria pendula*
Stickleaf (Chickenthief)	*Mentzelia oilgosperma*
White four-o'clock	*Mirabilis albida*
Giant four-o'clock	*Mirabilis gigantea*
Narrow-leaf four-o'clock	*Mirabilis linearis*
Wild four-o'clock	*Mirabilis nyctaginea*
Carolina bristlemallow	*Modiola caroliniana*
Lemon mint (Lemon beebalm)	*Monarda citriodora*
Basil beebalm	*Monarda clinopodioides*
Wild bergamont	*Monarda fistulosa*
Spotted beebalm	*Monarda punctata*
Poverty-weed	*Monolepis nuttalliana*
Spring forget-me-not	*Myosotis macrosperma*
Southern forget-me-not	*Myosotis verna*
tiny mousetail	*Myosurus minimus*
Prairie celestial	*Nemastylis geminiflora*
Yellow puff	*Neptunia lutea*
Crow poison (False garlic)	*Nothoscordum bivalve*
Texas toad-flax	*Nuttallanthus texanus*
Scarlet muskflower	*Nyctaginia capitata*
Cutleaf evening primrose	*Oenothera laciniata*
Four-point evening primrose	*Oenothera rhombipetala*
Spack evening primrose	*Oenothera spachiana*
Showy evening primrose	*Oenothera speciosa*
Stemless evening primrose	*Oenothera triloba*
Soft-hair marbleseed	*Onosmodium bejariense*
Aniseroot	*Osmorhiza longistylis*
Common yellow oxalis	*Oxalis stricta*
Violet woodsorrel	*Oxalis vioacea*
Prairie groundsel	*Packera plattensis (Senecio plattensis)*
Small palafoxia	*Palafoxia callosa*
Rose palafoxia	*Palafoxia rosea*
Passionflower	*Passiflora incarnata*

Table E-8: Native Plants List – Forbs (Wildflowers)	
Common Name	**Botanical Name**
Tall-bread scurf-pea	*Pediomelum cuspidata (Psoralea cuspidata)*
Rock scurf-pea	*Pediomelum reverchonii (Psoralea reverchonii)*
Round-leaf scurf-pea	*Pediomelum rhombifolium*
Foxglove	*Penstemon cobaea*
Beardtongue	*Penstemon laxiflorus*
Blue curls	*Phacelia congesta*
Annual phlox (Pride-of-Texas)	*Phlox drummondii var. mcallisterii*
Prairie Phlox	*Phlox pilosa*
Drummond's leaf-flower	*Phyllanthus abnormis*
Knotweed leaf-slower	*Phyllanthus polygonoides*
Cut-leaf ground-cherry	*Physalis angulata*
Beach ground-cherry	*Physalis cinerascens*
Downy groundcherry (Husk tomato)	*Physalis pubescens*
Finger flase dragonhead	*Physostegia digitalis*
Beautiful false dragonhead	*Physostegia pulchella*
Obedient Plant	*Physostegia virginiana var. praemorse*
Pokeweed	*Phytolacca americana*
Bracted plantain (Bottlebrush plantain)	*Plantago aristata*
Prairie plantain (Slender plantain)	*Plantago elongata*
Slender plantago (Slim-spike plantago)	*Plantago heterophylla*
Bristle-bracted plantain	*Plantago patagonica*
Red-seed plantain (Tallow-weed)	*Plantago rhodosperma*
Pale-seed plantain	*Plantago virginica*
Purple pluchea (Marsh fleabane)	*Pluchea odorata*
Clammyweed	*Polansia dodecandra*
White milkwort	*Polygala alba*
Pink milkwort (Procession flower)	*Polygala incarnata*
Pleat-leaf knotweed	*Polygonum tenue*
Juniper-leaf	*Polypremum procumbens*
Prairie parsley	*Polytaenia nuttallii*
Common selfheaf (Heal-all)	*Prunella vulgaris var. lanceolata*
Edible scurf-pea	*Psoralea hypogaeum var. subulatum*
Wild alfalfa (Slim-leaf scurf-pea)	*Psoralea tenuiflora*
Mock bishop's weed	*Ptilimnium nuttallii*
False dandelion (Carolina desert-chickory)	*Pyrrhopappus carolinianus*
Texas dandelion (Smallflower desert-chickory)	*Pyrrhopappus pauciflorus*
Mexican hat (Upright prairie coneflower)	*Ratibida columnifera*
Pigeonberry (Rougeplant)	*Rivina humilis*
Blackeyed Susan	*Rudbeckia hirta*

Table E-8: Native Plants List – Forbs (Wildflowers)	
Common Name	**Botanical Name**
Low ruellia	*Ruellia humilis*
Pale dock	*Rumex altissimus*
Heart-wing sorrel	*Rumex hastatulus*
Meadow pink	*Sabatia campestris*
Buckley's sabatia	*Sabatia formosa*
Trailing pearlwort	*Sagina decumbens*
Blue sage	*Salvia azurea*
Tropical sage	*Salvia coccinea*
Engelmann's sage	*Salvia engelmannii*
Mealycup sage	*Salvia farinacea*
Texas sage	*Salvia texana*
Thin-leaf brookweed	*Samolus valerandi*
Black snakeroot	*Sanicula canadensis*
Catclaw sensitive briar	*Schrankia nuttallii (Mimosa nutallii)*
Roemer sensitive briar	*Schrankia roemeriana (Mimosa roemeriana)*
Small scullcap	*Scutellaria parvula*
Wright's skullcap	*Scutellaria wrightii*
Yellow stonecrop	*Sedum nuttallianum*
Texas groundsel	*Senecio ampullaceus*
Cofee-bean	*Sesbania herbacea (S. macrocarpa)*
Rock cress	*Sibara virginica*
Bur cucumber	*Sicyos angulatus*
Spreading fanpetal	*Sida abutifolia*
Prickly fanpetals	*Sida spinosa*
Sleepy catchfly	*Silene antirrhina*
Widow's frill	*Silene stellata*
Compassplant	*Silphium laciniatum*
Sword-leaf blue-eyed grass	*Sisyrinchium chilense*
Dotted blue-eyed grass	*Sisyrinchium pruinosum (S. langloisii)*
American nightshade	*Solanum ptychenthum (Solanum americanum)*
Common goldenrod	*Solidago canadensis*
Tall goldenrod	*Solidago gigantea*
Stiff goldenrod	*Solidago rigida*
Elm-leaf goldenrod	*Solidago ulmifolia*
Forked scaleseed	*Spermolepis divaricata*
beggar's-lice (Bristly scaleseed)	*Spermolepis echinata*
Spreading scaleseed	*Spermolepis inermis*
Slender ladies' tresses	*Spiranthes lacera*
Mousesear	*Stachys crenata*

Table E-8: Native Plants List – Forbs (Wildflowers)	
Common Name	**Botanical Name**
False gaura	*Stenosiphon linifolius*
Smooth jewelflower (Smooth twistflower)	*Streptanthus hyacinthoides*
Trailing wild bean	*Strophostyles helvola*
Smooth-seed wild bean	*Strophostyles leiosperma*
Sunbright (Prairie flameflower)	*Talinum parviflorum*
Goat's rue (Virginia tephrosia)	*Tephrosia virginiana*
Sawtooth nerveray	*Tetragonotheca ludoviciana*
Fineleaf four-nerve daisy	*Tetraneuris linearifolia (Hymenoxys linearifolia)*
Wood sage	*Teucrium canadense*
Greenthread	*Thelesperma filifolium*
Small Bristle-leaf (Tiny Tim)	*Thymophylla tenuiloba*
Ohis spiderwort	*Tradescantia ohioensis*
Tharp's spiderwort	*Tradescantia tharpii*
Peanut clover	*Trifolium polymorphum*
Venus' looking glass	*Triodanis holzingeri*
Slender-leaved Venus looking-glass	*Triodanis leptocarpa*
Hen and Chickens	*Triodanis perfoliata*
Beaked cornsalad	*Valerianella radiata*
Wood's cornsalad	*Valerianella woodsiana*
Bracted vervain	*Verbana bractaeta*
Texas vervain	*Verbena halei*
Hoary vervain	*Verbena stricta*
White vervain	*Verbena urticifolia*
Gulf vervain (Course vervain)	*Verbena xutha*
Cowpen daisy (Golden crownbeard)	*Verbesina encelioides*
White Crownbeard (Frostweed, Iceplant)	*Verbesina virginica*
Western ironweed	*Vernonia baldwinii*
Purslane speedwell (Neckweed)	*Veronica peregrina*
Blue violet	*Viola palmata*
Common blue violet	*Viola sororia*
Carolina violet	*Viola villosa*
Prairie brazoria	*Warnockia scutellarioides*
Orange zexmenia	*Wedelia texana (Zexmenia hispida)*
Texas sleepy daisy	*Xanthisma texanum*

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Section 1: Introduction

1.1 Title and Effective Date

1.1.1 This document is the Design Criteria Manual of the City of Denton, Texas. It shall be officially known and cited as the "Denton Design Criteria Manual," and is referred to internally in this document as "this DCM" and "this Manual."

1.1.2 This DCM shall become effective on JanuaryJuly 1, 20264.

1.2 Purpose

The purpose of the Denton Design Criteria Manual (DCM) is to provide minimum, non-exhaustive guidelines for the design and construction of ***solid waste, stormwater, transportation, water and wastewater, and streetlight infrastructure*** within the City of Denton, Texas and its extraterritorial jurisdictions. The criteria established in this Manual have been developed from a review of various applicable publications, regulatory requirements, and City of Denton offices which oversee the design, construction and maintenance of the facilities.

These guidelines are to be used by design engineers in the City of Denton Capital Projects and Engineering Departmentivision, consulting engineers employed by the City, and engineers of subdivision and land development infrastructure projects proposed for construction and acceptance by the City, within the City and its extraterritorial jurisdictions.

Along with this Manual, the Denton Development Code (DDC) and relevant submittal checklists should be consulted for additional criteria. ***The criteria established in this Manual do not supersede the criteria contained in the DDC.*** In the case of conflict among this Manual, City of Denton Standard Details, or other cited regulations and standards, the more stringent requirement shall apply.

This DCM is ***not*** intended to be an all-inclusive design document for all circumstances and conditions. The DDC and City of Denton Code of Ordinances must be consulted for possible impacts to the proposed design. The Federal Government, the State of Texas, NCTCOG, Denton County, Denton County Transit Authority (DCTA), and other related organizations and resources should be consulted for additional criteria, as may be deemed necessary.

1.3 Organization

In addition to the design criteria established in this DCM, guidance is also provided for design deviations from the required design criteria. The contents of this Manual are categorized into sections shown below:

A. Section 1: Introduction
B. Section 2: Abbreviations and Definitions
C. Section 3: Solid Waste Design
D. Section 4: Stormwater Design
E. Section 5: Transportation Design
F. Section 6: Water and Wastewater Design
G. Section 7: Streetlight Design Criteria
H. Section 8: Design Deviations

Section 2: Abbreviations and Definitions

2.1 Abbreviations

AASHTO	American Association of State Highway and Transportation Officials
ADA	Americans with Disabilities Act
APBP	Association of Pedestrian and Bicycle Professionals
ASTM	American Society for Testing and Materials
AWSC	All-Way Stop Control
AWWA	American Water Works Association
BFE	Base Flood Elevation
BFR	Barrier Free Ramp
BOC	Back of Curb
BMP	Best Management Practices
CCN	Certificate of Convenience and Necessity
cfs	cubic feet per second
CLOMR	Conditional Letter of Map Revision
COA	Condominium Owner's Association
CP	Cathodic Protection
cu. ft.	cubic feet
cu. in.	cubic inches
DCAD	Denton Central Appraisal District
DCM	Design Criteria Manual
DCTA	Denton County Transit Authority
DDC	Denton Development Code
DFW	Dallas-Fort Worth Metroplex
DIP	Ductile-Iron Pipe
DRP	Development Review Process
DSA	Down Stream Assessment
EOL	End-of-Line
ESA	Environmentally Sensitive Area
ft.	foot or feet
FEMA	Federal Emergency Management Agency
FFE	Finished Floor Elevation

FHWA	Federal Highway Administration
FIRM	Federal Insurance Rate Map
FIS	Flood Insurance Study
FM	Farm to Market
fps	feet per second
FSE	Food Service Establishment
gal.	gallon(s)
GPCD	gallons per capita per day
GPD	gallons per day
GPM	gallons per minute
GPS	Global Positioning System
HDPE	High Density Polyethylene
HEC-HMS	Hydrologic Engineering Center's Hydrologic Modeling System
HEC-RAS	Hydrologic Engineering Center's River Analysis System
HGI	Hydromechanical Grease Interceptor
HGL	Hydraulic Grade Line
HOA	Home Owners' Association
IBC	International Building Code
ID	Inner Diameter
IFC	International Fire Code
IH	Interstate Highway
in.	inch(es)
IPC	International Plumbing Code
ITE	Institute of Transportation Engineers
*i*SWM™	Integrated Stormwater Management
kg.	kilogram(s)
lb.	pound or pounds
LOMR	Letter of Map Revision
LOS	Level-of-Service
MEP	Mechanical, Electrical, and Plumbing
MGD	Million Gallons per Day
mL	milli-liter(s)
mph	miles per hour

NAVD	North American Vertical Datum
NCHRP	National Cooperative Highway Research Program Report
NCTCOG	North Central Texas Council of Governments
NFIP	National Flood Insurance Program
NFPA	National Fire Protection Association
NGVD	National Geodetic Vertical Datum
NOAA	National Oceanic and Atmospheric Administration
PHT	Peak-Hour Trips
PMF	Probable Maximum Flood
PMP	Probable Maximum Precipitation
POA	Property Owners' Association
POTW	Publicly Owned Treatment Works
PROWAG	Public Rights of Way Accessibility Guidelines
psi	pounds per square inch
PUCT	Public Utilities Commission of Texas
PUE	Public Utility Easement
PVC	Polyvinyl Chloride
PZC	Planning and Zoning Commission
RCP	Reinforced Concrete Pipe
ROW	Right-of-Way
RPBA	Reduced Pressure Backflow Assembly
SCADA	Supervisory Control and Data Acquisition
SCS	Soil Conservation Service
SDR	Standard Dimension Ratio
SFE	Single-Family Equivalent
SETP-PD	Safety End Treatment Plan – Parallel Drainage
SFHA	Special Flood Hazard Area
SH	State Highway
sq. ft.	square feet
sq. mi.	square mile(s)
SWFMA	Stormwater Facility Maintenance Agreement or Maintenance Agreement
TAC	Texas Administrative Code
TAS	Texas Accessibility Standards

TCEQ	Texas Commission on Environmental Quality
TDLR	Texas Department of Licensing and Registration
TGA	Trip Generation Assessment
TIA	Traffic Impact Analysis
TMUTCD	Texas Manual on Uniform Traffic Control Devices
TSS	Total Suspended Solids
TxDOT	Texas Department of Transportation
U.S.	United States of America
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
VPD	Vehicle-trips per day
WOTUS	Waters of the United Stated of America
WMP	Water Master Plan
WSEL	Water surface elevation
w.s.f.u.	Water-Supply Fixture-Unit(s)
ZOI	Zone of Influence

2.2 Definitions

20-Year Horizon
The estimated traffic volume for the study area based on a 20-year growth period.

100-year Event
Event (rainfall or flood) that has a 1% chance of being equaled or exceeded in any given year.

Abutment
A wall supporting the end of a bridge or span and sustaining the pressure of the bordering earth.

Applicant
Any firm, entity, partnership, company, public utility company, or individual that submits a formal request or application.

Apron
A floor or lining of concrete, timber, or other suitable material at the toe of a dam, entrance or discharge side of a spillway, a chute, or other discharge structure, to protect the waterway from erosion from falling water or turbulent flow.

Area of Special Flood Hazard
The area designated as subject to flooding from the 1% chance flood on the flood insurance rate map. For purposes of these criteria, the term "special flood hazard area" is synonymous in meaning with the phrase "area of special flood hazard" and may be referred to as "SFHA".

Backwater
The rise of the water level upstream due to an obstruction or constriction in the channel.

Backwater Curve
The term applied to the longitudinal profile of the water surface in an open channel when flow is steady but non-uniform.

Baffles
Deflector vanes, guides, grids, gratings, or similar devices constructed or placed in flowing water, to: (1) check or effect a more uniform distribution of velocities; (2) absorb energy; (3) divert, guide, or agitate the stormwater flow; and (4) check eddy currents.

Baffle Chute
A drop structure in a channel with baffles for energy dissipation to permit the lowering of the hydraulic energy gradient in a short distance to accommodate topography.

Base Flood Elevation
The elevation shown on the Flood Insurance Rate Map (FIRM) and found in the accompanying Flood Insurance Study (FIS) for Zones A, AE, AH, A1-30, AR, V1-30, or VE that indicates the water surface elevation resulting from the flood that has a 1% chance of equaling or exceeding that level in any given year.

Calibration
Process of checking, adjusting, or standardizing operating characteristics of instruments and model appurtenances on a physical model or coefficients in a mathematical model. The process of evaluating the scale readings of an instrument in terms of the physical quantity to be measured.

Carrier Pipe
A pipe used to carry stormwater, water, or wastewater, as opposed to an exterior protective casing pipe.

Casing Pipe
An exterior protective pipe that encases a carrier pipe for various types of crossings, including roadways, creeks, and railroads. Also known as encasement pipe.

Channel
A man-made drainageway or watercourse, generally constructed to straighten a stream or increase its capacity.

Channel Roughness
Irregularities in channel configuration which attenuate the flow of water and dissipate its energy.

Chute
An inclined conduit or structure used for conveying water to a lower level.

City's Engineer
A Professional Engineer, licensed by the State of Texas, who is the subject matter expert of the relevant topic of discussion, and employed by the City of Denton.

Conduit
Any open or closed structure for conveying flowing water.

Corner Clip
ROW dedication at intersection corners to provide sufficient room for intersection visibility, pedestrian access, and other street facilities.

Critical Flow
The state of flow for a given discharge at which the specific energy is a minimum with respect to the bottom of the conduit. The Froude Number is equal to 1.0 for critical flow conditions.

Crown
The highest point on a transverse section of conduit or the highest point of a roadway cross-section.

Culvert
Large pipe or other conduit through which a small stream passes under a road or street.

Curb
A vertical or sloping structure located along the edge of a roadway, normally constructed integrally with the gutter, which strengthens and protects the pavement edge and clearly defines the pavement edge to vehicle operators.

Dam
A barrier constructed across a watercourse for the purpose of creating a reservoir or diverting water from a conduit or channel.

Degradation
The progressive general lowering of a stream channel by erosion, other than that caused by a constriction.

Department Reviewer
A member of a City of Denton department, designated by the Department Director, with subject matter expertise related to the Design Criteria Manual who is designated as being responsible for the review of design deviation requests.

Depression Storage
Collection and storage of rainfall in natural depressions after exceeding infiltration capacity of the soil.

Design Storm or Flood
The storm or flood which is used as the basis for design.

Detention
The storage of storm runoff for a controlled release during or immediately following the design storm.
1. Off-site detention - A detention pond located outside the boundary of the area it serves.
2. On-site detention - A detention pond which is located within and serves only a specific site or subdivision.
3. Regional detention - Detention facilities provided to control excess runoff based on a watershed-wide hydrologic analysis.

Development
Any man-made change to improved or unimproved real estate, including but not limited to, buildings or other structures, paving, drainage, or utilities. Development activities include: subdivision of land; construction or alteration of structures, roads, parking, fences, pools, signs, temporary uses, utilities, and other facilities; installation of septic systems; grading; excavation, mining or drilling operations; deposit of refuse, debris, or fill materials; and clearing of natural vegetative cover (with the exception of agricultural activities as defined and as permitted). Routine repair and maintenance activities are exempted.

Development Project Facilitation
Division within the City of Denton that assists developers move projects through the City's various development review process and authorized to process the review of design deviation requests.

Drop Structures
A sloping or vertical section of a channel designed to reduce the elevation of flowing water without increasing its velocity.

Energy Dissipaters
Engineered devices such as riprap aprons or concrete baffles placed at the outlet of storm water conveyance systems for the purpose of reducing the velocity, energy and turbulence of the discharged flow.

Entrance Head
The head required to cause flow into a conduit or other structure; it includes both entrance loss and velocity head.

Entrance Loss
Head lost in eddies or friction at the inlet to a conduit, headwall or structure.

Existing Traffic
Existing traffic conditions based on the most recent traffic counts. Existing traffic conditions do not include the traffic created or associated with the development.

Flash Flood
A flood of short duration with a relatively high peak rate of flow, usually resulting from a high intensity rainfall over a small area.

Flood Control
The elimination or reduction of flood losses by the construction of flood storage reservoirs, channel improvements, dikes and levees, by-pass channels, or other engineering works.

Flood Hazard Area
Area subject to flooding by 1% chance floods.

Flood Management or Flood Hazard Mitigation
Any program or activity designed to reduce damages from flooding, including stream erosion.

Floodplain
The area that is subject to flooding from the 1% chance flood. The floodplain includes the regulatory floodway and floodway fringe.

Floodway
The channel and adjacent lands of a watercourse that must be reserved in order to discharge the base flood without increasing the water surface elevation more than the regulatory designated height.

Floodway Fringe
The area located within the floodplain and outside the floodway.

Freeboard
The distance between the normal operating level and the top of the side of an open conduit left to allow for wave action, floating debris, or any other condition or emergency without overtopping the structure.

Frequency (of storms, floods)
Average recurrence interval of events, over long periods of time. Mathematically, frequency is the reciprocal of the exceedance probability.

Froude Number
A flow parameter, which is a measure of the extent to which gravitational action affects the flow. A Froude number greater than one (1) indicates supercritical flow and a value less than 1 subcritical flow. The simplest

form of the Froude number is given by the following equation:

$$F = V / (g D)^{0.5} \quad \textbf{[Eqn. 2.1]}$$

Where: V = Velocity
g = the acceleration due to gravity (32.2 ft/s^2)
D = depth

Fully Developed Conditions
A description of hydrologic conditions in a watershed, if the watershed has been completely built out based on the zoning and future land use maps of the City. If there is no designated future land use, the runoff coefficient will be assumed to be (0.6) for purposes of determining fully developed water surface elevations. This term is interchangeable with the term "Ultimate Developed Conditions". This is not to be confused with a Developed Floodplain as defined in Subchapter 9.2 of the DDC, which refers to the character of the streambed itself.

Gabion
A wire container filled with rock and used in the construction of dams, retaining walls, and protection against erosion.

Grade
1. The inclination or slope of a channel, canal, conduit, etc., or natural ground surface, usually expressed in terms of the percentage of number of units of vertical rise (or fall) per unit of horizontal distance.
2. The elevation of the invert of the bottom of a conduit, canal, culvert, sewer, etc.
3. The finished surface of a canal bed, road bed, top of an embankment, or bottom of excavation.

Gutter
A generally shallow waterway adjacent to a curb used to convey stormwater.

Headwater
1. The upper reaches of a stream near its sources;
2. The region where ground waters emerge to form a surface stream;
3. The water upstream from a structure.

Hydraulic Control
The hydraulic characteristic which determines the stage-discharge relationship in a conduit. The control is usually critical depth, tailwater depth, or uniform depth.

Hydraulic Grade Line
A line representing the pressure head available at any given point within the system.

Hydraulic Gradient
A hydraulic profile of the piezometric level of the water, representing the sum of the depth of flow and the pressure head. In open channel flow it is the water surface.

Hydraulic Jump
The hydraulic jump is an abrupt rise in the water surface which occurs in an open channel when water

flowing at supercritical velocity is retarded by water flowing at subcritical velocity. The transition through the jump results in a marked loss of energy, evidenced by turbulence of the flow within the area of the jump. The hydraulic jump is sometimes used as a means of energy dissipation.

Hydraulics
A branch of science that deals with practical applications of the mechanics of water movement.

Hydrograph
A graph showing stage, flow, velocity, or other property of water versus time at a given point on a stream or conduit. Examples include: Dimensionless Unit hydrograph, Unit Hydrograph.

Hydrology
The science dealing with the properties, distribution, and circulation of water on and below the Earth's surface and in the atmosphere.

Hyetograph
A histogram or graph of rainfall intensity versus time of storm.

Impervious
A term applied to a material through which water cannot pass or passes with great difficulty.

Infiltration
1. The entering of water through the interstices or pores of a soil or other porous medium.
2. The entrance of water from the ground into a sewer or drain through breaks, defective joints, or porous walls.
3. The absorption of water by the soil, either as it falls as precipitation, or from a stream flowing over the surface.

Inlet
Inlets are drainage structures used to collect surface water through grate or curb openings and convey it to storm drains or direct outlet to culverts.
Inlets used for the drainage of roadway surfaces can be divided into four major classes:
1. Grate Inlets – These inlets include grate inlets consisting of an opening in the gutter covered by one or more grates, and slotted inlets consisting of a pipe cut along the longitudinal axis with a grate or spacer bars to form slot openings.
2. Curb-Opening Inlets – These inlets are vertical openings in the curb covered by a top slab.
3. Combination Inlets – These inlets usually consist of both a curb-opening inlet and a grate inlet placed in a side-by-side configuration, but the curb opening may be located upstream of the grate.
4. Drop Inlet (Y-Inlet) -A storm drain intake structure typically located in unpaved areas. The inlet may extend above the ground level with openings on one or more sides of the inlet or it may be flush with the ground with a grated cover.

Intensity
As applied to rainfall, a rate usually expressed in inches per hour.

Interception
As applied to hydrology, refers to the process by which precipitation is caught and held by foliage, twigs,

and branches of trees, shrubs and buildings, never reaching the surface of the ground, and then lost by evaporation.

Invert
The floor, bottom, or lowest portion of the internal cross-section of a conduit.

Lag Time
The time difference between two occurrences such as between rainfall and runoff or pumping of a well and effect on the stream. *See* Time of Concentration.

Level of Service
A qualitative measure of traffic flow and congestion, representing quality of service. It describes operational conditions within a traffic stream, generally described in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety.

Lining
Impervious material such as concrete, clay, grass, plastic, puddled earth, etc., placed on the sides and bottom of a ditch, channel, and reservoir to prevent or reduce seepage of water through the sides and bottom and/or to prevent erosion.

Lip
A small wall on the downstream end of an apron to break the flow from the apron.

Major Stream
Waterways with a contributing drainage area of one square mile or more.

Manning's Coefficient
The coefficient of roughness used in Manning's Equation for flow in open channels.

Manning's Equation
A uniform flow equation used to relate velocity, hydraulic radius and the energy gradient slope.

Median
The portion of a divided roadway separating the opposing traffic flows. A median may be traversable or non-traversable.

Median Opening
An opening in a non-traversable median that allows accessing or crossing the opposing traffic lanes.

Minimum building elevation
The elevation to which new and substantially improved structures within the floodway or within 200 feet of the floodplain or SFHA are required to be elevated or floodproofed. This elevation would be equal 18 inches above the 100-year water surface elevation based on fully developed conditions or 30 inches above the BFE as indicated in the flood insurance study or, if the BFE is unavailable, 30 inches above the 100-year flood elevation based on current development watershed conditions.

Model
Mathematical systems analysis by computer, applied to evaluate rainfall-runoff relationships; simulate watershed characteristics, predict flood and reservoir routings, or use other aspects of planning.

Nappe
The sheet or curtain of water overflowing a weir or dam. When freely overflowing any given structure, it has a well-defined upper and lower surface.

Open Channel
A conduit in which water flows with a free surface.

Orifice
1. An opening with closed perimeter, and of regular form in a plate, wall, or partition through which water may flow.
2. The end of a small tube, such as a Pilot tube, piezometer, etc.

Peak Flow (Peak Rate of Runoff)
The maximum rate of runoff during a given runoff event.

Percolation
To pass through a permeable substance such as ground water flowing through an aquifer.

Permeability
The property of a material which permits movement of water through it when saturated and actuated by hydrostatic pressure.

Pervious
Applied to a material through which water passes relatively freely.

Pilot Channel
A constructed pathway that guides base streamflow or runoff along a specified route through a drainage facility or drainage feature.

Porosity
1. An index of the void characteristics of a soil or stratum as pertaining to percolation; degree of perviousness.
2. The ratio, usually expressed as a percentage, of (a) the volume of the interstices in a given quantity of material, to (b) the total volume of the material.

Positive Overflow
When the inlets do not function properly, or when the design capacity of the conduit is exceeded, the excess flow must be conveyed overland along a paved course. This could mean along a street or alley but could require a concrete flume and the dedication of special drainage easements on private property.

Post-development
The condition of the given site and drainage area after the anticipated development has taken place.

Precipitation
Any moisture that falls from the atmosphere, including snow, sleet, rain and hail.

Pre-development
The condition of the given site and drainage area prior to development.

Probable Maximum Flood
The flood that may be expected from the most severe combination of critical meteorological and hydrologic conditions that are reasonably possible in the region.

Probable Maximum Precipitation
The critical depth-duration-area rainfall relationship for a given area during the seasons of the year which would result from a storm containing the most critical meteorological conditions considered probable of occurring.

Projected Growth Rate
The estimated growth rate per year for the study area based upon the average growth in the previous 5-year period along arterials in the vicinity of the proposed project.

Proposed Site Traffic Volumes
The number of vehicles per day and per hour projected to be generated by the development.

Rainfall Duration
The length of time over which a single rainfall event occurs.

Rainfall Frequency
The average recurrence interval of rainfall events.

Rainfall Intensity
The rate of accumulation of rainfall, usually in inches or millimeters per hour.

Rational Formula
A traditional method of computing peak flow using intensity of the storm rainfall.

Reach
Any length of river or channel. Usually used to refer to sections which are uniform with respect to discharge, depth, area or slope, or sections between gaging stations.

Recurrence Interval
The average interval of time within which a given event will be equaled or exceeded once. For an annual series (as opposed to a partial duration series) the probability of occurrence in anyone year is the inverse of the recurrence interval. Thus, a flood having a recurrence interval of 100 years has a 1% probability of being equaled or exceeded in any one year.

Regulatory Floodway
The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a

designated height.

Retention
The storage of a portion or all of the storm runoff for purposes of permanent use of the retained water. Retention facilities are similar to detention facilities with the main difference being that all of the storm runoff will not be released to the downstream drainage network.

Return Period
See Recurrence Interval

Reynold's Number (Re)
A flow parameter which is a measure of the viscous effects on the flow. Typically defined as shown in the equation below:

$$Re = (V. D) / \nu \qquad \text{[Eqn. 2.2]}$$

Where:
V = Velocity
D = Depth
ν = kinematic viscosity of the fluid

Riprap (Revetment)
Forms of bank protection, usually using rock or concrete.

Routing
Routing is a technique used to predict the temporal and spatial variations of a flood wave as it traverses a river reach or reservoir. Generally, routing technique may be classified into two categories - hydrologic routing and hydraulic routing.

Right-of-Way
A designated section of a street, sidewalk, alley, waterway or utility easement and/or related facilities, that is dedicated for municipal usage.

Right-of-Way Width
The shortest horizontal distance between the lines which delineate the right-of-way of a street.

Runoff
That part of the precipitation which reaches a stream, drain, sewer, etc., directly or indirectly.
1. Direct Runoff - The total amount of surface runoff and subsurface storm runoff which reaches stream channels.
2. Overland Runoff - Water flowing over the land surface before it reaches a definite stream channel or body of water.

Runoff Coefficient
A decimal number used in the Rational Formula which defines the runoff characteristics of the drainage area under consideration. It may be applied to an entire drainage basin as a composite representation or it may be applied to a small individual area such as one residential lot.

Runoff Total
The total volume of flow from a drainage area for a definite period of time such as a day, month, or a year, or it may be for the duration of a particular storm.

Scour
The erosive action of running water in streams or channels in excavating and carrying away material from the bed and banks.

SCS Runoff Curve Number
Index number used by the National Resource Conservation Service, formerly the Soil Conservation Service, as a measure of the tendency of rainfall to run off into streams rather than evaporate or infiltrate.

Sediment
Material of soil and rock origin transported, carried, or deposited by water.

Sedimentation Basin
A sediment control basin required to catch runoff from common drainage areas with 10 acres or more disturbed at one time during any phase of development that dewaters from the surface unless infeasible.

Sidewalk
A paved area within the street ROW or sidewalk easement specifically designed for pedestrians and/or bicyclists.

Sight Distance
The distance visible to the driver of a passenger vehicle measured along the normal travel path of a roadway from a designated location and to a specified height above the roadway when the view is unobstructed by traffic.

Slope, Critical
The slope or grade of a channel that is exactly equal to the loss of head per foot resulting from flow at a depth that will give uniform flow at critical depth; the minimum slope of a conduit which will produce critical flow.

Slope, Friction
The friction head or loss per unit length of channel or conduit. For uniform flow the friction slope coincides with the energy gradient, but where a distinction is made between energy losses due to bends, expansions, impacts, etc., a distinction must also be made between the friction scope and the energy gradient. The friction slope is equal to the bed or surface slope only for uniform flow in uniform open channels.

Soffit
In a stormwater pipe, the uppermost point of the interior of the pipe wall. The crown is the uppermost point on the outside of the pipe wall.

Spillway
A waterway in or about a dam or other hydraulic structure, for the overflow of excess water.

Standard Details
A collection of uniform detail drawings of structures or devices adopted as standard construction details by the City of Denton.

Steady Flow
Open channel flow is said to be steady if the depth of flow does not change or if it can be assumed to be constant during the time interval of consideration.

Stormwater Facility Maintenance Agreement or Maintenance Agreement
A legal agreement between the City of Denton and a property owner, including HOAs and POAs, for perpetual maintenance of a structural BMP.

Stream
A natural drainageway that conveys stormwater, may also be referred to as a creek. References to a stream or creek in this Manual refer to the entire stormwater carrying component of the stream to the limits of the floodplain, not just to the streambed.

Stilling Basin
Pool of water conventionally used, as part of a drop structure or other structure, to dissipate energy.

Stopping Sight Distance
The distance required by a driver of a vehicle, traveling at a given speed, to bring the vehicle to a stop after an object on the roadway becomes visible. It includes the distance traveled during driver perception time, reaction time, and the vehicle braking distance.

Storage Length
The portion of an auxiliary lane required to store the number of vehicles expected to accumulate in the lane during an average peak period.

Storm Hydrology
The branch of hydrology that concentrates on the calculation of runoff from storm rainfall.

Stormwater Management
The control of storm runoff on-site or on small streams, by means of land use restrictions, detention storage, erosion control, and/or drainage measures.

Stormwater Model
Mathematical representation of a stormwater network.

Study area
The boundaries of the assessment area as determined by the City's Engineer.

Subcritical Flow
The Froude Number is less than 1.0 for subcritical flow conditions.

Supercritical Flow
The Froude Number is greater than 1.0 for supercritical flow conditions.

Tailwater
The depth of flow in the stream directly downstream of a drainage facility.

Time of Concentration
The estimated time in minutes required for runoff to flow from the most remote section of the drainage area to the point at which the flow is to be determined.

Total Head Line (Energy Line)
A line representing the energy in flowing water. The elevation of the energy line is equal to the elevation of the flow line plus the depth plus the velocity head plus the pressure head.

Traffic Queue
Vehicles within a storage queue awaiting traffic movement in a single lane, within one traffic signal cycle.

Trash Rack
Racks, gratings, or mesh designed so as to prevent leaves and rubbish from plugging the outlets from a dam or detention basin.

Trip Distribution
An estimate of the spatial pattern of trips or other flows between given sets of origins and destination pairs. Trip distribution models connect the trip origins and destination, estimated by the trip generation models to create estimated trips based on the Base year and Buildout years (24 hour counts or turning movement counts). Different trip distribution models are developed for each of the trip purposes for which trip generation has been estimated.

Trunk Line
The main line of a storm drain system extending from manhole to manhole or from manhole to outlet structure.

TxDOT Highways
State-operated highways that include Farm to Market (FM) roadways, State Highways (SH), Interstate Highway (IH), IH Frontage Roads, and United States (US) Highways.

Uniform Channel
A channel with a constant cross-section and roughness.

Uniform Flow
Open channel flow is said to be uniform if the depth of flow is the same at every section of the channel.

Unit Hydrograph
The direct runoff hydrograph resulting from one inch of precipitation excess distributed uniformly over a watershed for a specified duration.

Valley Storage
Refers to the water storage capacity of a stream and is a volume that is measured below the base flood elevation. Restrictions on loss of valley storage refer to compensation for the loss of storage caused by fill below the base flood elevation.

Velocity Head
The energy per unit weight of water due to its velocity (v). The velocity head also represents the vertical distance water must fall freely under gravity to reach its velocity (v). The velocity head can be computed from the following equation:

$$\textbf{Velocity Head} = v^2 / 2g \qquad \textbf{[Eqn. 2.3]}$$

Where: v = velocity
g = acceleration due to gravity (32.2 ft/s^2)

Water Year
The water year commonly used in the United States is the period from October 1 to September 30 of the following calendar year.

Watershed
The area contributing storm runoff to a stream or drainage system. Other terms are drainage area, drainage basin and catchment area.

Zone of Influence
A point downstream where the increased discharge from a proposed development results in 0.00' increase in flood elevation.

Section 3: Solid Waste Design Criteria

3.1 Overview

The purpose of Section 3 - Solid Waste Design Criteria of this DCM is to provide basic criteria and standards for the development and maintenance of solid waste and recycling container enclosures.

The Solid Waste Design Criteria established in this Manual shall apply as set forth in:

A. City of Denton Code of Ordinances – Chapter 24,

B. DDC Subchapter 7, Section 7.2 – Applicability, and

C. DDC Subchapter 7, Section 7.12 – Solid Waste and Recycling Design Standards.

The City Code of Ordinances states that the City of Denton shall be the exclusive provider of solid waste collection and disposal services within the City Limits including, but not limited to, services provided for preconstruction activities, construction activities, and residential, multifamily, and commercial activities. All contractors and ~~sub-contractors~~subcontractors should call City of Denton Customer Service (940-349-8700) to initiate service. Third-party solid waste providers may not be used for any on-site solid waste services within the City Limits.

3.2 Design Standards

3.2.1 General

A. Nonresidential on-site solid waste and recycling container enclosures shall be located on each platted lot of non-residential property and shall be constructed and maintained by the property owner or developer and made available for use by the City of Denton Solid Waste Department or commercial recycling service provider.

B. Nonresidential on-site solid waste and recycling container enclosures shall be available for the storage of all municipal solid waste and recyclables generated for each platted property. The City reserves the ability to determine whether any parcel or area (For example, Downtown Square, strip centers, multifamily residential, etc.) must have shared container service or an alternative service. Container enclosures shall be of adequate size to contain all solid wastes, liquid wastes, and recyclables generated on the property, including, but not limited to, municipal solid waste, recyclables, grease and oils, process by-products and wastes, hazardous waste, medical waste, and any special wastes, contained in accordance with Chapter 24, City of Denton Code of Ordinances.

C. The container enclosures shall meet the Container Enclosure and Storage Space Dimensional Requirements prescribed in Section 3.2.2 of this Manual, as well as Chapter 469 of the Texas Government Code, as amended.

D. New nonresidential uses of 999 square feet ("sq. ft.") or less will be evaluated by City staff to determine the applicability of constructing an enclosure. Trash and recycling carts may be appropriate, thereby eliminating the need for the construction of an enclosure.

E. Cart storage may be utilized on property converted from a residential to non-residential use if the converted property is a structure of less than 2,500 gross sq. ft., has a waste generation rate applicable for cart service, and is in an area where commercial cart service is available.

F. Proposed future building expansion (evaluated at 50% or more of the current square footage) and

phased development shall be considered in ~~–~~site design with regard~~s~~ to sizing, location(s), and access of future solid waste and recyclables container enclosures. Solid waste and recycling areas necessary for future building expansion shall be available~~–~~, but need not be utilized, nor container enclosures constructed, until future building expansion occurs.

G. Containers for solid waste and recycling service shall be screened from the public right-of-way ("ROW") ~~–~~and from adjacent property owners.

H. Proper construction of the container enclosures shall be completed prior to final approval of the development or property by the City's Solid Waste Department.

I. Container enclosure designs shall be consistent with the engineering drawings and specifications shown in the Solid Waste and Recycling Container Enclosure Construction Drawings in the City of Denton Standard Details.

3.2.2 Container Enclosure and Storage Space Dimensional Requirements

A. All single front-load commercial container enclosures shall have inside walls with dimensions measuring a ~~–~~minimum of 13 feet wide and 11.5 feet deep. The Rear face of the bollard must be three (3) feet from the rear of the enclosure and the front of the bollard must be eight (8) feet from the front of the enclosure, leaving six (6) inches of space equal to the size of the bollard. Only solid waste and recycling containers are allowed in the enclosures. Other storage containers such as grease and oil receptacles, and other items shall be stored and located in a different enclosure. These enclosures shall be located where they will not impede the service of the solid waste and/or recycling containers.

B. All dual front-load commercial container enclosures shall ~~–~~have inside walls with dimensions measuring 26 feet wide and 11.5 feet deep. The Rear face of the bollard must be three (3) feet from the rear of the enclosure and the front of the bollard must be eight (8) feet from the front of the enclosure, leaving six (6) inches of space equal to the size of the bollard. Only solid waste and recycling containers are allowed in the enclosures. Other storage containers such as grease and oil receptacles, and other items shall be stored and located in a different enclosure. These enclosures shall be located where they will not impede the service of the solid waste and/or recycling containers.

C. ~~For extreme~~extreme cases and with department director aproval~~approval~~In the rare case where it is not possible to fit typical front-load enclosures as required above, a design deviation request may be submitted to the City's Solid Waste Department for the consideration of the following two alternatives: ~~citations 1. and 2. are available for consideration. These two options are not included in Table 3.2can be considered.~~

1. ~~A~~All ~~s~~ingle side-load commercial container enclosures ~~shall have~~having inside walls with dimensions measuring a minimum of 10 feet wide and eight (8) feet deep. The Rear face of the bollard must be one (1) foot from the rear of the enclosure, and the front of the bollard must be ~~6 feet 6 inches~~6.5 feet from the front of the enclosure, leaving six (6) inches of space equal to the size of the bollard. Only solid waste and recycling containers are allowed in the enclosures.

~~D~~All ~~d~~ual side-~~–~~load commercial container enclosures ~~shall have~~having inside walls with dimensions measuring 20 feet wide and eight (8) feet deep. The Rear face of the bollard must be one (1) foot from the rear of the enclosure, and the front of the bollard must be ~~6 feet, 6 inches~~6.5 feet from the front of the enclosure, leaving six (6) inches of space equal to the size

of the bollard. Only solid waste and recycling containers are allowed in the enclosures.

~~1.~~2.

~~B.~~D. All roll-off compactor enclosures shall have~~—~~ inside walls with dimensions ~~-~~measuring a minimum of 16 feet wide. The depth of the inside walls must accommodate the compactor size selected.

~~C.~~E. The City of Denton Standard Details contain the required construction specifications for container enclosures and storage spaces.

~~D.~~F. All developments shall be required to install container enclosures as specified in Table 3.2-A~~Table 3.2-A~~ .

~~E.~~G. Nonresidential uses ~~which~~ that are not required to meet the above storage space and enclosure requirements, will be reviewed for adequate solid waste and recyclables enclosures based on site-specific information and the following Solid Waste and Recycling Design Factors:

1. Type of business;
2. Waste generation potential;
3. Waste generation of similar businesses;
4. Square footage of the development and structures;
5. Number of floors;
6. Location of the business;
7. Hours of business operation;
8. Business site plan; and
9. Phased development and future use plans.

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Table 3.2-A: Minimum Container Enclosure Requirements

Development Use	Required Enclosure(s) or Container(s)
RESIDENTIAL	
Single-family	Residential curbside cart pick-up
Townhomes – 4 units or~~and~~ fewer	
RESIDENTIAL - MULTIFAMILY	
5 – 48 units	2 front-load containers enclosed
49 – 64 units	3 front-load containers enclosed
65 – 200 units	1 compactor and 1 front-load container for recycling or 4 front-load containers enclosed
200+ units	1 compactor and 1 front-load container~~s~~ enclosed
GENERAL COMMERCIAL	
1 – 15,000 sq. ft.	2 front-load containers enclosed
15,001 – 50,000 sq. ft.	3 front-load containers enclosed
50,001 – 200,000 sq. ft.	1 compactor and 1 front-load container for recycling or 4 front-load containers enclosed

Over 200,000 sq. ft.	1 compactor and 1 front-load container enclosed

Notes:
[1] For industrial/warehouse development, container(s) do not require enclosures, but container(s) must be screened from public view.

3.2.3 Container Enclosure Design Requirements

A. Materials used for container enclosure construction shall be compatible with the architecture and appearance of the main building and may include the following materials:
   1. Concrete Block – Tinted, colored, painted, or with textured facing;
   2. Concrete – Poured or tilt wall construction;
   3. Brick - Double brick thickness minimum;
   4. Stone;
   5. Metal;
   6. Wood;
   7. Vinyl;
   8. Composite Material; or
   9. Any combination of materials 1-8.

B. Front-load and side-load commercial enclosures shall have walls constructed to a minimum height of six (6) feet, or as tall as required to conceal the container. Compactor enclosure walls must be a minimum height of eight (8) feet, in order to conceal the compactor and mechanical equipment.

C. Gates shall be required when the interior of the enclosure is visible from the public ROW or when it is visible from the lot of an adjacent property owner.

D. Personal access side gates are recommended as a feature of all gated enclosures. These gates should be fitted with emergency egress strike bars.

3.2.4 Enclosure Access, Placement, Ingress, and Egress Requirements

A. The required number of enclosures will be determined based on the type and size of the development.

B. Dumpster enclosures must be angled no more than 30 degrees from the center line of the solid waste collection vehicle route.

C. There must be 50 feet or more of unobstructed truck access in front of each container.

D. For safety purposes, solid waste collection vehicles will not back up more than 100 feet after servicing a container and will not make any turns while backing up.

E. Turn Radii Requirements: The turn radii must be a minimum of 30 feet for any intersection to accommodate occasional turning trucks for weekly pick-up.

F. The collection vehicle will travel through a site once without backtracking. For an example of a typical solid waste collection route, take note of the Typical Solid Waste Collection Route Schematic shown in Figure 3.1 below.

G. Container enclosures shall not be located in ~~a fire lane~~fire apparatus access roads, public ROW,

public utility easements, or sidewalk area.

H. No solid waste container enclosure shall be located within the required front yard or protrude in front of any buildings along the designated lot frontage.

I. Parking spaces shall begin after the enclosure gates open. No obstructions permitted around enclosure or gate openings equivalent to the length of the gate.

J. The location of container enclosures may not cause the obstruction of traffic for excessive lengths of time while being serviced.

K. The solid waste service truck shall be on the property owner's property during service operations, if the site design permits.

L. Ingress and egress routes shall be designed to facilitate exiting the property in a forward driving direction for all interstate and state roads, arterial streets, and collector streets with four lanes. *See* the Backing Clearance Schematic in Figure 3.2 below.

M. Utility wires and structure overhangs should have a minimum height clearance of 20 feet along the ingress and egress route. No utility wires shall extend over the enclosure approach and service area.

N. Container enclosures shall be located a minimum of 30 feet away from any storm drain or drainage flow areas. Where site configuration allows, container enclosures shall also be placed downslope of any storm drain.

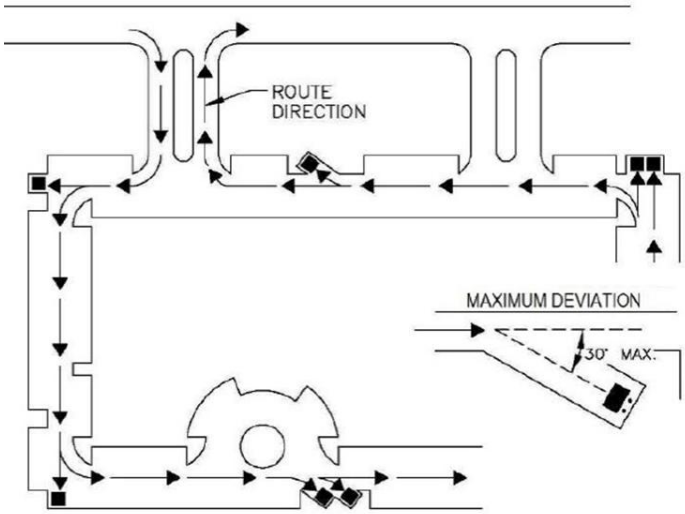

Figure 3.1 Typical Solid Waste Collection Route Schematic

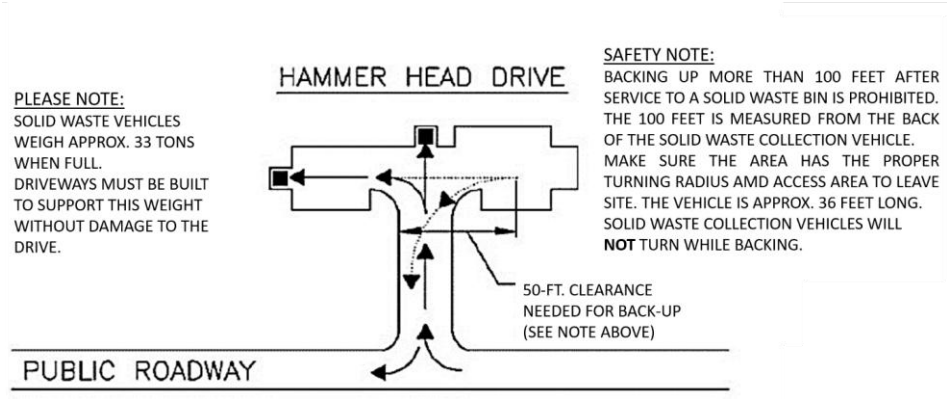

Figure 3.2 Backing Clearance Schematic

3.2.5 Alleyway Access

An alley (residential or commercial) is a private street designed to provide fire and solid waste collection access to the rear ~~of~~ or side of a lot. Dead_-ends are not permitted in alleys. Alleys used for solid waste collection must comply with the Transportation Design Criteria~~Transportation Design Criteria~~ in Section 5 of this Manual. Alleyway access must comply with the following criteria:

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A. Design Factors:
   1. Turn Radius;
   2. Street Widths;
   3. Horizontal and Vertical Clearances;
   4. Pavement; and
   5. Multifamily Units

B. Turn Radii Requirements: Texas Department of Transportation (TxDOT) recommends, via AASHTO, that the turn radii be a minimum of 30 feet for alley-to-alley intersections with occasional turning trucks for weekly trash pick-up per TCEQ regulations. Turn radii must be sufficient for side-load residential collection vehicles to navigate alleyways lined with trash and recycle carts on both sides. *See* Figure 3.3 below.

C. Alley Width Requirements: Alleys must be paved and a minimum of 15-ft. wide. Additionally, alleys must be wide enough to accommodate carts, to allow vehicles to safely service carts, and to comply with the Transportation Design Criteria in Section 5 of this Manual.

D. Horizontal and Vertical Clearance Requirements: Balconies, landscaping, or other elements shall not encroach into approved horizontal or vertical clearances for vehicle travel, backing, loading, or other operations along any alley.

1. The horizontal operating travel clearance must be 20 feet.
2. The vertical operating travel clearance must be 15 feet.

E. Pavement Requirements: Pavement must be built to standards that allow two (2) 33-ton vehicles to travel down all alleys twice each service day. Alternatively, a responsible party, HOA, or POA must provide a waiver recorded with the property for potential damage caused over time by normal hauler operations.

F. Multifamily Unit Requirements: Any attached residential arrangement of five (5) or more dwelling units per lot will fall under the Commercial Business Category as defined by City of Denton Code of Ordinances 24-2 Definitions (Commercial), which requires a solid waste and recycling storage facility (container enclosure). *See* the Site Plan Criteria for Municipal Solid Waste & Recyclables Storage & Enclosure Requirements in the City of Denton Standard Details.

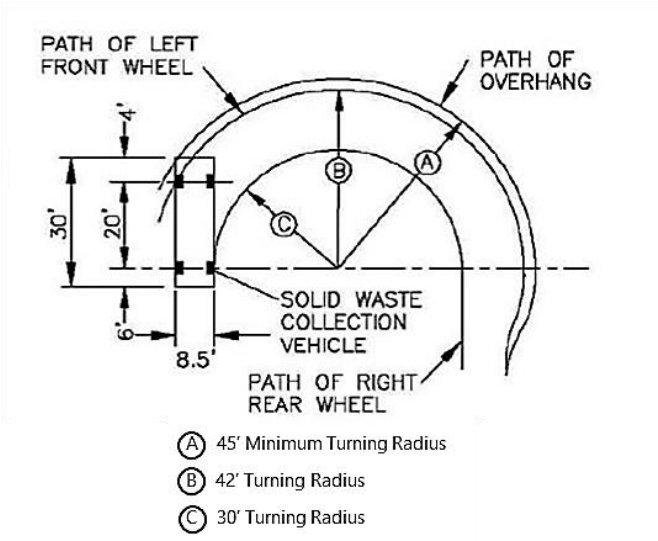

Figure 3.3 Solid Waste Collection Vehicle Turn Radius Schematic

Section 4: Stormwater Design Criteria

4.1 Overview

The purpose of Section 4 - Stormwater Design Criteria of this DCM is to establish standard principles and practices for the design and construction of storm drainage systems, to implement the policies set forth in the DDC and the City of Denton Code of Ordinances, Subpart B, Chapter 30 (Denton Flood Prevention and Protection Ordinance) within the City of Denton, Texas and its extraterritorial jurisdictions.

The following documents govern the design and construction of stormwater drainage systems:

A. City of Denton Code of Ordinances, Chapter 30, Flood Prevention and Protection;
B. DDC Subchapter 7.4 – Environmentally Sensitive Areas;
C. DDC Subchapter 7.5 – Drainage Standards;
D. *i*SWM™ Planning Technical Manual Document;
E. *i*SWM™ Water Quality Technical Manual Document;
F. *i*SWM™ Hydrology Technical Manual Document;
G. *i*swm™ Hydraulics Technical Manual Document;
H. *i*SWM™ Site Development Controls Technical Manual Document;
I. *i*SWM™ Construction Controls Technical Manual Document;
J. *i*SWM™ Construction Control Standard Details Technical Manual Document; and
K. *i*SWM™ Landscape Technical Manual Document.

The design factors, formulae, graphs, and procedures specified in this document are intended for use as minimum engineering criteria for the design of drainage systems with regards to the quantity, rate of flow, method of collection, storage, conveyance, detention, and disposal of storm water***. Responsibility for actual design remains with the design engineer. Users of this Manual should be knowledgeable and experienced in the theory and application of drainage engineering.***

The stormwater criteria contained in this Manual supersede any design criteria contained in the *i*SWM™ Planning, Water Quality, Hydraulics, and Hydrology Technical Manual Documents. The stormwater design criteria contained in this Manual ***do not*** supersede the criteria contained in the DDC or Chapter 30 of the City of Denton Code of Ordinances. Any revisions to the DDC or Chapter 30 of the City of Denton Code of Ordinances shall supersede the criteria in this Manual. In case of any conflict, the more stringent requirement shall apply.

The requirements of this Manual shall apply to all public facilities and to private facilities when the performance of such private facility has an effect on the public interest, health, or welfare.

4.1.0 Organization

Section 4 - Stormwater Design Criteria is categorized as follows:

A. Overview~~Overview~~
B. Design Focus~~Design Focus~~

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C. Design Storms~~Design Storms~~
D. Hydrologic Methods~~Hydrologic Methods~~
E. Acceptable Downstream Conditions for Open Channels and Floodplains~~Acceptable Downstream Conditions for Open Channels and Floodplains~~
F. Stormwater System Design~~Stormwater System Design~~
G. Culverts~~Culverts~~
H. Bridges~~Bridges~~
I. Detention Facilities~~Detention Facilities~~
J. Energy Dissipation~~Energy Dissipation~~
K. Floodplain~~Floodplain~~
L. Drainage and Floodplain Easements~~Drainage and Floodplain Easements~~
M. Water Quality~~Water Quality~~
N. Stormwater Facility Maintenance Agreements~~Stormwater Facility Maintenance Agreements~~

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4.2 Design Focus

The design criteria for stormwater management primarily focus on:

4.2.1 Streambank Protection - Regulate discharge from the site to minimize downstream bank and channel erosion;

4.2.2 Flood Mitigation and Conveyance - Control runoff within and from the site to minimize flood risk to people and properties for the conveyance storm and the 1% chance storm; and

4.2.3 Water Quality - Reduce pollutants from stormwater by either infiltrating the water quality volume, or removing 80% of total suspended solids (TSS) from any "*Water Quality*" storm event discharge.

4.3 Design Storms

Design is typically based on four (4) storm events, as detailed in Table 4.3-A.

Table 4.3-A: Design Storm Events

Storm Event Name	Storm Event Description
"Water Quality"	Criteria based on a volume of 1.5 inches of rainfall, not storm frequency
"Streambank Protection"	1-year, 24-hour storm event
"Conveyance"	25-year, 24-hour storm event
"Flood Mitigation"	100-year, 24-hour storm event

Notes:
[1] Throughout the manual, the storms will be referred to by their storm event names.

Drainage facilities shall be designed utilizing the "*Flood Mitigation*" storm event. Replacement or modification of existing drainage facilities shall not reduce capacity, but such facility replacements or modifications may be designed according to the requirements of the specific project and may utilize the "*Conveyance*" storm as the design storm event, through an approved design deviation request.

4.4 Hydrologic Methods

4.4.1 Types of Hydrologic Methods

The following empirical hydrologic methods support hydrologic site analysis for the design methods and procedures included in this Manual:

A. Rational Method;

B. SCS Unit Hydrograph Method;

C. Modified Rational Method;

D. Snyder's Unit Hydrograph Method; and

E. USGS & TxDOT Regression Equations

Table 4.4-A lists the hydrologic methods and the circumstances when they may be used in various analysis and design applications. Table 4.4-B provides some additional constraints on the use of several methods.

Table 4.4-A: Applications of the Hydrologic Methods

Method	Rational Method	SCS Method	Modified Rational	Snyder's Unit Hydrograph Method	USGS & TxDOT Equations
Streambank Protection Volume (SP_V)		✓		✓	
Flood Mitigation Discharge (Q_f)		✓		✓	✓
Storage Facilities		✓	✓	✓	
Outlet Structures		✓		✓	
Gutter Flow and Inlets	✓	✓			
Storm Drain Pipes	✓	✓		✓	
Culverts	✓	✓		✓	✓
Bridges		✓		✓	
Small Ditches	✓	✓		✓	
Open Channels	✓	✓		✓	✓

Table 4.4-B: Constraints on Using Hydrologic Methods

Method	Size Limitations [1]	Used for Estimating
Rational [2]	0 – 100 acres	Peak flows and design of small site or subdivision storm sewer systems.
Modified Rational [3]	0 – 200 acres	Runoff volumes for storage design.
Unit Hydrograph (SCS) [4]	Any Size	Peak flows and hydrographs for all design applications.
Unit Hydrograph (Snyder's) [5]	1 acre and larger	Peak flows and hydrographs for all design applications.
TxDOT Regression Equations [6]	10 – 100 sq. mi.	Peak flows for rural design applications.
USGS Regression Equations [6]	3 – 40 sq. mi.	Peak flows for urban design applications.

Notes:
[1] Size limitation refers to the drainage basin for the stormwater management facility (e.g., culvert, inlet).
[2] Acceptable for small, highly impervious drainage areas, such as parking lots and roadways draining into inlets and gutters.
[3] Used for conceptualizing; the engineer of record must use *i*SWM™ Hydrology Technical Manual Document when using this method.
[4] Refers to SCS routing methodology included in many readily-available programs (such as HEC-HMS or HEC-1) which utilize it.
[5] Refers to Snyder's methodology included in many readily-available programs (such as HEC-HMS or HEC-1) which utilize it.
[6] The USGS and TxDOT equations should not be used when there are significant storage areas within the drainage basin or where other drainage characteristics indicate general regression equations are not appropriate.

4.4.2 Rainfall Estimation

Rainfall intensities, provided in Table 5.3 of the iSWM™ Hydrology Technical Manual, are based on Atlas 14 and shall be used for all hydrologic analysis within Denton County.

4.5 Acceptable Downstream Conditions for Open Channels and Floodplains

Storm water discharge from a development shall not cause adverse impacts to adjacent, upstream, or downstream properties or facilities. The design of a storm drain facility must account for the offsite flows that are routed through the development, flows generated by the development, and the impacts of the development and the drainage system on downstream facilities.

4.5.1 Downstream Assessments

The downstream impacts of development must be carefully evaluated for the two (2) focus areas of Streambank Protection and Flood Mitigation (*See* Section 4.2 of this Manual). The purpose of the downstream assessment is to protect downstream properties from increased flooding and downstream channels from increased erosion potential due to upstream development. The importance of the downstream assessment is particularly evident for larger sites or developments that have the potential to dramatically impact downstream areas. The cumulative effect of smaller sites, however, can be just as dramatic and, as such, following the Focus Areas is just as important for the smaller sites as it is for the larger sites.

A downstream assessment will be required for all developments which alter flow patterns or increase the amount of impervious surface and do not limit the peak discharge to pre-development conditions at each outfall from their site. The assessment shall extend from the outfall of a proposed development to a point downstream where there is no calculated increase in WSEL (water surface elevation) or mean velocity within the receiving stream or storm drainage system. The City shall be consulted to obtain records and maps related to the National Flood Insurance Program (NFIP) and the availability of Flood Insurance Studies (FIS)

and Flood Insurance Rate Maps (FIRMs) which will be helpful in this assessment. The assessment must include the following properties:

A. Hydrologic analysis of the pre- and post-development on-site conditions.
B. Drainage path that defines extent of the analysis.
C. Capacity analysis of all existing constraint points along the drainage path, such as existing floodplain developments, underground storm drainage systems culverts, bridges, tributary confluences, or channels.
D. Offsite undeveloped areas are considered as "fully developed" for both the pre- and post-development analyses.
E. Evaluation of peak discharges and velocities for three (3) 24-hour storm events:
    1. "*Streambank protection*" storm
    2. "*Conveyance*" storm
    3. "*Flood Mitigation*" storm
F. Separate analysis for each major outfall from the proposed development.

Once the analysis is complete, the designer must answer the following questions at each determined junction downstream:

A. Are the post-development discharges greater than the pre-development discharges?
B. Are the post-development velocities greater than the pre-development velocities?
C. Are the post-development velocities greater than the velocities allowed for the receiving system?
D. Are there any increases in post-development flood heights above the pre-development flood heights?

These questions shall be answered for each of the three (3) storm events. The answers to these questions will determine the necessity, type, and size of non-structural and structural controls to be placed on-site or downstream of the proposed development.

Section 2.0 of the iSWM™ Hydrology Technical Manual, as amended, gives additional guidance on calculating the discharges and velocities, as well as determining the downstream extent of the assessment.

4.5.2 Adverse Impacts

Downstream Assessments shall evaluate the capacity of the downstream system within the Zone of Influence (ZOI). If the downstream system has less than fully developed capacity, the study shall demonstrate the development will produce no adverse impacts during the one (1), 25, and 100-year storm events. No adverse impacts may include, but are not limited to:

A. No new or increased flooding of existing structures;

B. Zero increases (0.00') in water surface elevations unless contained within the banks of an existing channel including 1-ft. freeboard. Dry lane requirements set forth in Section 4.6.2 shall also be met;

C. Increasing channel velocity is prohibited where existing velocities are erosive. Any increase in channel velocity in other areas must remain below the maximum allowable velocity as defined in Table 4.6-ETable 4.6-E;

D. No increases in downstream discharges caused by the proposed development that, in combination with off-site discharges, exceeds the existing capacity of the downstream storm drainage system;

E. The *Downstream Assessment* shall extend to a point downstream, known as the ZOI, where the proposed development creates no adverse impacts. The ZOI will be defined by a detailed hydrologic and hydraulic modeling analysis. The City's Engineer may require analysis beyond the ZOI

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established by the Engineer of Record based on the criteria above and known flooding issues. ZOI does not automatically end based the rule of thumb known as the "10% rule"; and

F. If the subject development is part of a larger development, the *Downstream Assessment* must include the larger development, and the ZOI shall be determined based on the entire property.

4.5.3 Stormwater Diversions

Diversion of storm water away from the natural watercourse or existing discharge points will not be allowed, except within the property boundaries controlled by the developer under the following conditions:

A. The storm water is returned to its natural flowing watercourse prior to leaving the developer's property, or

B. A timing analysis of the existing and diverted hydrograph must be performed to confirm that the peak flow rate has not been increased at the point that it reenters the watercourse, as a result of the diversion. The City's Engineer may require additional downstream analysis if there are known downstream flooding or volume-sensitive areas.

4.5.4 Streambank Protection

There are two (2) options by which a developer can provide adequate streambank protection downstream of a proposed development. The first step is to perform the required downstream assessment as described earlier in Section 4.5.1 of this Manual. If it is determined that the proposed project does not exceed acceptable downstream velocities or the downstream conditions are improved to adequately handle the increased velocity, then no additional streambank protection is required. If the downstream assessment shows that the velocities are within acceptable limits, then no streambank protection is required. Acceptable limits for velocity control are provided in Table 4.6-D~~Table 4.6-D~~ and Table 4.6-E~~Table 4.6-E~~ of this Manual. If existing stream velocities exceed the maximum allowable velocities, then no increase in velocities will be permitted. If the downstream assessment shows an increase in velocity beyond the acceptable limits, then on-site or downstream improvements are required for streambank protection, easements or right-of-entry agreements will need to be obtained in accordance with Section 4.12 of this Manual, and one of the two options below must be utilized for streambank protection.

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Option 1: Reinforce/Stabilize Downstream Conditions

If the increased velocities are greater than the allowable velocity of the downstream receiving system, then the developer must reinforce/stabilize the downstream conveyance system. The proposed modifications must be designed so that the downstream system is protected from the post-development velocities. The developer must provide supporting calculations and/or documentation that the downstream velocities do not exceed the allowable range once the downstream modifications are installed.

Allowable bank protection methods include stone riprap, gabions, and bio-engineered methods. Sections 3.2 and 4.0 of the *i*SWM™ Hydraulics Technical Manual give design guidance for designing stone riprap for open channels, culvert outfall protection, riprap aprons for erosion protection at outfalls, and riprap basins for energy dissipation.

If the downstream receiving system is designated as an Environmentally Sensitive Area (ESA) this option may not be a viable option. *See* Section 7.4 of the DDC for more information about the various types of ESAs, permitted encroachments, and processes for assessing and modifying ESAs.

Option 2: Install Stormwater Controls to Maintain Existing Downstream Conditions

The developer must use on-site controls to keep downstream post-development discharges at or below

allowable velocity limits. The developer must provide supporting calculations and/or documentation that the on-site controls will be designed such that downstream velocities for the three (3) storm events ("*Streambank Protection*", "*Conveyance*", and "*Flood Mitigation*") are within an allowable range once the controls are installed.

4.5.5 Flood Mitigation

A. Introduction

Flood analysis is based on the "*Flood Mitigation*" storm event (see Table 4.3-ATable 4.3-A). The intent of the flood mitigation criteria is to provide for public safety; minimize on-site and downstream flood impacts from the "*Flood Mitigation*" storm event; maintain the boundaries of the mapped 100-year floodplain; and protect the physical integrity of the on-site stormwater controls and the downstream stormwater and flood mitigation facilities.

Flood mitigation must be provided for on-site conveyance systems, as well as downstream outfalls as described in the following sections.

B. Flood Mitigation Design Options

There are three (3) options by which a developer may address downstream flood mitigation as discussed below. When on-site or downstream modifications are required for downstream flood mitigation, easements or right-of-entry agreements will need to be obtained.

The developer will provide all supporting calculations and/or documentation to show that the existing downstream conveyance system has capacity (Q_f) to safely pass the fully-developed flood mitigation storm discharge.

Option 1: Provide or Document Adequate Downstream Conveyance Systems

When the downstream receiving system does not have adequate capacity, then the developer shall provide modifications to the off-site, downstream conveyance system. If this option is chosen, the proposed modifications must be designed to adequately convey the full build-out stormwater peak discharges for the "*Flood Mitigation*" storm event. The modifications must also extend to the point at which the discharge from the proposed development no longer has an impact on the receiving stream or storm drainage system.

The developer must provide supporting calculations and/or documentation that the downstream peak discharges are safely conveyed by the proposed system, without endangering downstream properties, structures, bridges, roadways, or other facilities, and no increase in water surface elevation.

Option 2: Install Stormwater Controls to Maintain Existing Downstream Conditions

When the downstream receiving system does not have adequate capacity, then the developer shall provide stormwater controls to reduce downstream flood impacts. These controls include on-site controls such as detention, regional controls, and, as a last resort, local flood protection such as levees, floodwalls, floodproofing, etc.

The developer must provide supporting calculations and/or documentation for each existing discharge point indicating that the controls will be designed and constructed so that there is no increase in downstream peak discharges or water surface elevations due to development.

Option 3: In lieu of a Downstream Assessment, Maintain Existing On-Site Runoff Conditions

Lastly with Option 3, on-site controls shall be used to maintain the pre-development peak discharges for each existing discharge point from the site. The developer must provide

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supporting calculations and/or documentation that the on-site controls will be designed and constructed to maintain on-site existing conditions.

It is important to note that Option 3 may not require a downstream assessment. It is a detention-based approach to addressing downstream flood mitigation after the application of the integrated site design practices. However, a downstream assessment may be required for sites adjacent to or near streams in which delayed release of flows from detention facilities could potentially increase the peak flow in the stream due to coincident peaks. This assessment of the impact of coincident peaks is required for all sites with a contributing drainage area greater than or equal to 10% of the stream drainage area at the subject discharge point.

4.6 Stormwater System Design

4.6.1 Introduction

Stormwater system design is an integral component of both site and overall stormwater management design. Good drainage design must strive to maintain compatibility and minimize interference with existing drainage patterns; control flooding of property, structures, and roadways for design flood events; and minimize the potential environmental impacts of stormwater runoff.

Stormwater collection systems must be designed to provide adequate surface drainage while at the same time meeting other stormwater management goals such as water quality, streambank protection, habitat protection, and flood mitigation. Fully developed watershed conditions shall be used for determining runoff for the *"Flood Mitigation"* storm event.

4.6.2 Hydraulic Design Criteria for Streets and Closed Conduits

A. Introduction

This section is intended to provide criteria and guidance for the design of on-site flood mitigation system components including:

1. Street and roadway gutters;
2. Stormwater inlets;
3. Storm drainpipe systems; and
4. Parking lot sheet flow.

B. Streets and ROW

1. Design Criteria
   a. Flow spread limits for curbed streets are shown in Table 4.6-A below.
   b. Inverted crown sections are permitted only in alleys.
   c. Street crowns shall be reduced for approximately 100 feet on each side of the valley gutters. No valley gutters will be permitted across collectors or arterials.
   d. For non-curbed streets the "*Flood Mitigation*" storm event shall be contained within paralleling roadside ditches, within the public ROW (Figure 4. 1 below).
   e. Roadside ditches shall be designed to carry the "*Flood Mitigation*" runoff below the roadway elevation.

f. Streets or alleys adjacent to an open channel shall have the edge of the pavement designed with a minimum elevation of one (1) foot above the "*Flood Mitigation*" elevation or as directed by the City's Engineer.

g. Where additional hydraulic capacity is required on the street, the proposed street gradient must be increased, or curb inlets and storm sewers installed to remove a portion of the flow.

h. The maximum concentrated flow directed into the street (from a driveway or flume, etc.) is three (3) cubic feet per second (cfs).

2. Flow Spread Limits

a. Inlets shall be spaced so that the spread of flow in the street for the *"Flood Mitigation"* storm shall not exceed the guidelines listed below in Table 4.6-A, as measured from the gutter or face of the curb:

Table 4.6-A: Flow Spread Limits

Street Classification	Allowable Encroachment
Collectors	one travel lane remains open
Arterials	one travel lane in each direction remains open
Residential Streets	curb depth

b. The allowable drainage flow across street intersections for the *"Flood Mitigation"* storm event shall be as shown in Table 4.6-B as follows:

Table 4.6-B: Permissible Flow Across Street Intersections

Street Classification	Cross-Flow
Arterial Street (divided and undivided)	None
Non-Residential Collector Street	None
Residential Street and Residential Collector	Gutter Flow of 2 inches or less

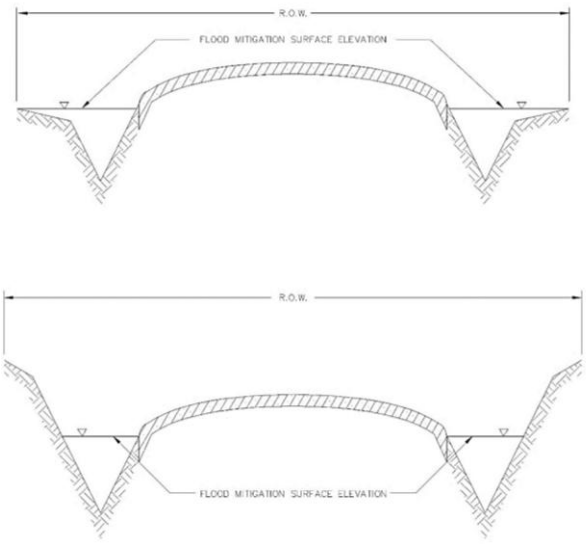

Figure 4.1 Water Spread Limits for Non-Curbed Roadways

3. Minimum Street or Alley Elevations

   No lowering of the standard height of street crown shall be allowed for the purposes of obtaining additional hydraulic capacity. Street crowns shall be in accordance with the City of Denton Standard Details.

C. Drainage Related Minimum Elevations

1. For lots in the influence of a sag area and a positive overflow, the finished floor elevation (FFE) will be at least one (1) foot above the sag area top of the curb, or one (1) foot above the possible maximum pool elevation when the positive overflow is functioning, whichever elevation is higher.
2. New and substantially improved structures within the floodplain or within 200 feet of the floodplain or SFHA must have their finished floor elevated to the minimum building elevation as defined in the City's Chapter 30 Flood Prevention and Protection Ordinance.
3. In all other areas, the minimum FFE shall be a minimum of one (1) foot above the street curb, edge of alley, or rear property line (at the midpoint of the lot), whichever is lower.

D. Storm Inlet Design

1. Permissible Types of Inlet
   a. Drop Inlets (Y-inlet) – Drop inlets are sump inlets which are not located along the curb line of a roadway.
   b. Grate Inlets – The use of grate inlets is not allowed on public drainage systems unless through an approved design deviation request. If allowed, the inlet opening shall be designed twice as large as the calculated opening to compensate for clogging. Grate

inlets may be used on private systems.

c. Curb Inlets – Curb inlets may be located at roadway low points (sumps) or on grade at such points as to meet the water spread limitations and cross-flow depth requirements. Curb inlets may be one of the following:

i. Recessed curb inlet – Recessed curb inlets are curb inlets constructed such that the front of the inlet is two (2) feet behind the normal face of curb and the depression does not extend into the traffic lanes.

ii. Standard curb inlet – Standard curb inlets are curb inlets that are in line with the roadway curb.

iii. Type 2 curb inlet – Type 2 curb inlets are standard curb inlets where the inlet box is located underneath the outer roadway lane instead of behind the curb. They are only to be utilized in situations where there is insufficient parkway area or an encumbered parkway area for a standard curb inlet.

2. Design Criteria

a. Public curb inlet size shall be 10, 15, or 20 feet. Maximum length of inlet at any one (1) curb location shall be 20 feet on each side of the street. Inlets will be placed only in straight sections of curb and at least ~~10~~ 5 feet from any curb return. Inlets required in cul-de-sacs are the only exceptions to the straight curb section requirement. Curb inlets are not allowed in intersection or curb returns.

b. Recessed inlets will be required on arterial and non-residential collector streets.

c. The maximum inlet opening shall be six (6) inches. Openings larger than six (6) inches shall require approval through a design deviation request and shall contain a bar or other form of restraint.

d. Inlets shall be located in the following locations:

i. At low points;

ii. Upstream of pavement crown transitions at intersections (or the developer may identify flow patterns and depths to show these inlets are not needed); and

iii. Where street flow spread limits or permissible intersection depths are exceeded.

e. Where possible, inlets at intersections shall be located on the street with the lesser classification or on alleys.

f. A bypass of no more than ~~5~~10% of the inlet capacity will be allowed for the *"Flood Mitigation"* storm event.

g. To prevent water flowing across the street for the "*Flood Mitigation*" storm event, water flowing in gutters of arterials should be picked up prior to reaching super-elevated sections.

h. In super-elevated sections of divided arterials, inlets placed against the center medians shall have no gutter depressions. Interior gutter flow (flow along the median) shall be intercepted at the point of superelevation transition to prevent street cross-flow.

i. At bridges with curbed approaches, water should be intercepted before flowing onto the bridge to prevent icing during cold weather.

j. New inlets shall not be constructed within a sidewalk o~~r~~ other pedestrian path.

k. The use of recessed inlets shall only be allowed where they do not adversely impact the access or functionality of existing utility facilities.

l. Design and location of inlets shall take into consideration pedestrian and bicycle traffic.

m. The use of slotted drains is discouraged except in instances where there is no alternative. Any use of slotted drains requires approval through a design deviation request. If used, the manufacturer's design guidelines should be followed.

n. Depressed inlets are recommended on continuous grades that exceed 1%, although their use in traffic lanes should be avoided whenever possible.

o. A redundant, flanking inlet is required wherever a sag point or low point inlet is ~~identified~~identified, and no positive overflow path is provided. The redundant inlet shall have the same size as the sag or low point inlet but will not be considered in the hydraulic capacity calculations. The redundant inlet shall have a maximum inlet elevation of six (6) inches above the sag or low point inlet elevation to ensure ponding does not overtop the curb.

3. Inlet Computations

a. Sump Inlets and Drop Inlets

Curb inlets and drop inlets in a sump or low point can be considered to function as a rectangular broad-crested weir with a coefficient of discharge of 3.06. The capacity shall be based on the following weir equation:

$$\mathbf{Q / L \text{ or } Q / P = 3.06\ H^{3/2}} \qquad \textbf{[Eqn. 4.1]}$$

Where:
Q = Capacity of curb opening inlet or capacity of drop inlet (*cfs*)
H = Head at the inlet (*feet*)
L = Length of curb opening inlet (*feet*); or
P = Length of portion of perimeter of inlet opening, through which water enters the drop inlet (*feet*)

Inlets should be located such that the inlet openings do not become submerged. In some cases where this is not possible and the inlet operates under completely submerged conditions, the orifice equation [Eqn. 4.2] should be used to compute the inlet capacity, rather than the weir formula [Eqn. 4.1]. The capacity of a completely submerged inlet shall be based on the following orifice equation:

$$\mathbf{Q = 4.84\ A\ H^{1/2}} \qquad \textbf{[Eqn. 4.2]}$$

Where:
A = Area of inlet opening

The curves shown in Figure 4.2~~Figure 4.2~~ and Figure 4.3~~Figure 4.3~~ provide for direct solution of the above equations.

In order to facilitate the computations required in determining the various hydraulic properties for curb inlets and drop inlets in sump conditions, Figure 4.4~~Figure 4.4~~ Computation Sheet has been prepared.

Column 1 Inlet number and designation.
Column 2 Total flow in *cfs* to inlet. For inlets other than the first inlet in a system, flow is the sum of runoff from the contributing area plus carry-over flow from inlet or inlets upstream.

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Column 3 Assumed length of inlet opening or perimeter in feet.

Column 4 Total area of inlet opening based on assumed inlet opening length and opening height.

Column 5 Discharge per unit foot of inlet opening. Column 2 divided by Column 3.

Column 6 Computed head at inlet for weir flow conditions based on Figures 4.2 or 4.3 or the following equation:

$$H = (q / 3)^{2/3} \quad \textbf{[Eqn. 4.3]}$$

Column 7 Computed head at inlet for orifice flow conditions (submerged inlet) based on Figures 4.2 or 4.3 or the following equation:

$$H = [(Q / A) / 4.82]^2 \quad \textbf{[Eqn. 4.4]}$$

Column 8 Maximum allowable head at sump inlet. This value is determined from topographic conditions at the sump inlet site.

Column 9 Width of spread of water for curb inlets in sump.

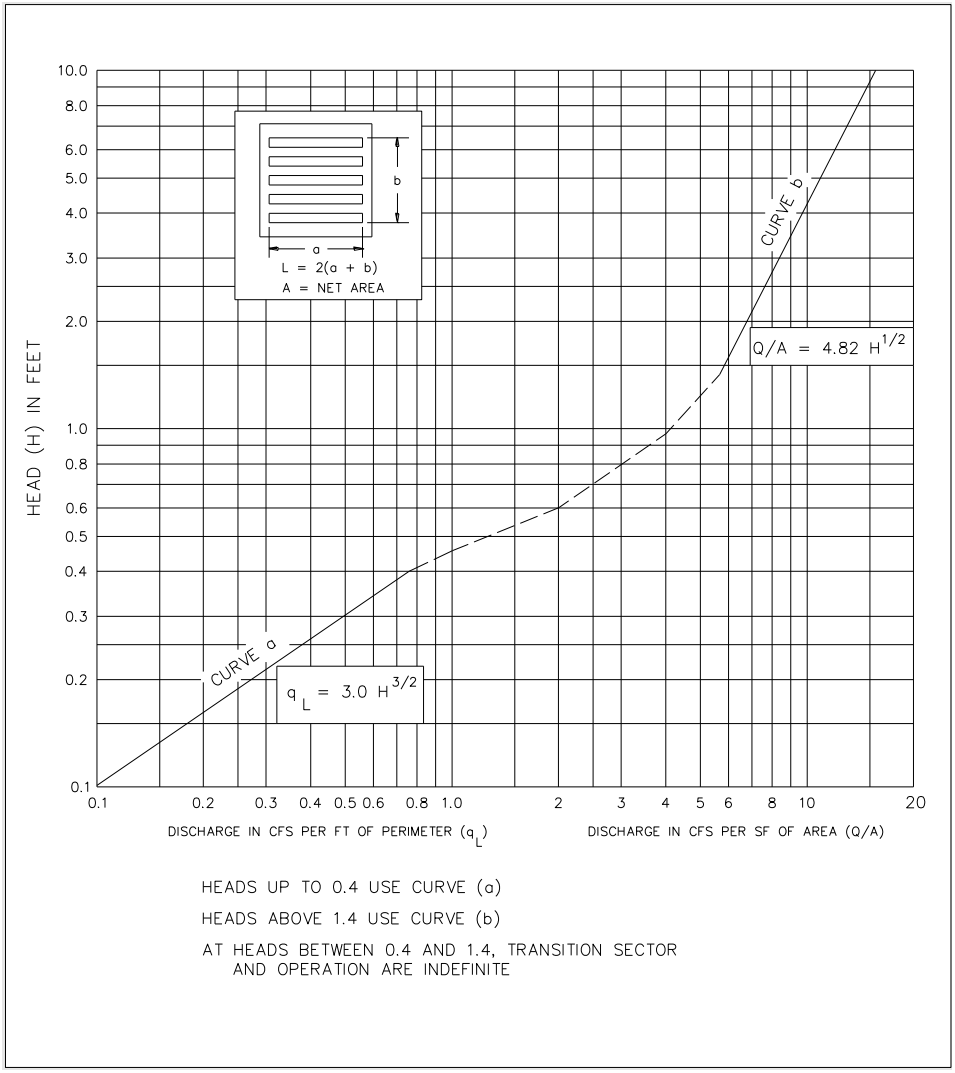


Figure 4.2 Capacity of Grate Inlet in Sump

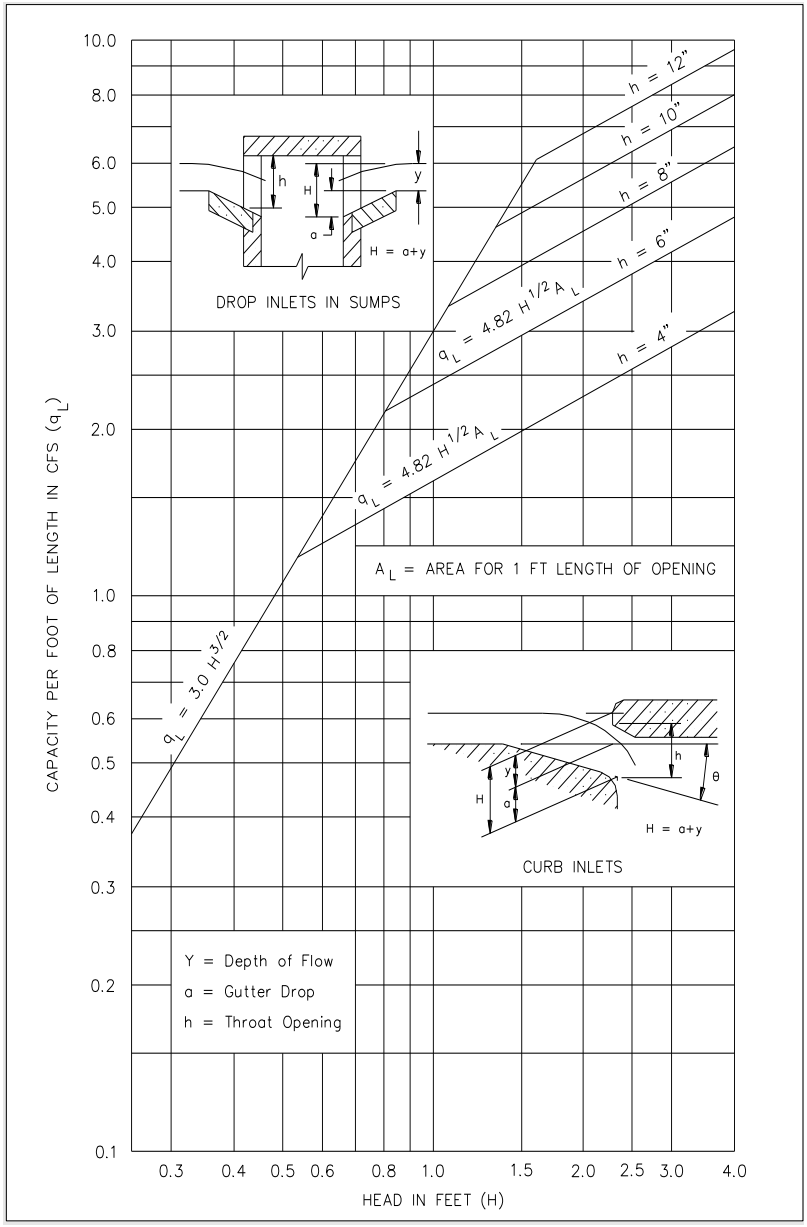
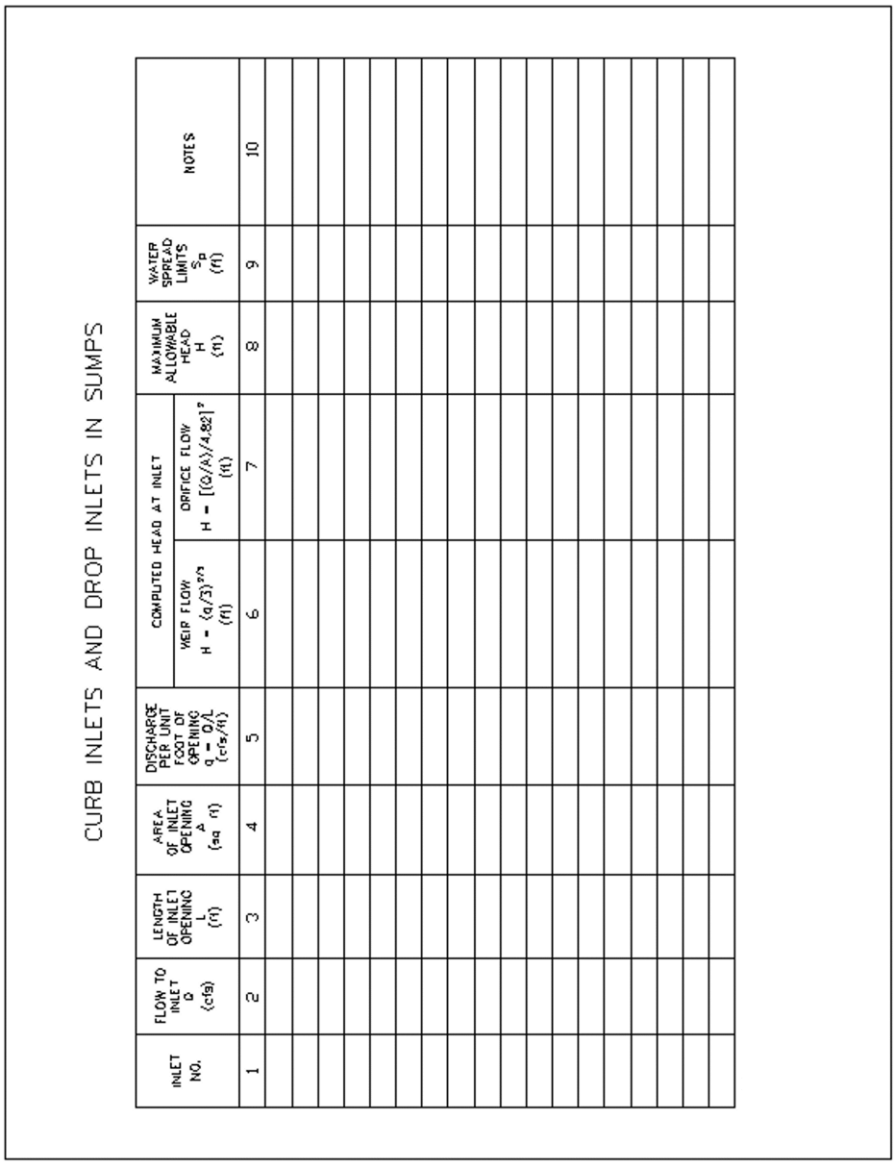


Figure 4.3 Capacity of Drop Inlets and Curb Inlets in Sumps



CURB INLETS AND DROP INLETS IN SUMPS

INLET NO.	FLOW TO INLET Q (cfs)	LENGTH OF INLET OPENING L (ft)	AREA OF INLET OPENING A (sq ft)	DISCHARGE PER UNIT FOOT OF OPENING q = Q/L (cfs/ft)	COMPUTED HEAD AT INLET		MAXIMUM ALLOWABLE HEAD H (ft)	WATER SPREAD LIMITS S_p (ft)	NOTES
					WEIR FLOW $H = (q/3)^{2/3}$ (ft)	ORIFICE FLOW $H = [(Q/A)/4.82]^2$ (ft)			
1	2	3	4	5	6	7	8	9	10

Figure 4.4 Computation Sheet for Curb Inlets and Drop Inlets in Sumps

b. Inlets on Grade

The capacity of a curb inlet on grade will be based on the following equation:

$$Q / L_o = 0.7 [1 / y_o] [(H)^{5/2} - (a)^{5/2}] \quad \textbf{[Eqn. 4.5]}$$

Where:
Q = Discharge into inlet (cfs)
L_o = Length of inlet opening (feet)
a = Gutter depression (feet)
y_o = Depth of flow in approach gutter (feet)
$H = a + y_o$

The curve shown in Figure 4.6 provides for the direct solution of the above equation when the value of y_o is known. The curve shown in Figure 4.7 provides for the determination of the ratio of the intercepted flow by the inlet to the total flow in the gutter.

In order to facilitate the computations required in determining the various hydraulic properties for curb inlets on grade, Figure 4.5 shows Computation Sheet prepared.

Column 1 Inlet Type and number.
Column 2 Location of inlet by station number.
Column 3 Drainage Area designation of area entering between the previous pick up point and the inlet being designed.
Column 4 Peak Discharge (Q_p) from area of Column 3.
Column 5 Carry-over flow (q) which has been passed by the last preceding inlet to the inlet under consideration.
Column 6 Total gutter flow (Q_o) in cfs. For inlets other than the first inlet in the system, total gutter flow is the sum of the runoff from the contributing area plus carry-over flow from the inlet or inlets upstream. Column 4 plus Column 5.
Column 7 Reciprocal of the pavement cross slope for pavements with straight crown slopes.
Column 8 Reciprocal of the pavement cross slope (Z) divided by the pavement roughness coefficient (n).
Column 9 Slope of approach gutter (S_o) in feet per feet.
Column 10 Depth of gutter flow "y_o" in approach gutter direct from Manning's equation for triangular gutters:

$$y_o = 1.245 (Q^{3/8})[n^{3/8} / S^{3/16}] [1 / Z]^{3/8} \quad \textbf{[Eqn. 4.6]}$$

Column 11 Spread of water (S_p) or width of ponding in the gutter measured from the face of curb. Column 7 times Column 10.
Column 12 Width of street and height of parabolic crown.
Column 13 Slope of approach gutter (S_o) in feet per feet.
Column 14 Depth of gutter flow " y_o " in approach gutter. Column 15 Spread of water (S_p) or width of ponding in the gutter measured from face of curb.
Column 16 Discharge (Q) in cfs which will be intercepted by an inlet one (1) foot in length for a given depth of flow in the approach gutter (y_o).

Determined from Figure 4.6 or from the solution of the following equation:

$$Q / L_o = 0.7 [1 / y_o] [(H)^{5/2} - (a)^{5/2}] \quad \textbf{[Eqn. 4.7]}$$

Column 17 Length of inlet (L_o) in feet which is necessary to intercept a given discharge Q_o. Column 6 divided by Column 16.

Column 18 Actual length (L) in feet of inlet which is to be provided.

Column 19 Ratio of the length of inlet provided (L), to the length of the inlet required for 100% interception (L_o). Column 18 divided by Column 17.

Column 20 Percentage of discharge intercepted by the inlet in question determined from Figure 4.7 using the values determined in Column 19 and Column 10 or Column 14.

Column 21 Discharge (Q) in cfs which the inlet in question actually intercepts. Column 6 times Column 20.

Column 22 Carry-over flow (q) is the amount of water which passes any inlet, and is the difference between the total flow (Q_o) of Column 6 and the intercepted flow (Q) of Column 21.

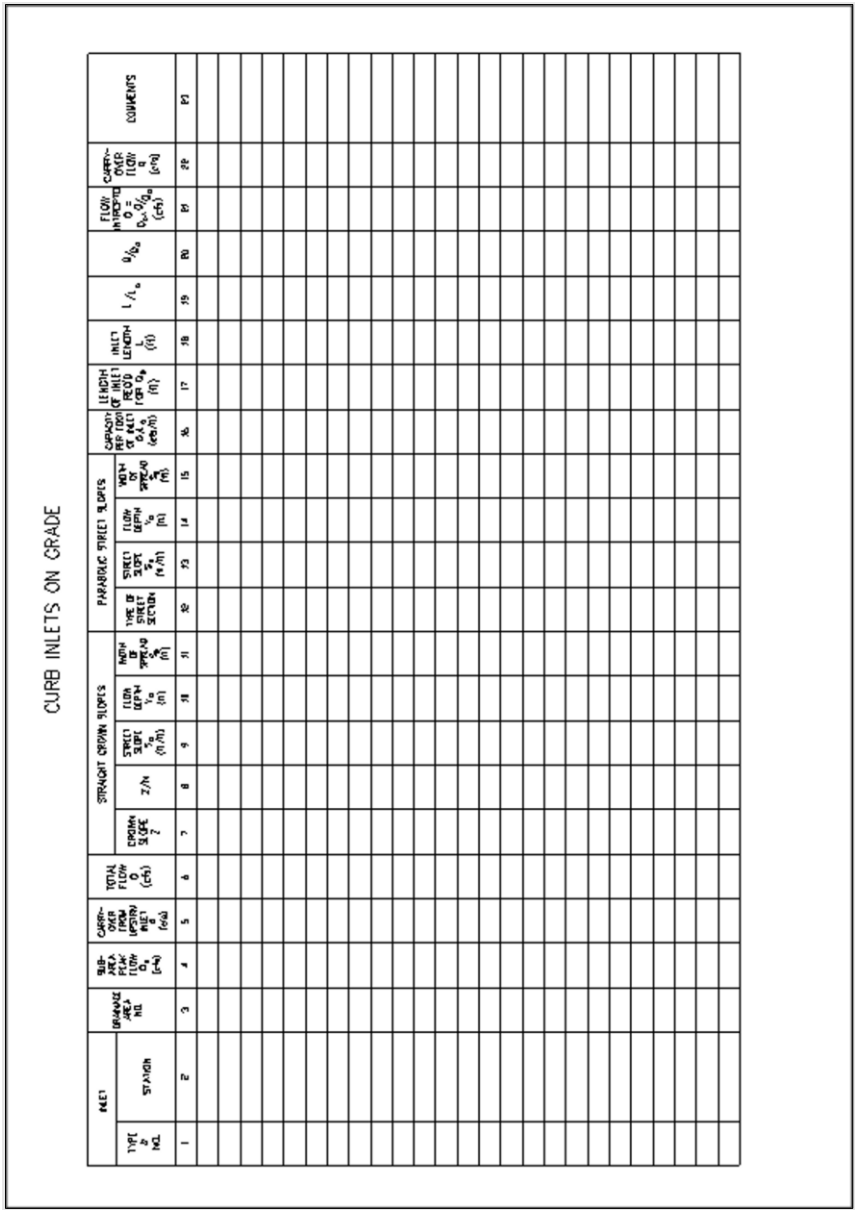


Figure 4.5 Computation Sheet for Curb Inlets On Grade

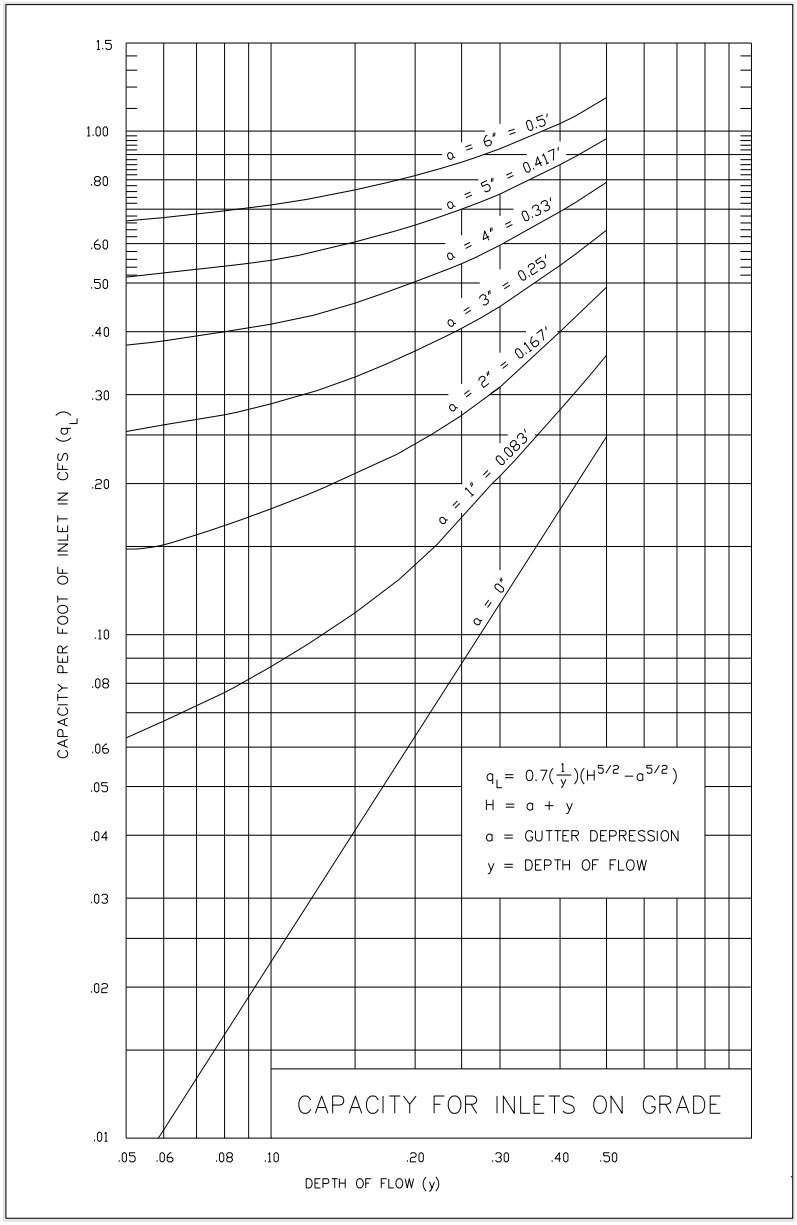


Figure 4.6 Capacity for Inlets On Grade

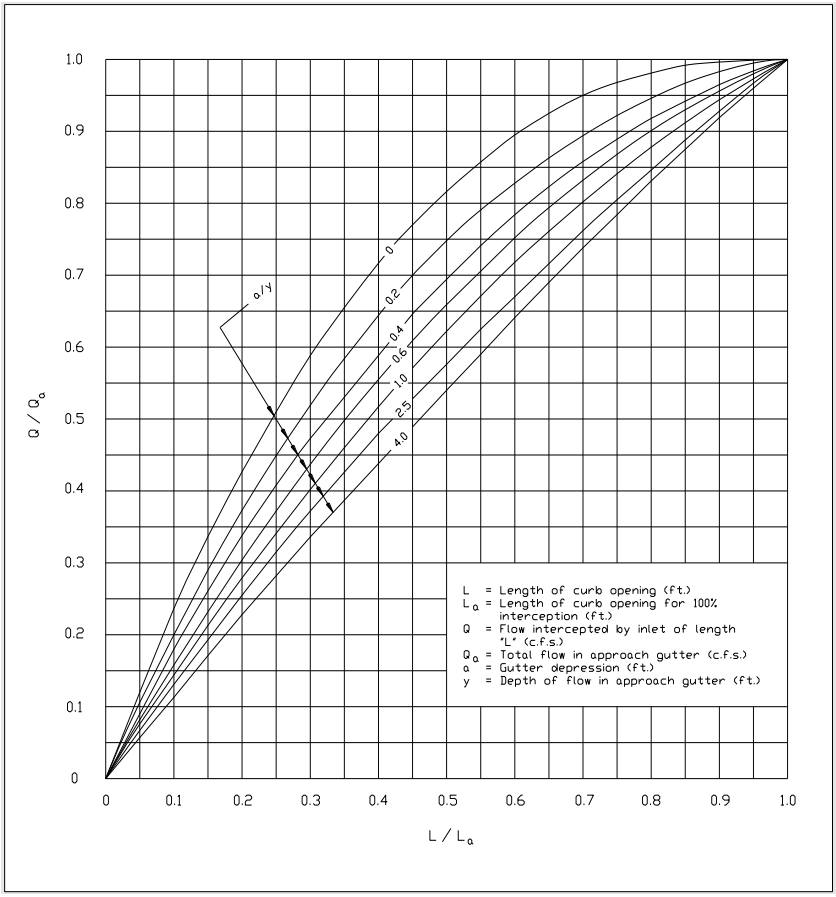


Figure 4.7 Ratio of Intercepted Flow to Total Flow for Inlet On Grade

E. Storm Drain Pipe Design

1. Design Frequency

   Pipe Design: *"Flood Mitigation"* storm event.

2. Design Criteria

   a. Storm drain systems capable of conveying the *"Flood Mitigation"* storm event are required when water spread, intersection cross-flow, and lot-to-lot drainage flow limits are exceeded, or when the minimum time of concentration shown in *Table 1.5 of the iSWM™ Hydrology Technical Manual Document* are reached. Closed pipe systems are required for discharges up to and including 300 cfs in public systems.

   b. Pipe material in a public storm drain system or in public ROW shall be reinforced concrete for all pipe sizes, or Polypropylene for sizes up to 60" inches, with appropriate bedding and class type depending on cover.

   c. Proposed storm drains may discharge into existing watercourses. *See Section 1.2.10 of the iSWM™ Hydraulics Technical Manual Document* for guidance related to the Tailwater elevation to be used for hydraulic grade line calculations.

   d. The maximum hydraulic gradient shall not produce a velocity that exceeds 15 fps. Table 4.6-C shows the desirable velocities for most storm drainage design. Storm drains shall be designed to have a minimum mean velocity flowing full at 2.5 fps.

Table 4.6-C: Desirable Velocity in Storm Drains

Description	Max. Desirable Velocity (fps)
Culverts (All types)	15
Inlet laterals	No Limit
Collectors (≤ 24 inches)	15
Mains (> 24 inches)	12

   e. The minimum desirable physical slope shall be 0.5% or the slope that will produce a velocity of 2.5 fps as required for the *"Streambank Protection"* storm event when the culvert is flowing partially full, whichever is greater.

   f. The potential hydraulic grade line elevation shall not exceed ground elevation or the gutter flow line, whichever is lowest.

   g. Access junction boxes are required along straight runs of closed conduits, with a maximum spacing of 500 feet for all pipe and box sizes.

   ~~g.~~h. A minimum of 24 inches~~"~~ of vertical separation shall be maintained between storm sewer conduits and any other utility. If it is not possible to provide 24" inches of vertical separation, the design must be approved through a Design Deviation Request and shall not provide separation less than 6 inches" and must provide a concrete cap between the crossing utility line.

   ~~h.~~i. Junction Boxes shall also be located at:

      i. any point where three (3) or more drainage conduits (laterals or trunk lines) come together;

      ii. any point where a trunk line size changes;

      iii. grade changes;

iv. the upstream end of the storm drain system;

v. Bends greater than 45 degrees;

vi. Pipe junctions greater than 45 degrees; and

vii. At the connection point between public and private storm sewer pipes or boxes. If this connection point is in the public ROW, pipe materials on the private system must meet public storm drain system materials requirements. If the connection point is on private property, then the public portion of the system must be contained in an easement.

~~i.~~j. Inlets will not be allowed to serve as a junction box, except through an approved design deviation request. Where inlets are permitted to serve as a junction box, the width of the inlet, at a minimum, shall be doubled in size. Storm drain systems parallel to the street will not be permitted to run directly through inlets.

~~j.~~k. Bends without junction boxes shall be limited to 45 degrees or less.

~~k. Pipe junctions without junction boxes shall be limited to 45 degrees or less.~~

l. The minimum storm drain pipe diameter shall be 18 inches.

m. Pipe diameters shall not decrease downstream.

n. Laterals shall be connected to trunk lines using a junction box or manufactured wye connections. Cut-in or punch-in connections to ~~trunk lines~~pipes are prohibited.

o. All cut-in or punch-in connections to precast inlets, junction boxes, box culverts, etc. will require a concrete collar to be poured around the connection.

p. Vertical or horizontal curves/deflections in the conduit will not be permitted.

F. Parking Lot Design

Parking lots shall be designed for the *"Flood Mitigation"* storm not to exceed top of curb with a maximum depth at low points of one (1) foot. The *"Flood Mitigation"* storm shall be contained on-site or within dedicated easements. The portion of the parking lot detaining water during the *"Flood Mitigation"* storm may be considered as part of the detention calculation for the site.

4.6.3 Open Channels

A. Design Frequency

1. Open channels, including all natural or improved channels, swales, and ditches shall be designed for the *"Flood Mitigation"* storm event.

B. Design Criteria

1. Depending on velocities (See Table 4.6-E~~Table 4.6-E~~), constructed or improved channels shall be designed with either an earthen channel or a 10-ft. minimum concrete pilot channel section and appropriate side slope protection up to the *"Streambank Protection"* storm event elevation, as described in Section 4.3.

2. All channels with contributing drainage basins larger than one (1) square mile (sq. mi.) shall remain in their natural condition.

3. Channels with a contributing drainage area of less than one (1) sq. mi. shall remain in their natural condition if they are identified as being within an ESA by the current City of Denton ESA map. Channels not identified as being within an ESA may be channelized, with the

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channelization method being determined by analysis of the erosive velocities.

4. All improved channels shall be designed to carry the flood mitigation flow and shall have one (1) foot of freeboard as illustrated in Figure 4.8~~Figure 4.8~~. Freeboard requirements at bends in all improved channels shall be the greater of the following:
   a. One (1) foot; or
   b. 10% of the flow depth
5. At a minimum, channels that require concrete lining shall be lined up to an elevation of the water surface resulting from the *"Flood Mitigation"* storm event.
6. Concrete lining of a stream channel is adding fill material into Waters of the United States (WOTUS) and must comply with Section 404 of the Clean Water Act, and all requirements outlined in DDC Section 7.4. Provide either proof of mitigation or letter of permission from the United States Army Corps of Engineers (USACE).
7. Unlined improved channels that contain bends may be required to be armored if maximum permissible velocities are exceeded.
8. Unlined improved channels shall have side slopes no steeper than 4H:1V and concrete-lined channels shall have side slopes no steeper than 2H:1V.
9. The minimum grade allowed on any channel, outfall channel, or ditch shall be three-tenths (3/10) foot per 100 feet for concrete-lined channels and five-tenths (5/10) foot per 100 feet for grass-lined channels.
10. Geotechnical investigations will be required for open channel designs to determine the type of soils present and allowable velocities shown in Table 4.6-D~~Table 4.6-D~~ and Table 4.6-E~~Table 4.6-E~~.
11. For vegetative channels, flow velocities within the channel shall not exceed the maximum permissible velocities given in Table 4.6-D~~Table 4.6-D~~ and Table 4.6-E~~Table 4.6-E~~.
12. An evaluation of streambank stabilization shall be included in the design of open channel improvements for areas upstream and downstream of the proposed improvement. Where indicated by the analysis, stabilization of the offsite bank areas shall be included in the proposed design.
13. HEC-RAS, or similarly capable software approved by the City's Engineer, shall be used to confirm the water surface profiles in open channels.
14. The final design of artificial open channels shall be consistent with the velocity limitations for the selected channel lining. Maximum velocity values for selected lining categories are presented in Table 4.6-D below.
15. If relocation of a stream channel is unavoidable, fill material into WOTUS must comply with Section 404 of the Clean Water Act, and all requirements outlined in DDC Section 7.4 . Provide either proof of mitigation or letter of permission from the United States Army Corps of Engineers (USACE).

The design of stable rock riprap lining depends on the intersection of the velocity (local boundary shear) and the size and gradation of the riprap material. More information on calculating acceptable riprap velocity limits is available in Section 3.2.7 of the *i*SWM™ Hydraulics Technical Manual Document.

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Table 4.6-D: Roughness Coefficients (Manning's *n*) and Allowable Velocities for Natural Channels

Channel Description	Manning's *n*	Max. Permissible Channel Velocity (fps)
MINOR NATURAL STREAMS		
Fairly regular section		
1. Some grass weeds	0.030	3 to 6
2. Dense growth of weeds, depth of flow materially greater than weed height	0.035	3 to 6
3. Some weeds, light brush on banks	0.035	3 to 6
4. Some weeds, heavy brush on banks	0.050	3 to 6
5. Some weeds, dense willows on banks	0.060	3 to 6
- For trees within channels with branches submerged at high stage, increase values by	0.010	
- Irregular section with pools, slight channel meander, increase above values by	0.010	
Floodplain - Pasture		
1. Short grass	0.030	3 to 6
2. Tall grass	0.035	3 to 6
Floodplain – Cultivated Areas		
1. No crop	0.030	3 to 6
2. Mature row crops	0.035	3 to 6
3. Mature field crops	0.040	3 to 6
Floodplain – Uncleared		
1. Heavy weeds scattered brush	0.050	3 to 6
2. Wooded	0.120	3 to 6
MAJOR NATURAL STREAMS		
Roughness coefficient is usually less than for minor streams of similar description on account of less effective resistance offered by irregular banks or vegetation on banks. Values of 'n' for larger streams of mostly regular sections , with no boulders or brush	0.028 to 0.060	3 to 6
UNLINED VEGETATED CHANNELS		
Clays (Bermuda Glass)	0.035	5 to 6
Sandy and Silty Soils (Bermuda Glass)	0.035	3 to 5
UNLINED NON-VEGETATED CHANNELS		
Sandy Soils	0.030	1.5 to 2.5
Silts	0.030	0.7 to 1.5
Sandy Silts	0.030	2.5 to 3.0
Clays	0.030	3.0 to 5.0
Coarse Gravels	0.030	5.0 to 6.0
Shale	0.030	6.0 to 10.0
Rock	0.025	15

Notes:
[1] For natural channels with specific vegetation type, refer to Table 4.6-E for more detailed velocity control.

Table 4.6-E: Maximum Velocities for Vegetative Channel Linings

Vegetation Type	Slope Range [1] (%)	Max. Velocity [2] (fps)
Bermuda Grass	0 – 5	6
Bahia	-	4
Tall fescue grass mixtures [3]	0 – 10	4
Kentucky bluegrass	0 – 5	6
Buffalo grass [4]	5 – 10 > 10	5 4
Grass mixture [4]	0 – 5 5 – 10	4 3
Sericea lespedeza, Weeping lovegrass, Alfalfa	0 – 5	3
Annuals [5]	0 – 5	3
Sod	-	4
Lapped Sod	-	5

Notes:
[1] Do not use on slopes steeper than 10% except for side-slope in combination channel.
[2] Use velocities exceeding 5 fps only where good stands can be maintained.
[3] Mixtures of Tall Fescue, Bahia and/or Bermuda.
[4] Buffalo Grass and Grass Mixture will be required over other vegetation types where the maximum velocity is not exceeded.
[5] Annuals – used on mild slopes or as temporary protection until permanent covers are established.

Source: Manual for Erosion and Sediment Control in Georgia, 1996.

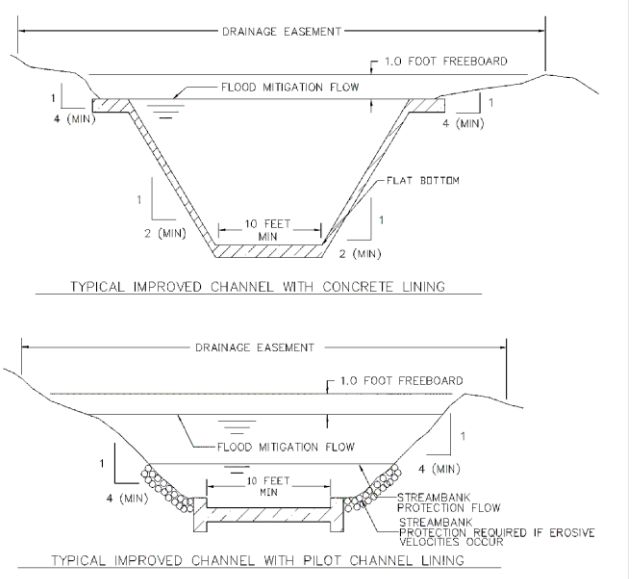

Figure 4.8 Freeboard Requirements and Channel Section Illustrations

C. Channel Drop Structures

1. Sloping channel drops are permitted and are required to have a maximum slope of 4H:1V. Vertical channel drops are not permitted.
2. The flow velocities in the channel upstream and downstream of the drop structure need to satisfy the permissible velocities allowed for channels (Table 4.6-D~~Table 4.6-D~~). The velocities shall be checked for flows produced by the *"Streambank Protection"* and *"Flood Mitigation"* storm events.
3. An apron shall be constructed immediately upstream of the chute or stilling basin to protect against the increasing velocities and turbulence which result as the water approaches the drop structure. The apron shall extend at least five (5) feet upstream of the point where flow becomes supercritical. In no case shall the length of the upstream apron be less than 10 feet.
4. An apron shall be constructed immediately downstream of the chute or stilling basin to protect against erosion due to the occurrence of the hydraulic jump. The apron shall extend a minimum of 10 feet beyond the anticipated location of the jump.
5. The design of drop structures is based on the height of the drop, the normal depths upstream and downstream of the drop structure, and discharge.
6. When used, channel drop structures shall be located near bridges or culverts, as directed by the City's Engineer.
7. The location of the hydraulic jump should be determined based on the upstream and downstream flow depths, and channel slopes.
8. The length of the hydraulic jump should be calculated to determine the length of the downstream apron required to prevent erosion.

4.7 Culverts

Culverts are cross drainage facilities that transport runoff under roadways or other improved areas.

4.7.1 Design Frequency

A. Culverts shall be designed for the *"Flood Mitigation"* storm.

B. The *"Flood Mitigation"* storm shall be routed through all culverts to ensure building structures (e.g., houses, commercial buildings) are not flooded and damage does not occur to a highway or adjacent property for this design event.

4.7.2 Design Criteria

A. Design Considerations

1. Roadway type;
2. Tailwater or depth of flow;
3. Structures, and property subject to flooding;
4. Emergency access; and
5. Road replacement costs.

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B. Velocity Limitations

1. The maximum velocity shall be consistent with channel stability requirements at the culvert outlet.
2. The maximum allowable velocity is 15 fps, but outlet protection shall be provided where discharge velocities will cause erosion conditions.
3. To ensure self-cleaning during partial depth flow, a minimum velocity of 2.5 fps is required for the "*Streambank Protection*" storm when the culvert is flowing partially full.

C. Headwater Limitations

1. The *allowable headwater* is the depth of water that can be ponded at the upstream end of the culvert during the *"Flood Mitigation"* storm event. The *allowable headwater* will be limited by both of the following constraints or conditions:
   a. The headwater must not damage upstream property.
   b. The culvert headwater plus 12 inches of freeboard shall not exceed (i) top of curb or (ii) pavement for the low point of the road over the culvert, whichever is lower.

D. Tailwater Considerations

1. If the culvert outlet is operating with a free outfall, the critical depth and equivalent hydraulic grade line shall be determined.
2. For culverts that discharge to an open channel, the stage-discharge curve for the channel must be determined. *See* Section 2.1.4 of the *i*SWM™ Hydraulics Technical Manual on methods to determine a stage-discharge curve.
3. If an upstream culvert outlet is located near a downstream culvert inlet, the headwater elevation of the downstream culvert will establish the design tailwater depth for the upstream culvert.
4. If the culvert discharges to a lake, pond, or other major water body, the expected "*Flood Mitigation*" storm event of the water body will establish the culvert tailwater.

E. Other Criteria

1. Culvert skews shall not exceed 30 degrees, as measured from a line perpendicular to the roadway centerline, without approval.
2. Erosion, sediment control, and velocity dissipation shall be designed in accordance with Section 4.0 of the *i*SWM™ Hydraulics Technical Manual Document.
3. Where applicable, culverts must comply with DDC Section 7.4 regarding Environmentally Sensitive Areas.

4.7.3 Driveway Culverts

Driveway culverts are only permitted in non-curbed roadway sections. All driveway culvert construction shall be inspected by the City during construction. All driveway culverts shall meet the following requirements:

A. All new driveway culverts must be designed to convey flows from a "*Flood Mitigation*" storm. Replacement driveway culverts shall be designed to convey the maximum reasonable discharge based on the existing ditch dimensions adjacent to the culvert.

B. Culverts shall have a minimum pipe diameter of 18 inches.

C. Acceptable culvert material shall be Reinforced Concrete Pipe (RCP) with a diameter of 18 to 42 inches. The RCP must be designated Class III at a minimum.

D. Box culverts shall have a minimum height of 24 inches. Culverts under City streets used for entrances to a subdivision shall be made of approved classes of reinforced concrete pipe or box.

E. The top of pipe elevation must be below the adjacent roadway edge of pavement elevation.

F. Pipe culverts shall utilize a safety end treatment conforming to the most current version of the TxDOT standard detail Safety End Treatment Plan – Parallel Drainage (SETP-PD) with the slope of the riprap being 6H:1V.

G. A driveway approach may utilize a low-water crossing in lieu of a driveway culvert, if all of the following conditions are met:

1. The lowest elevation of the proposed crossing can be no more than eight (8) inches below the road edge elevation.
2. The proposed low-water crossing cannot create a ponding effect on the upstream ditch (i.e., ditch flow line must be equal to or higher than the crossing).
3. Minimum cross slope for the crossing of 1.5%.
4. Low-water crossing shall be constructed of concrete adhering to the City of Denton Standard Details.
5. Toe walls on each side of the crossing shall be extended at least 15 inches below grade to prevent undercutting.

H. Culvert Slope requirements:

1. Culvert slope must provide positive drainage.
2. Culvert slope shall be set as shown on the approved subdivision construction plans.
3. Minimum slope shall be 0.3%.

I. Ditch Slope Requirements

1. The ditch shall be graded upstream and downstream as far as necessary to provide positive drainage with no areas of standing water.
2. Minimum earthen slope is 0.5%.
3. Minimum concrete slope is 0.3% for 2-ft. concrete pilot channels, if 0.5% earthen slope is unobtainable.

4.8 Bridges

4.8.1 Design Frequency

A. *"Flood Mitigation"* storm must be used for all bridges.

4.8.2 Design Criteria

A. A freeboard of two (2) feet shall be maintained between the computed design water surface and the low chord of all bridges.

B. Design guidance is provided in *Section 3.4 of the iSWM™ Hydraulics Technical Manual Document*.

4.8.3 Other Criteria

A. Where applicable, bridges must comply with DDC Section 7.4 regarding Environmentally Sensitive Areas.

4.9 Detention Facilities

4.9.1 Design Requirements

A. Detention facilities shall be designed for the four storms ("*Water Quality*", "*Streambank Protection*", "*Conveyance*", and *"Flood Mitigation"*) for the critical storm duration that results in the maximum (or near maximum) peak flow.

B. Dry detention basins must be sized to temporarily store the volume of runoff required to provide flood protection up to the "*Flood Mitigation*" storm.

C. Routing calculations must be used to demonstrate that the storage volume and outlet structure configuration comply with Section 4.5.5 of this Manual.

D. A calculation summary shall be provided on construction plans as shown in the computation sheet in Figure 4.9~~Figure 4.9~~ or its equivalent. Stage-storage-discharge values shall be tabulated and flow calculations for discharge structures shall be shown on the construction plans. Detention design shall follow *i*SWM™ guidelines. It is the responsibility of the Engineer of Record to use appropriate methodologies presented in *i*SWM™ based on specific basin characteristics. Detailed calculations and a design narrative shall be provided for review in a supplemental report that is referenced on the construction plans. In general, the narrative shall provide basic design information, such as the hydrologic method applied, design assumptions, pre- and post-development site conditions, downstream constraints, environmental considerations, and design software version used, if applicable.

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E. Storage and dam safety design may be subject to the requirements of the Texas Dam Safety Program based on the volume, dam height, and level of hazard. Earthen embankments six (6) feet in height or greater shall be designed per the TCEQ guidelines for dam safety (*See* Texas Administrative Code, Title 30, Part 1, Chapter 299 Dams and Reservoirs for current dam safety criteria).

F. An Operation and Maintenance Manual must be submitted with the civil engineering plans for all private detention basins. Private detention basins shall be inspected by Public Works Inspection to ensure compliance with the design standards required by Section 7.5.3.F. of the DDC. Inspection fees will apply.

4.9.2 Design Criteria for Above Grade Detention Facilities

A. Grading Standards for Above Grade Detention Facilities:

1. Vegetated channel slopes shall not exceed 4H:1V slope. Concrete-lined embankment slopes shall not exceed 2H:1V slope. Vertical walls may be allowed but must be structurally designed to account for inundation of the base and drawdown upon pond draining and must have a 6-ft. high security fence at the top.

2. The side slope for any excavated detention basin, which is not in rock, shall not exceed a 4H:1V slope.
3. Bottom slopes of detention facilities should not be less than 1%.
4. Armored slopes shall be no steeper than 2H:1V.
5. The embankment crown width shall be determined based on a geotechnical investigation of the detention facility site. The minimum width of the embankment crown shall be 12 feet.
6. Earthen embankments used to impound detention water must have a non-permeable core and shall be based on a geotechnical investigation of the site. The geotechnical investigation shall be performed by a Professional Engineer, licensed by the State of Texas, and shall include at a minimum the type of material on-site (or other material to be used in the embankment), moisture content, liquid limit, plasticity index, and required compaction.
7. A Concrete pilot channel with a minimum width of 10 feet, and a minimum slope of 0.5% shall be constructed at the bottom of the detention pond. Privately maintained ponds shall have a concrete pilot channel with a minimum width of six (6) feet.
8. Private Detention Basins shall be designed with 10-ft. wide unobstructed maintenance access around the entire perimeter of the pond.
9. Public Detention Basins shall be designed with 20-ft. wide unobstructed maintenance access around the entire perimeter of the pond.
10. Where deemed necessary by the City's Engineer, security fencing with a minimum height of six (6) feet shall encompass the detention storage area if the velocity, depth, or slopes create a potentially dangerous condition. The fence shall be designed to allow access for maintenance and so as not to restrict stormwater flow into or out of the detention basin. A maintenance equipment access ramp shall be provided for all detention facilities. The slope of the ramp shall not exceed 6H:1V and the minimum width shall be 12 feet.

B. Emergency Spillway, Overflow Path, and Freeboard:
1. A freeboard of one (1) foot will be required between the *"Flood Mitigation"* storm water surface elevation and top of bank.
2. An emergency spillway shall be provided at the flood mitigation maximum storage elevation with sufficient capacity to convey *"Flood Mitigation"* storm inflow rates with six (6) inches of freeboard. This is the peak of the inflow hydrograph coming into the pond and must not account for attenuation effects of the pond. Spillway requirements must also meet all appropriate State and Federal criteria.
3. An emergency overflow path, free of structures or obstructions, must be provided to convey the spillway design discharge to a downstream ROW or drainageway with adequate capacity for the discharge. No impediments to flow are allowed within the emergency overflow path (E.g., fences, trees, parking areas, or buildings). If a fence around a detention facility is needed to restrict access, the bottom of the fence must be elevated to provide a minimum of one foot of freeboard above the emergency overflow WSEL where the fence crosses the spillway. Nevertheless, fences across spillways should be avoided whenever possible. Even if the fence is elevated to the freeboard elevation, there is still the potential for the fence to catch debris floating on the water surface.
4. An emergency spillway must be constructed of concrete.

5. Design calculations shall be provided for all spillways and outlet structures.

C. Landscaping Requirements:

1. All detention basins shall be designed with plantings that minimize erosion based on expected inundation frequencies. Design guidance is provided in the *iSWM™ Landscape Technical Manual Document*.

D. Multiple Use Guidance

Limited recreational equipment (such as picnic tables or playground equipment) and trees may be permitted in private detention facilities with the following restrictions:

1. User access must be provided at a maximum 10% slope in at least two (2) locations, or one (1) location that comprises not less than 20% of the perimeter of the facility.

2. No recreational equipment is permitted in any portion of the facility that lies more than 18 inches below the flood mitigation water surface elevation level of the facility.

3. Recreational structures including, but not limited to, picnic tables and playground equipment, must be rust-resistant and anchored to the ground.

4. Mulch, wood chips, gravel, or rubberized pellets are not permitted within a detention facility due to the likelihood of their floating into the outlet structure.

5. Trees, shrubs, and other woody vegetation will not be permitted in the embankment of any detention facility or in the maintenance access area around such a facility.

6. A maximum of one (1) isolated tree per 5,600 sq. ft. may be permitted in the recreational area of the pond. A trash rack must be used to prevent clogging of the outlet structure. No bark mulch may be used around trees.

E. Retaining Walls

1. Any freestanding retaining wall used to detain water must be designed by a structural engineer to withstand the expected hydraulic forces when the detention area is filled to capacity. These walls must be constructed using reinforced concrete.

2. Any inlet or pipe connections to retaining walls must be designed with a reinforced concrete headwall. The height of this headwall shall match the height of the adjacent retaining wall. The most recent TxDOT details for concrete headwalls shall be used to determine other headwall dimensions and reinforced schedule.

4.9.3 Design Criteria for Underground Detention Facilities

Underground detention is highly discouraged because of the potential for deferred maintenance, the difficult and potentially hazardous nature of access for maintenance, and issues related to anaerobic conditions and pollutant mobility from devices that retain water between events. In any instance where underground detention is contemplated, thorough consideration must be given to the concerns described above to ensure ongoing inspection, maintenance, and functionality. Care should be taken to address material selection for underground detention due to the potential for adverse soil conditions to inhibit the system from functioning properly. A geotechnical engineer shall be consulted to ensure soil and other conditions are appropriate for the selected detention material.

A. Underground detention facilities shall be designed with reinforced concrete and have a minimum pipe diameter of 30 inches to allow for safe access and maintenance of the facility.

B. If an underground vault has multiple chambers, access openings with a maximum spacing of 500 feet must be provided for each chamber.

C. Underground facilities must be located to enable safe access for maintenance and minimize disruption of aboveground uses during maintenance. Access openings shall not be placed in areas that are routinely used for parking.

D. Easements must be provided for all underground detention facilities. If underground detention facilities are bound by private property, the easements must include an additional four (4) feet from the perimeter of the facilities.

E. Underground detention and water quality facilities are prohibited underneath buildings, walls, or other structures.

F. Every SWFMA involving underground detention and water quality facilities must include inspection and maintenance requirements to be performed quarterly and following any rainfall event of 0.5 inches or more. The inspection and maintenance frequency may be reduced after five (5) years of operation, if the owner demonstrates that a lesser frequency is appropriate.

G. A surface emergency overflow path, free of obstructions, must be provided for all underground detention facilities. The emergency overflow path must have sufficient capacity to convey the "*Flood Mitigation*" storm inflow rates to the underground detention facility. This is the peak of the inflow hydrograph coming into the underground detention facility, and must not account for any attenuation effects from the facility. The criteria for emergency overflow paths for surface detention facilities denoted in Section 4.9.2 above also apply to underground detention facilities.

H. Outlets from underground detention must consist of a pipe that can convey 120% of the 100-year outflow, with a minimum diameter of 12 inches. The invert of the outlet pipe must be at the lowest point in the detention facility to ensure that it fully drains.

I. Underground detention facilities shall be sloped to drain at a minimum floor slope of one (1) % ~~percent~~.

4.9.4 Design Criteria for Parking Lot Detention

Parking lot detention may be allowed if the following minimum criteria are met:

A. Use of parking lot surface area as detention is permitted, but only up to the lowest curb elevation of the parking lot.

B. The maximum ponding depth for the 100-year storm must be no more than 12 inches at the deepest point.

C. The outlet must be designed to minimize modifications that affect detention functions. The applicant must evaluate potential future resurfacing activities for impacts to detention volumes and release rates.

D. Ponding water in frequently used portions of parking lots must be avoided. At least two signs are required for all parking lot detention areas. The signs must have a minimum area of 1.5 square feet and contain the following message:

WARNING

This area is a detention basin and is subject to periodic flooding to a depth of (provide design depth).

Sign materials, geometry, and location must be submitted to Development Facilitation and approved by the City's Engineer.

4.9.5 Design Criteria for Pumped Detention

A. A detention facility may not rely on a pump or other mechanical equipment to drain water during a design storm.

4.9.6 Outlet Structures for Detention Facilities

A. Design Frequency

1. *"Water Quality"* storm
2. *"Streambank Protection"* storm
3. *"Conveyance"* storm
4. *"Flood Mitigation"* storm

B. Design Criteria

1. Outlet structures shall be designed in accordance with ~~s~~Section 2.2 of the *iSWM™ Hydraulics Technical Manual*. For water quality, refer to Section 2.2.3 for design of extended detention outlets.
2. The required storage volumes for "*Water Quality*", "*Streambank Protection*", "*Conveyance*", and *"Flood Mitigation"* storm events must be estimated.
3. If a detention facility includes extended detention, refer to Section 2.2.3 of the *iSWM™ Hydraulics Technical Manual* for design requirements.
4. All outlet orifices must be adequately protected from clogging and designed to ensure that people and large animals are kept out of confined outlet areas. Refer to Sections 2.2.5-*Extended Detention Outlet Protection* and 2.2.6-*Trash Racks and Safety Grates* of the *iSWM™ Hydraulics Technical Manual* ~~section 2.2.5 *Extended Detention Outlet Protection* and section 2.2.6 *Trash Racks and Safety Grates*~~ for design guidance.
5. Any top orifice on an outlet riser must be designed with a grate to prevent fall injuries.

~~2.~~6. Outlet velocities shall be within the maximum allowable range based on channel material, as shown in Table 4.6-D~~Table 4.6-D~~ and Table 4.6-E~~Table 4.6-E~~.

~~3.~~7. Outlet protection and energy dissipation facilities must be designed to avoid erosion problems downstream from outlet devices and emergency spillway(s).

~~4.~~8. Buoyancy calculations must be performed for the outlet structure and footing to ensure the outlet structure will not float. Flotation will occur when the weight of the structure is less than or equal to the buoyant force exerted by the water.

~~5.~~9. Any outflow structure that conveys water through an embankment in a conduit shall be reinforced concrete designed to support the external loads. The conduit shall be able to withstand the internal hydraulic pressure without leakage under full external load or settlement and must convey water at the design velocity without damage to the interior surface of the conduit.

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~~6. The minimum pipe size and box size shall meet the requirements as shown below in Table 4.9-A. These minimum sizes apply even when used in conjunction with weirs or other flow control devices and must be accessible for maintenance.~~

~~**Table 4.9-A: Outlet Pipe and Box Size**~~

~~Discharge Pipe Length~~	~~Minimum Pipe Size~~	~~Minimum Box Size~~
~~100 feet or less~~	~~18 inches~~	~~2-ft. x 2-ft.~~
~~Greater than 100 feet~~	~~36 inches~~	~~3-ft. x 3-ft.~~

~~7.~~10. The minimum opening of an inlet shall be six (6) inches in diameter or a 6-in. by 6-in. square. Smaller inlet openings may be used with a junction box and properly sized outlet structure.

~~8. Inlet openings less than one (1) sq. ft. in area shall be designed with trash racks to protect from clogging. The face of the trash rack should extend a minimum of six (6) inches from the face of the inlet opening.~~

~~9.~~1. ~~Any top orifice on an outlet riser must be designed with a grate to prevent fall injuries.~~

~~10.~~11. A concrete headwall and wingwalls shall be constructed at the outlet pipe opening. Orientation of the wingwalls will be governed by site specific conditions. Headwalls and wingwalls shall be designed to TxDOT standards.

~~11. Design guidance is in Section 2.2 of the *iSWM™ Hydraulics Technical Manual*.~~

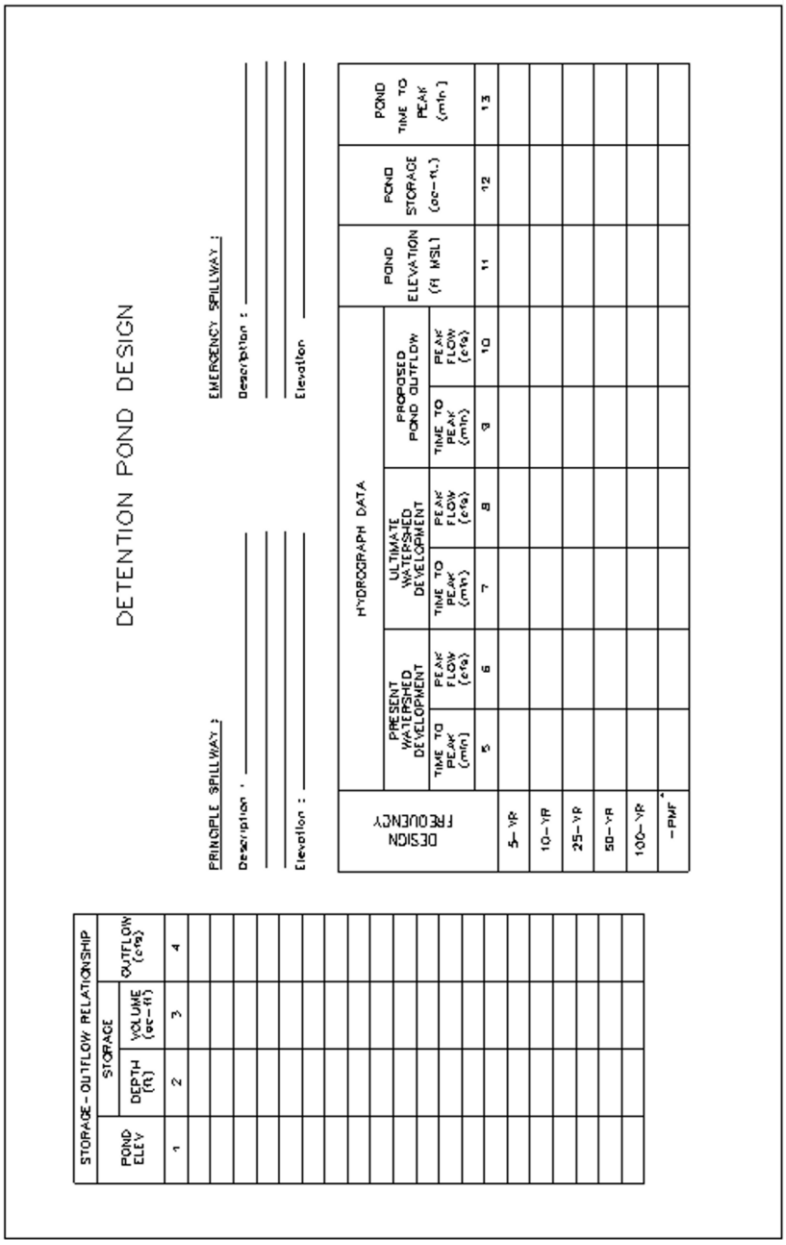

Figure 4.9 Computation Sheet for Detention Pond Design

4.10 Energy Dissipation

All drainage system outlets, whether for closed conduits, culverts, bridges, open channels, or storage facilities, shall provide energy dissipation when necessary to protect the receiving drainage element from erosion.

4.10.1 Design Frequency

A. *"Flood Mitigation"* storm

4.10.2 Design Criteria

A. Erosion problems at culvert, pipe and engineered channel outlets are common. Determination of the flow conditions, scour potential, and channel erosion resistance shall be standard procedure for all designs.

B. Energy dissipaters shall be employed whenever the velocity of flows leaving a stormwater management facility exceeds the erosion velocity of the downstream area channel system.

C. Energy dissipater designs will vary based on discharge specifics and tailwater conditions.

D. Outlet structures shall provide uniform redistribution or spreading of the flow without excessive separation and turbulence.

4.10.3 Recommended Energy Dissipater for outlet protection

A. Concrete or grouted rock riprap apron

B. Riprap outlet basins

C. Baffled outlets

D. Grade Control Structures

Design guidance is provided in Section 4.0 of the *i*SWM™ Hydraulics Technical Manual.

4.11 Floodplain

4.11.1 Floodplain Development Criteria

A. Floodplain alterations shall be allowed only if all the following criteria are met:

1. An approved Floodplain Development Permit must be issued by the City before any development is done within the floodplain.
2. Flood studies shall include flows generated for existing conditions and fully-developed conditions for the 10, 50, 100, and 500-year storm events.
3. Alterations shall not increase the 100-year fully-developed water surface elevation on other properties.
4. Alterations to the regulatory Floodway shall not increase the 100-year fully-developed water surface elevation at any point.
5. Alterations shall be in compliance with Federal Emergency Management Agency (FEMA) guidelines.

6. Alterations of the floodplain shall meet the requirements of Section 4.5 of this Manual.
7. Alterations shall result in no loss of valley storage for a Major Creek, as defined by the DDC, and a 15% maximum loss of valley storage for any other tributary for any reach, except at bridge and culvert crossings where it can be proven that there are no detrimental effects upstream or downstream.
8. Alteration of floodplain areas shall not cause any additional expense, including maintenance, related to any current or projected public improvements.
9. The floodplain shall be altered only to the extent permitted by equal conveyance on both sides of the natural channel, as defined by the USACE in a HEC-RAS analysis. The right of equal conveyance applies to all owners and uses, including greenbelt, park areas, and recreational areas. Owners may relinquish their right to equal conveyance by providing a written agreement to the City's Engineer.
10. A grading permit and/or construction plan approval shall be required to perform any grading activities on site.
11. The toe of any fill shall parallel the natural direction of the flow.
12. Floodplain alterations shall incorporate and consider other City planning documents and ordinances such as the Tree Preservation Ordinance (Section 7.7.4 – DDC), , the Subdivision Ordinance (Subchapter 8 – DDC), and the Floodplain Prevention and Protection Ordinance (Chapter 30 – City of Denton, Code of Ordinances).
13. Unless a pre-existing model is in place, USACE's HEC-HMS and HEC-RAS shall be used. A request to use another type of hydrologic or hydraulic model must be submitted for approval through a design deviation request. The Modified Puls method shall be used for flood routing information to ensure that the cumulative effects of the reduction in floodplain storage of floodwater will not cause downstream or upstream increases in water surface elevations and erosive velocities. If the Modified Puls method is not feasible, a request to use another type of flood routing method must be submitted for approval through a design deviation request.

B. The engineer of record is responsible for providing documentation of the relevant USACE approved permits prior to beginning modification of the floodplain and prior to causing any impacts to WOTUS. If applicable, the engineer of record is also responsible for providing a signed and sealed statement detailing why such permits are unnecessary.

C. Verification of Floodplain Alterations:
1. The owner and/or developer shall furnish, at their expense, to Development Services sufficient engineering information to confirm that the minimum FFEs proposed meet the requirements of the Flood Prevention Ordinance.
2. Construction plans will not be released for construction within areas subject to a Conditional Letter of Map Revision (CLOMR) or amendment until such plans are accepted by Development Services and FEMA.
3. Letters of Map Revision (LOMR) applications shall be submitted to Development Services (i) no later than 60-days from the City's final acceptance of the construction and (ii) prior to submittal to FEMA.
4. All submittals to FEMA shall be submitted to Development Services prior to submittal to

FEMA. A copy of all responses to FEMA comments shall be submitted to the City.

D. Development within the floodplain which does not result in any change to the topography, the amount or location of impervious area, or any change in the characteristics of the floodplain cross-section, such as underground utility construction, may not require a flood study, CLOMR, LOMR, or DSA unless requested by the City.

The following decision charts are intended to consolidate the floodplain development criteria in the City of Denton. They reference information found in the DDC Subchapters 7.4 and 7.5, the Code of the City of Denton, Texas, Chapter 30, and this Manual. They are not an exhaustive list of criteria and are only to be used as guidance as to the information provided in the above-referenced documents. Criteria in those documents supersedes the decision charts.

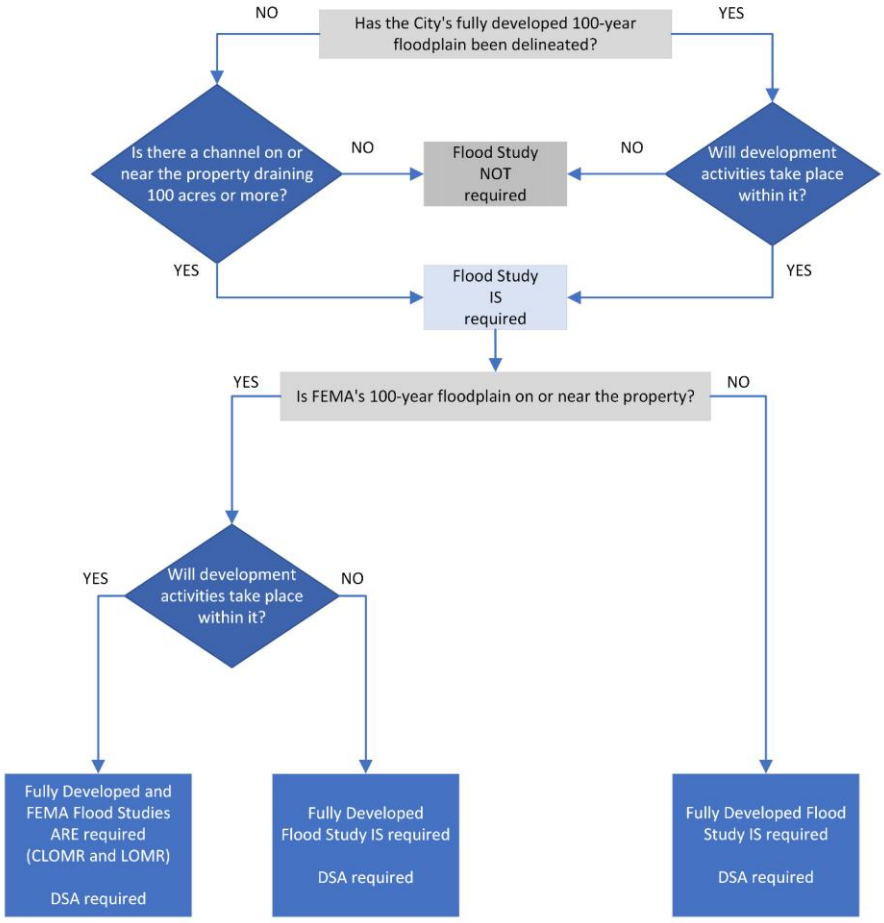

Figure 4.10 Flood Study Decision Chart

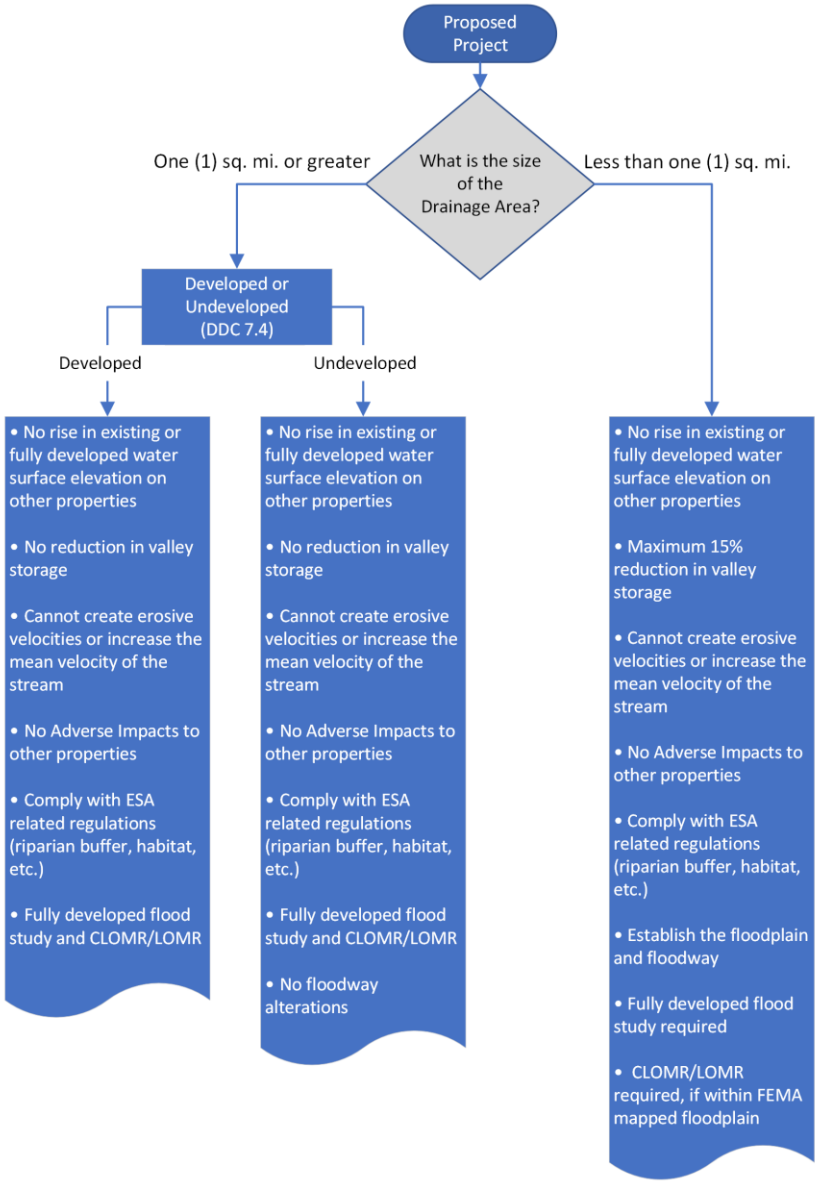

Figure 4.11 Summarized Floodplain Development Procedure

4.11.2 Procedures for Floodplain Alteration

Floodplain development is permitted when it complies with all requirements of the DDC, Flood Prevention Ordinance, and this Manual. The following are the engineering criteria for such requests.

Developments which impact designated FEMA flood plains in the City (Zones AE, A, and X shaded) shall submit minimum data required by FEMA, indicated on the City's CLOMR submittal checklist, and/or indicated in this Manual to FEMA for conditional approval. The Conditional Letter of Map Revision (CLOMR) shall be submitted to the City prior to approval of any Zoning Compliance Plan. Approval of CLOMR from FEMA will be required prior to acceptance of Civil Engineering Plans.

A. A written description of the scope of the proposed project and the methodology used to analyze the project's effects.

B. Hydraulic backwater models for 10, 50, 100, and 500-year floods for the following:
   1. Duplicate of the effective FIS model. The model must include:
      a. Existing conditions (effective FIS model including cross-sections through the project site. All cross-sections should reflect conditions prior to construction of the project); and
      b. Proposed conditions (existing conditions model reflecting the proposed project).

C. Floodway hydraulic backwater models of the following:
   1. Duplicate effective;
   2. Existing condition; and
   3. Proposed conditions.

D. In all the above hydraulic models, the following rules will apply:
   1. The hydraulic parameters, such as bridge loss coefficients, "*n*" values, etc., used in the effective FIS models will only be changed where obvious errors or changes have taken place and must be documented;
   2. The computed water surface elevation profiles must converge with the existing profiles; and
   3. Information should be shown on a map of suitable scale and topographic definition to provide reasonable accuracy.

E. A copy of the FIRM with the project area indicated.

F. Topographic mapping of the entire area covered by the proposed condition model, indicating the locations of all cross-sections used in the hydraulic model and delineating the proposed 100-year flood plain boundary.

G. Topographic mapping of the entire area covered by the proposed conditions model, indicating the locations of all cross-sections used in the hydraulic model and delineating:
   1. The proposed 100-year and 500-year floodplain boundaries; and
   2. The proposed floodway boundary.

H. Projects must comply with the requirements of 44 C.F.R. § 60.3(d)(2).

I. Upon completion of the proposed project, "as-built" and final LOMR plans certified by a Professional Engineer licensed by the State of Texas shall be submitted to the City for review and subsequent transmittal to FEMA. FEMA requires that individual legal notices be sent to all affected property owners when development (cut or fill) occurs in the regulatory floodway that would cause

any rise in the 100-year FIS water surface elevation. Public notice in the official community newspaper is required for proposed modifications to the regulatory floodway.

J. All items should be labeled for easy cross-referencing to the hydraulic model and summary data.

K. FEMA may have questions regarding the project. The engineer of record must address all of FEMA's comments. It is not anticipated, but if revisions to the development are required by FEMA, the developer is responsible for making the changes.

4.11.3 Fully Developed Water Surface Elevation Calculations

A. The following hydraulic data should be submitted to the City, preferably using the USACE HEC-RAS program to compute the channel's water surface elevation. The data should be submitted electronically as part of the CLOMR, LOMR, or flood study submittal.

1. Duplicate of the effective City fully developed backwater model or as developed by developer or property owner and approved by the City.
2. Modified existing condition backwater model – this model should include pre-development cross-sections through the project site obtained from field surveys or updated topographic information.
3. Proposed condition reflecting the development's impact on the flood plain area.
4. Water surface elevation and velocity summary tables tabulating the results of the above analysis.
5. Topographic map at a suitable scale with cross-sections that delineates the existing and proposed 1% chance (100-year) fully developed flood plain and shows the area being developed.
6. Analysis of the existing and proposed valley storage conditions of the area.
7. Documentation from the USACE determining if a 404 permit is required for the project.

4.11.4 Floodplain Alteration Guidelines

A. Side Slopes

1. To ensure maximum accessibility to the floodplain for maintenance and other purposes, and to lessen the probability of slope erosion during periods of high water, maximum slopes of filled area shall usually not exceed 4H:1V. Grass cover is required for all cut and fill slopes unless other armoring is required. Concrete riprap or an approved equal erosion protection measure is required on slopes steeper than 4H:1V. Vertical walls, terracing and other slope treatments will be considered only as:
   a. Part of a landscaping plan submission, and
   b. If no unbalancing of stream flow results.

B. Vegetation/Landscaping

1. Engineering plan submission shall include plans for:
   a. Erosion control of cut and fill slopes;
   b. Restoration of excavated areas; and
   c. Tree protection in and below fill areas.

2. Landscaping should incorporate natural materials (earth, stone, and wood) on cut or fill slopes wherever possible.
3. Applicant shall show in the plan the general nature and extent of existing vegetation on the tract, the location of trees in accordance with the requirements of the tree survey required by Section 7.7.4.E of the DDC, the areas which will be preserved, altered, or removed as a result of the proposed alterations.
4. Locations and construction details should be provided, showing how trees will be preserved in areas which will be altered by filling or paving within the drip line of those trees.
5. Applicant shall also submit plans showing location, type, and size of new plant materials and other landscape features planned for altered flood plain areas.

4.12 Drainage and Floodplain Easements

4.12.1 General

A. Drainage and floodplain easements shall be provided for all open natural streams or manmade drainage facilities. Easements shall encompass all areas lower than a ground elevation defined as being the highest of the following:
   1. 15 feet outside the calculated fully developed water surface elevation and associated flood boundary based on a design storm whose frequency is 100 years. All contributing watersheds are to be treated as fully developed for purposes of calculating the water surface elevation.
   2. The top of the high bank plus a minimum of 20 feet, if higher than stated in A.1. above.
   3. Existing natural banks with a slope steeper than 4H:1V shall have the easement line no closer than the intersection of a 4H:1V line extending from the toe of the slope to the proposed grade at the top of the bank, plus an additional 15 feet.
   4. Additional access area may be required according to the Section 4.12.2 below.

4.12.2 Storm Drain Easements

A. Above Ground Systems

Where an access road is required adjacent to a channel, an additional easement area of a minimum width of 15 feet shall be provided. The maximum cross slope shall be 2%. All access roads adjacent to improved channels shall be located within the drainage easement.

1. No structures, pavement, landscaping, or other above-ground man-made improvement shall be placed in a drainage easement, except where the easement is a public or private open space or park. Any such improvement within a drainage easement must be approved through a design deviation request.

B. Closed Systems

1. Easements for closed drainage systems shall meet the following minimum standards as shown below in Table 4.12-A.

Table 4.12-A: Easement Requirements for Closed Drainage Systems	
Pipe or Box Size	**Minimum Easement Width (feet)**
36 inches and under	16
42 to 54 inches	20
60 to 66 inches	25
72 inches and above	30

2. Utilities such as water and sanitary sewer lines may share a portion of a drainage easement, containing an underground enclosed drainage system where an additional easement width for a minimum of 10 feet is added to create a public drainage and utility easement. No utilities shall be located in any lined channel, pipe, or box in such a way as to interfere with flow capacity or maintenance of or access to the channel, pipe or box.
3. A drainage easement shall be provided for the area within a required outfall channel or ditch to the point where the flowline "day lights" on natural grade or matches existing topography.
4. To provide for maintenance, a drainage easement shall be provided at least 25 feet beyond any outfall headwall.
5. No structures, pavement, landscaping, or other above-ground man-made improvement shall be placed in a drainage easement containing a closed drainage facility.

4.12.3 Channel Access

A. Access areas and ramps shall be provided for all publicly maintained channels to allow for maintenance of the channels. These access areas and ramps shall be contained within a drainage easement. Access areas shall have a width of at least 12 feet, a minimum cross slope of 2%, and a maximum cross slope of 5%.

B. Access easements shall be provided from the public ROW to the access area, if the access area is not directly connected to the public ROW. Access easements shall remain free of obstacles that block the use of the easement, including ungated fencing across the easement.

C. A concrete drive approach serving the access easement must be available and free of obstructions. Any sidewalk crossing the access easement must be constructed using a residential street cross-section, or otherwise designed to accommodate vehicle loads so that equipment may use the access easement without damaging the sidewalk.

D. Access to all improved earthen channels shall be provided by one (1) of the following methods, depending on the size and depth of the channel:
   1. A clear access area must be provided on one side of the improved earthen channel along the full length of the channel; or
   2. If the channel is deeper than 4 feet or has a top width greater than 25 feet, an access area must be provided on both sides along the full length of the channel. Access areas shall have a width of at least 15 feet, a minimum cross slope of 2%, and a maximum cross slope of 5%.

E. All lined channels, and earthen channels with concrete pilot channels shall have a minimum bottom width of ten (10) feet and shall be provided with concrete access ramps. Concrete access ramps

shall have a minimum width of 12 feet, maximum slope of 6H:1V, and maximum cross slope of 5%. All access roads shall be located within a dedicated easement. Access road pavement cross-sections shall conform to the standards of the concrete residential street cross-section detail located in the City of Denton Standard Details.

4.12.4 Detention Facilities Easements

A. Detention facility easements must encompass the entirety of the detention facility plus any required maintenance access areas adjacent or leading to the facility.

B. All detention maintenance access easements must be connected to a public ROW, be a minimum of 10 feet wide, and be free of obstructions which could prevent personnel and equipment from accessing the detention facility.

4.12.5 Post-Construction Water Quality Control Structure Easements

A. All post-construction structural stormwater control structures must be located within an inspection access easement. The intent of this easement is to allow City staff to access and inspect the control structure to ensure it is being maintained in accordance with the SWFMA. This easement must be connected to a public ROW, be a minimum of five (5) feet wide, and be free of obstructions which could prevent City staff from accessing the control structure.

4.12.6 Fences

A. Fences in drainage easements are prohibited by the DDC, except as specifically provided for below.

1. Fences may cross~~in~~ drainage easements that contain an underground stormwater system ~~may contain~~provided the fence is constructed with any type of non-masonry ~~fence~~ material and ~~if~~ the fence is constructed with knock-out panels to facilitate maintenance.

2. Fences in drainage easements that contain overland flow may cross the easement if the fence is constructed with wrought iron (pickets and rails), pipe, or pipe and cable. Fence height, minimum picket spacing, and maximum ground clearance spacing shall be governed by appropriate child safety measures.

3. No fences are allowed across inlet or outlet structures of drainage detention facilities. Fences are permitted around the detention facility if they do not block or inhibit the flow conveyance of the detention facility.

4. No fencing is allowed across easements which share water or wastewater facilities with the drainage facility.

B. Fences in the floodplain are prohibited.

4.13 Water Quality

4.13.1 Water Quality Protection Volume

It is ~~recommended~~ required that all development~~s~~ sites disturbing a land area larger than (1) one acre or part of a common plan of development disturbing a land area greater than (1) one acre ~~with one (1) acre or more of disturbed land~~ treat their stormwater runoff either through extended detention and/or include site development controls necessary to remove 80% of the ~~total suspended solids (~~TSS~~)~~ from the water

quality protection volume (WQ_V). *See* the *i*SWM™ Water Quality Protection Technical Manual for information regarding the design of this WQ_V and appropriate discharge design. *See* the *i*SWM™ Site Development Controls Technical Manual for information regarding structural stormwater controls and their ability to remove pollutants in stormwater runoff to protect water quality. Any combination of structural stormwater controls may be used to achieve the required ~~recommended~~ 80% TSS removal from all runoff from impervious surfaces on the site. Any proposed proprietary treatment devices must be certified by either the New Jersey Department of Environmental Protection (NJDEP), the Washington state Technology Assessment Protocol – Ecology (TAPE) program, or the Technology Acceptance Reciprocity Partnership (TARP).

The percent TSS removal (%TSS) that is achieved on a site can be calculated using equation 4.8 below. This equation is an area-weighted TSS reduction equation that accounts for the TSS reduction attributable to each stormwater treatment best management practice (BMP) that is utilized on the site.

$$\%TSS = \frac{\Sigma_n^1 (TSS_1A_1 + TSS_2A_2 + \ldots + TSS_nA_n)}{\Sigma_n^1 (A_1 + A_2 + \ldots + A_n)} \quad \textbf{[Eqn. 4.8]}$$

Where: TSS_n = TSS removal percentage for each structural BMP located on-site (%);
A_n = the area draining to each BMP (acres).

When two or more BMPs are used in series (stormwater discharges from one BMP into another), a different calculation is necessary. This scenario is called a ***treatment train***. Stormwater discharging from the upper most BMP will be considerably "cleaner" than the influent, meaning TSS particle sizes will be much smaller. Pollutant removal rates for BMPs used in a treatment train are not additive. To calculate the total % TSS removal for a treatment train comprised of two or more structural BMPs, the following equation should be used.

$$TSS_{train} = A + B - \frac{A \times B}{100} \quad \textbf{[Eqn. 4.9]}$$

Where: TSS_{train} = total TSS removal for treatment train (%);
A = % TSS removal of the first (upstream) BMP
B = % TSS removal of the second (downstream) BMP

4.13.2 Water Quality Hotspots

Not all structural stormwater controls are appropriate for receiving runoff from hotspots. Hotspots are land uses or activities which produce higher concentrations of trace metals, hydrocarbons, or other priority pollutants. Examples of hotspots might include gas stations, convenience stores, marinas, public works storage areas, garbage transfer facilities, material storage sites, vehicle service and maintenance areas, commercial nurseries, vehicle washing/steam cleaning sites, landfills, construction sites, industrial sites, industrial rooftops, auto salvage or recycling facilities, and dog parks. Only appropriate structural stormwater controls identified in the *i*SWM™ Site Development Controls Technical Manual may be used for receiving hotspot runoff.

Facilities that discharge stormwater associated with industrial activity permitted under TCEQ Multi-Sector General Permit (TXR050000) may incorporate WQ_v requirements into point source discharge control requirements.

4.13.3 Required Stormwater Facility Maintenance Agreements

All private post-construction structural stormwater controls shall require a SWFMA in accordance with Section 4.14 of this manual.

4.13.4 Construction Erosion and Sediment Control Requirements

All land-disturbing activities must include provisions for erosion and sediment control in accordance with Section 7.3 (Land-Disturbing Activities) of the DDC, the *i*SWM™ Water Quality Technical Manual, the *i*SWM™ Construction Controls Technical Manual, and the *i*SWM™ Site Development Technical Manual.

A. Erosion Control Plans

The purpose of the Erosion Control Plan is to reduce erosion, retain sedimentation and, to the greatest extent, prevent off-site drainage during land-disturbing and construction activities. It does this by assessing the site's erosion potential to determine structural controls and site management practices, also known as Best Management Practices (BMPs).

1. General Erosion Control Plan Requirements

All erosion control plan must contain the following:

a. A narrative description of the project, total acreage of the parcel, total acreage to be disturbed, the construction sequence, the potential sources of erosion and sedimentation, BMPs, their maintenance, and inspection procedures.

b. A list of BMPs that will be implemented during each phase of construction, such as preservation of existing vegetation, stockpile management, silt fencing, outlet protection, runoff interception, vegetated buffers, etc.

c. A sequence of construction of the development site, including stripping and clearing; rough grading; construction of utilities, infrastructure, and buildings; and final grading and landscaping. Sequencing shall identify the expected date on which clearing will begin, the estimated duration of exposure of cleared areas, areas of clearing, installation of temporary erosion and sediment control measures, and establishment of permanent vegetation.

d. Description of on-site spoils and borrow areas, including handling and disposal of borrow materials, as well as size, depth of fill and revegetation procedures.

e. Descriptions of on-site and adjacent critical areas

f. Description of vegetative temporary and permanent stabilization practices

i. Areas within the limits of construction (LOC) that will require temporary stabilization

ii. Seeding mixtures and rates, types of sod, method of seedbed preparation, expected seeding dates, type and rate of lime and fertilizer application, and kind and quantity of mulching for both temporary and permanent vegetative control measures

iii. Specific limits on the time frame between initial exposure of soils by construction activity to the temporary or final stabilization of those surfaces

iv. Schedule for converting temporary controls to permanent functions (e.g. basins)

g. Drawings and specifications of structural controls and site management practices, with supporting calculations and assumptions

2. Phased Erosion Control Plans

~~Two-phased erosion control plans are required for non-linear projects with land-disturbing activities totaling five (5) acres or greater. Plans must be shown on separate sheets, and must also depict both existing and proposed contours.~~For projects with earthwork construction

totaling five (5) acres or more, a two-phased erosion control plan is required for all non-linear projects. Each phase must be provided as a drawing on a separate plan sheet. Drawings should address the transition between phases.

a. Phase 1 – Initial Land Disturbance: ~~this phase must utilize sediment and erosion controls prior to initial land disturbing activities and include structural controls that address low point runoff.~~This drawing shows BMPs to be installed prior to general clearing of the site. It should also show the existing contours, adjacent streets, ROW, easements and property lines. Do not show final contours on this drawing.

i. Show the BMPs selected for the following:

a) Downslope perimeter controls
b) Side-slope controls as needed per site conditions
c) Controls that will intercept runoff
d) Access barriers for areas to remain undisturbed, such as ESA and tree protection fencing

ii. Must show structures to be demolished and trees to be removed

iii. If installing sediment-trapping impoundments, such as sediment basins or interceptor swales, they must be shown on this phase as they are installed at the initiation of grading.

b. Phase 2 – Construction and ~~Individual Lot Phase with Behind Curb Controls~~Stabilization: This phase shows BMPs required during the rest of grading and construction, such as inlet protection. It must also include BMPs appropriate for final stabilization; seeding, sodding, flatwork, etc.

Individual Lot Phase: For multi-family development projects, the Phase 2 plan will also show behind-the-curb controls for individual lots, such as silt fencing, ground cover, and stabilized construction entrances.

3. For projects with earthwork construction totaling less than five (5) acres, phased erosion control plans are not required; the erosion control plan may be shown on a single sheet with the following:

a. Show existing contours
b. Show final contours
c. Show direction of flow during grading operations with arrows
~~i.~~d. Show areas to be permanently stabilized.~~this phase must require sediment and erosion controls during the installation of public/private infrastructure and include any controls to remain in place from Phase 1.~~

~~a. Behind the curb controls shall be installed upon the completion of street segments and must be included in Phase 2.~~

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B. Mass-Graded Drainage Area Map

~~Drainage area maps (DAMs) and calculations are required for all three (3) phases of development, as detailed below and shown in Figure 4.12.~~ In addition to an existing conditions drainage area map (DAM) and proposed conditions DAM, sites with earthwork construction ten (10) acres or greater must provide a mass-graded DAM showing interim contours and temporary drainage conditions created by earthwork construction and soil-leveling activities.

1. General Mass-Graded Drainage Area Map Requirements
   a. Show the delineation and contributing drainage area of temporary basins; do not show any basins that drain to permanent stormwater infrastructure. Temporary basins can only flow to existing features.
   b. Show and label contours created by earthwork construction. Do not show precise grades such as building footprints, lot lines, or finished floor elevations.
   c. Show the direction of flow for each temporary basin using arrows.
   d. Show the locations of any existing basins.
   e. Show the locations of any temporary sediment-trapping impoundments (optional)
2. For Sites with Ten (10) Acres or More Common Drainage
   a. Show and label the locations of any sediment-trapping impoundments, such as sediment basins or traps, or interceptor swales.
   ~~b. Calculations for each phase shall utilize a two (2)-year, 24-hour storm for the design of any hydraulic component of the erosion control plan including sediment basins, swales, channels, berm height, weir length, or any other outlet or conveyance structure required by the plan.~~
   ~~c. The DAM requirements for each Phase of development are as follows:~~
   ~~a. Phase 1: Existing Conditions DAM – existing contours and flow arrows reflecting pre-development conditions.~~
   ~~b. Phase 2: Mass Graded DAM – interim contours and flow arrows reflecting mass graded conditions prior to the public/private infrastructure installation stage.~~
   ~~c. Phase 3: Proposed Conditions DAM – proposed contours and flow arrows reflecting post-construction, stabilized conditions.~~

C. Sediment Basins

A sedimentation basin or similar sediment-trapping impoundment is required where 10 or more acres drain to a common area during any phase of development.

1. Sediment basins and other detention structures must provide storage volume for the runoff from a 2-year, 24-hour storm. Calculations must be included with the erosion control plan.
2. Sediment basin(s) or impoundments must provide at least 3,600 cubic feet (cu. ft.) of storage per acre drained until final stabilization of the contributing drainage area.
3. Sedimentation basins or impoundments must be designed by a Professional Engineer licensed in Texas or a Certified Professional in Erosion and Sediment Control (CPESC)

~~1.~~4. Sediment basins must be able to control and treat runoff within site boundaries; they should be installed as close as possible to the disturbed area or sediment source as possible. ~~capable of controlling runoff at the site.~~ Existing detention or retention ponds at the site may not be appropriate, as determined by City review staff.

~~2.~~5. Sediment basins must be designed, constructed, and maintained to minimize mosquito breeding habitats by minimizing the creation of standing water. Outlet structures shall be designed to provide a minimum dewatering time of 36 hours and a maximum dewatering time of 72 hours.

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~~3.~~6. When discharging from sedimentation basins and impoundments, the ~~permittee shall~~plan must utilize outlet structures that withdraw water from the surface. If this is infeasible, a reason must be provided to City review staff during planning.

D. Vegetation~~Vegetative stabilization is required for all permanent and temporary channels and basins. Plant selection guidance is provided in the iSWM™ Landscape Technical Manual.~~

Field Code Changed

1. Criteria for Stabilization

You are required to stabilize exposed portions of your site in accordance with DDC § 7.3.5.E, the TXR150000 CGP, the NPDES CGP, and federal "C&D Rule" permit requirements as found in 40 CFR 450.21. To be considered adequately stabilized, you must meet the criteria below depending on the type of cover you are using, either vegetative or non-vegetative:

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a. Vegetative Stabilization: If you are vegetatively stabilizing any exposed portion of your site through the use of seed or planted vegetation, you must provide established uniform vegetation (e.g., evenly distributed without large bare areas), which provides 70 percent or more of the density of coverage that was provided by vegetation prior to commencing earth-disturbing activities.

i. Immediately after seeding or planting the area to be vegetatively stabilized, to the extent necessary to prevent erosion on the seeded or planted area, you must select, design, and install non-vegetative erosion controls that provide cover (e.g., mulch, rolled erosion control products) to the area while vegetation is becoming established.

ii. For final stabilization, vegetative cover must be perennial

b. Deadline to Initiate Stabilization: You must initiate soil stabilization measures immediately whenever earth-disturbing activities have permanently or temporarily ceased on any portion of the site.

i. The term "immediately" means as soon as practicable, but no later than the end of the next workday, following the day when the earth-disturbing activities have temporarily or permanently ceased.

ii. Earth-disturbing activities have temporarily ceased when clearing, grading, and excavation within any area of the site that will not include permanent structures will not resume (i.e., the land will be idle) for a period of 14 or more calendar days, but such activities will resume in the future.

iii. The City closely adheres to the EPA's Construction General Permit and will consider any of the following types of activities to constitute the initiation of stabilization.

a) prepping the soil for vegetative or non-vegetative stabilization;
b) applying mulch or other non-vegetative product to the exposed area;
c) seeding or planting the exposed area;
d) starting any of the three activities stated just above on a portion of the area to be stabilized, but not on the entire area; and
e) finalizing arrangements to have stabilization product fully installed in compliance with the applicable deadline for completing stabilization

c. Deadline to Complete Stabilization Activities. As soon as practicable, but no later than 14 calendar days after the initiation of soil stabilization measures, you are required to have completed:

i. All activities necessary to initially seed or plant the area to be stabilized.

ii. You are required to have stabilized the exposed portions of your site prior to terminating permit coverage. You must submit your notice of termination (NOT) within 30 calendar days of completing earth-disturbing activities at your site.

2. Vegetative stabilization is required for all permanent and temporary channels and basins. Plant selection guidance is provided in the *i*SWM™ Landscape Technical Manual.

Field Code Changed

3. The erosion control plan must demonstrate reasonable preservation of trees and understory and that the following criteria is demonstrated in selection of trees to be preserved or removed:

a. Proximity of the trees critical root zone or drip line to proposed grading activity.

b. Permanent tree protection methods are employed to protect the preserved tree from damage where the trees critical root zone may be impacted.

c. Other measures have been employed, including site design that improves the chances for tree survival.

d. Temporary tree protection methods are adequately employed.

e. Construction methods for utility service to the site are used that allow protection and preservation of additional trees, such as, tunneling under the critical root zone, tree walls, or tree wells.

f. Utility trenching activities are indicated on the plan.

E. Structural Controls and Site Management Practices

1. Erosion and sediment control BMP design criteria shall adhere to the most current version of the *i*SWM™ Construction Controls Technical Manual, unless one of the following exceptions applies:

a. Linear projects may follow TxDOT standards; or

b. Proprietary erosion or sediment control devices may be utilized when:

i. Independent performance data is provided to prove a demonstrated capability of meeting a stormwater management efficiency equivalent to *i*SWM™ methods; and

ii. Supplementary data for systems or devices, such as instruction manuals and specification sheets, are provided and are demonstrated to be appropriate for use in North Central Texas site conditions, as determined by Environmental Services and Sustainability (ESS) department staff.

2. The City has restrictions on certain structural controls:

a. Curb inlet protection requires ESS approval to be used on active City streets

i. Organic filter tube curb inlet protection is prohibited

ii. Block and gravel filter curb inlet protection is prohibited

iii. Curb rock sock on-grade curb inlet protection is prohibited

F. Procedures During Construction

The Watershed Protection Division of the Environmental Services & Sustainability Department is primarily responsible for the inspection and enforcement of erosion and sedimentation control requirements on site developments and subdivisions. The City will monitor compliance with plan requirements and judge the effectiveness of the controls during different stages of construction

and before and after significant rainfall. The criteria and procedures contained in this section closely adhere to DDC § 7.3.4-6, the TXR150000 CGP, the NPDES CGP, and federal permit requirements as found in 40 CFR 122.26 & 123.25.

1. Criteria for Approvals Required Prior to the Commencement of Land-Disturbing Activities
    a. The project must have a valid, current city development permit or site plan.
    b. The developer, owner, or otherwise delegated applicant shall complete the appropriate survey(s)
        i. Applicants requiring a demolition permit must complete the Demolition Survey
        ii. Applicants requiring all other permits must complete the Construction Survey
    c. The applicant shall provide approved site plans and specifications for the development permit. For plans to be accepted, the locations and dimensions of all temporary and permanent erosion and sediment controls must be depicted. Specifications must include the maintenance routines, and schedules for installation and removal of controls, through all phases of construction.
    d. If the project requires a Stormwater Pollution Prevention Plan (SWPPP), the plan must be reviewed for completeness by City staff.
        i. The SWPPP must show consistency with City-approved plans (i.e. civil engineering plans and zoning compliance plans)
    e. Projects disturbing five (5) or more acres must submit a Notice of Intent to the City; or when the project is part of a common plan of development with disturbed acreage totaling five acres or more.
    f. Construction Site Notice (CSN)
        i. Executed CSN(s) are included in the SWPPP.
        ii. CSN(s) are posted publicly in locations near the site entrance, where they can be viewed by the general public.
2. Compliance Inspection by the City
    a. The project must pass an initial inspection for approval of permits and/or Notice to Proceed.
        i. The project must be in substantial compliance with the approved plans and specifications (ESCP) for the development permit
        ii. Controls must be installed in all required areas, such as:
            a) Perimeter controls
            b) Stabilized construction exit
            c) Protection of existing inlets
        iii. Clearing for the installation of erosion control devices shall not exceed a width of eight (8) feet and must not encroach into the dripline or critical root zone of any tree to be protected.
    b. The project will be routinely inspected during all phases of development to determine the compliance or non-compliance of a project's temporary erosion and sedimentation controls.
        i. Erosion and sediment controls must be installed for current development phase.

ii. Sediment basins (when required) must be installed at the initiation of grading at the associated drainage area; the deadline for installation is seven days after initiation.

iii. Vegetative temporary stabilization measures must demonstrate consistent progress toward stabilization. See previous section for criteria.

iv. Permanent stabilization must be initiated within 48 hours of completion of construction activities on areas of the site and completed for project prior to issuance of final Certificate of Occupancy.

v. Vegetative stabilization must demonstrate consistent progress toward 70% density of perennial vegetative cover.

3. Reinspection

a. Reinspection is conducted for sites that are out of compliance.

i. Standard timeframe for corrections is seven (7) business days.

ii. Enforcement may be escalated if there are impacts to offsite property or waterways.

iii. A reinspection fee may be assessed.

b. Reinspection with Notice of Violation (NOV) will be issued for continued stormwater non-compliance affecting stormwater, with reinspection fee assessed.

c. Reinspection with Stop Work Order (SWO) – Escalation issued for continued non-compliance affecting stormwater through failed erosion and sediment controls. Reinspection fee assessed.

i. Effective until deficiencies are corrected.

ii. Erosion and sediment control failures which threaten life or property may result in SWO without prior reinspection or NOV.

d. Reinspection Fees

i. Applicability – applies only to reinspection due to failure to comply with site stormwater quality requirements.

ii. Amount – As established in the Water and Wastewater Rate Book.

iii. Time of Payment – Payment is due per standard City of Denton utility billing dates.

~~ii. Erosion and sediment control BMP design criteria shall adhere to the most current version of the *i*SWM™ Construction Controls Technical Manual, unless one of the following exceptions applies:~~

~~iii. Linear projects may follow TxDOT standards; or~~

~~iv. Proprietary erosion or sediment control devices may be utilized when:~~

~~v. Independent performance data is provided to prove a demonstrated capability of meeting a stormwater management efficiency equivalent to *i*SWM™ methods; and~~

~~vi. Supplementary data for systems or devices, such as instruction manuals and specification sheets, are provided and are demonstrated to be appropriate for use in North Central Texas site conditions, as determined by City review staff.~~

~~Filter Tube Curb Inlet Protection and Rock Sock Curb Inlet Protection methods are prohibited.~~

~~vii. Wire Weir Curb Inlet Protection is not allowed on active City streets unless approved by City Watershed Protection.~~

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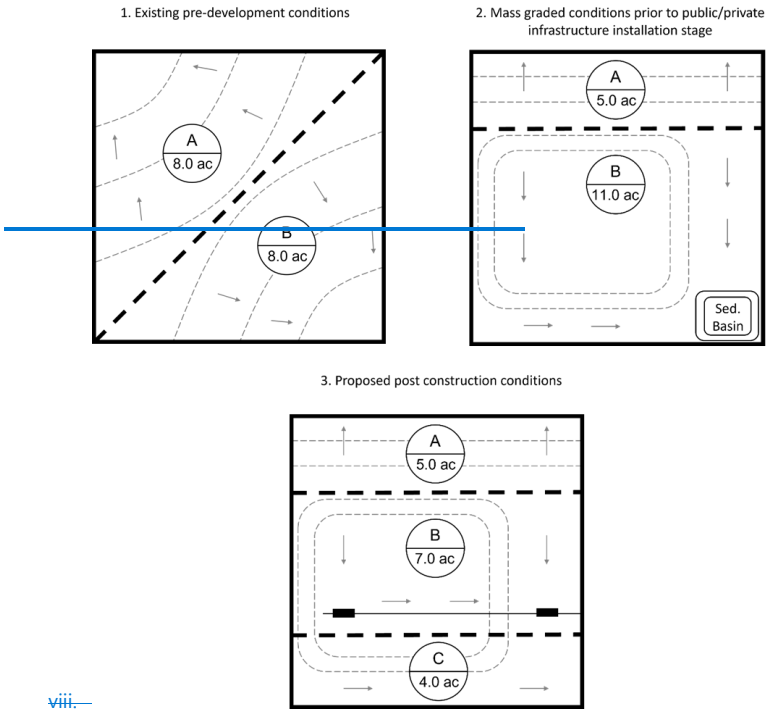

~~viii.~~

~~ix. Figure 4.12 Drainage area map examples required for the three (3) development phases~~

4.14 Stormwater Facility Maintenance Agreements

4.14.1 Maintenance Agreements

All drainage improvements constructed within a development and any existing or natural drainage systems shall require a maintenance agreement that identifies responsible parties for maintenance. The maintenance agreement shall be written such that it remains in force upon sale of transfer of the property.

As part of the Operations and Maintenance Plan submittal, a SWFMA must be prepared by the engineer of record for each stormwater control that will not be wholly maintained by the City. This agreement must outline preventive maintenance tasks and major repairs, identify the schedule for each task, assign clear roles to affected parties, and provide a maintenance checklist to guide future owners, including an annual self-inspection to be provided to the City. Multiple stormwater controls may be contained within a single Stormwater Facility Maintenance Agreement. When areas are identified for detention that also serve other purposes for the development (e.g. parking lots, loading docks) the requirement for a SWFMA may be waived.

4.14.2 Private Maintenance (SWFMA Required)

A. Private drainage facilities include those drainage improvements which are located on private property and which serve the needs of private development.

B. Private drainage facilities may also include detention or retention ponds, dams, and retaining walls intended to direct or contain runoff. Such facilities must be designed in accordance with sound engineering practices and reviewed and inspected by the City.

C. All SWFMA exhibits shall be reviewed and approved by the City with the civil engineering plans. The agreement for perpetual maintenance of private drainage facilities shall be executed with the City during per-construction. This agreement shall run with the land and can be tied to commercial property or to an owner's association, but not to individual residential lots.

D. The SWFMA shall provide the City with access to all private drainage facilities.

4.14.3 Maintenance Agreement Requirements

Details of the SWFMA must be set forth in a series of exhibits:

A. Exhibit A Legal Description - This includes the Metes and Bounds, a Surveyor's Drawing of the area occupied by the facility, and a copy of the preliminary or recorded plat containing the facility.

B. Exhibit B Design Plan and Specifications - These are summary documents intended for the use of future owners in conducting routine maintenance, inspections, and repairs. The documents include:

1. Design Data and Calculations - This can be in the form of a letter or statement from the engineer of record which summarizes critical design calculations related to the functionality of the facility, such as storage volume or TSS removal, and attests to the facility conforming to applicable *i*SWM standards;

2. Schematic Plan - This should be prepared by the engineer of record from construction drawings to show the general layout of the facility. Major features requiring regular or special maintenance should be shown and labeled in general terms understandable to a layman. A profile should be given showing critical elevations that control the function and capacity of the facility, and one or more cross-sections should be provided to indicate the general grading of the facility. A typical example of a schematic plan for a simple detention basin is shown in Figure 4.13 below; and

3. Landscaping - Vegetation should be shown consistent with the accepted Landscape Plan, either on the Schematic Plan or as a separate drawing.

C. Exhibit C Operations and Maintenance Plan - Specific maintenance tasks should be defined for each element of the facility. Maintenance tasks specific to the facility should be described in simple terms consistent with terminology contained in the Schematic and Landscape plans. An inspection and maintenance frequency should be established for each task.

D. Exhibit D Maintenance Checklist - A checklist consistent with the Operations and Maintenance Plan shall be provided for the use of future owners in performing routine and special maintenance tasks. This list should describe work required and frequency in language that is easy to understand and specific for the facility to be maintained. This form will be completed by the Owner and submitted to the City annually as part of a regular self-inspection program. *See* Appendix A for an example checklist for preparing a SWFMA for a simple detention basin.

Additional facility maintenance guidance for several types of stormwater controls is provided in the *iSWM*

Technical Manual. The engineer of record must certify that the construction has been completed in accordance with the general plans and Schematic Plan. After approval of construction by the City, the engineer of record is expected to provide guidance to the owner's representative in implementing the accepted maintenance program and to co-sign the first annual inspection after the construction.

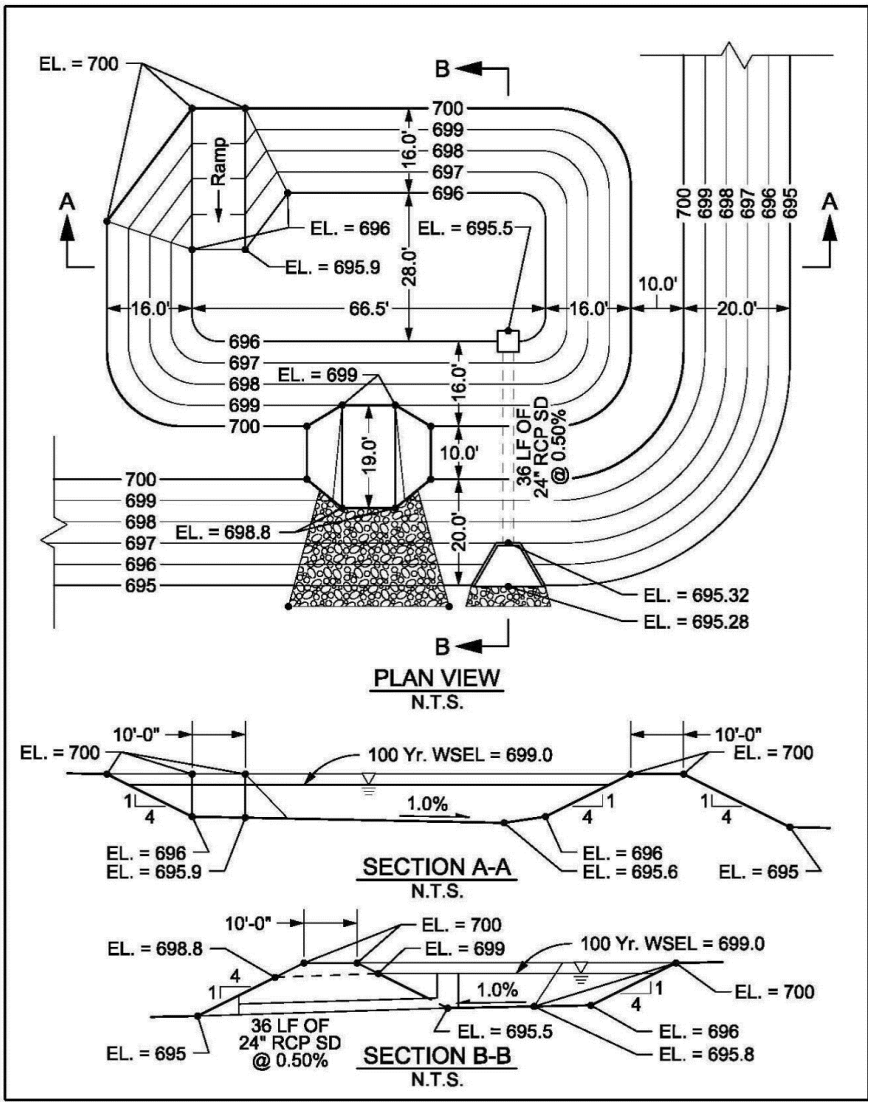

Figure 4.1213 Simple Detention Basin Plan Schematic

Section 5: Transportation Design Criteria

5.1 Overview

The purpose of Section 5 – Transportation Design Criteria is to provide ***minimum guidelines*** for the design and construction of transportation infrastructure within the City of Denton, Texas and its extraterritorial jurisdictions using the complete street and context-sensitive solution approach. The goal is to create safer, more livable places that are consistent with their social, environmental and economic values.

It is the responsibility of the design engineer to ensure the final design of transportation infrastructure are in conformance with the most recently adopted versions of the following documents:

A. City of Denton Mobility Plan;
B. City of Denton Code of Ordinances, Chapter 18 – Motor Vehicles and Traffic, and Chapter 25 – Streets, Sidewalks and Public Places;
C. The North Central Texas Council of Governments (NCTCOG) Public Works Construction Standards;
D. DDC Subchapter 7.8 – Access and Circulation;
~~D.~~
E. DDC Subchapter 7.9 – Parking and Loading;
~~E.~~F. DDC Subchapter 8.3 – Subdivision Design;
~~F.~~G. Americans with Disabilities Act (ADA) Standards for Accessible Design;
~~G.~~H. Public Right-of-Way Accessibility Guidelines (PROWAG);
~~H.~~I. The International Fire Code (IFC);
~~I.~~J. this Manual; and
~~J.~~K. relevant TxDOT, USDOT, NCHRP, FHWA, and AASHTO publications.

The criteria established in this Manual provide basic guidance for the design of transportation systems within the City of Denton. However, ***full responsibility and liability for proper design remains with the design engineer***. ***Users of this Manual should be knowledgeable and experienced in the theory and application of transportation engineering.***

Other design criteria may be warranted from applicable resources. The Federal Government, the State of Texas, NCTCOG, Denton County, Denton County Transit Authority (DCTA) and other related organizations and resources shall be consulted for additional criteria as may be deemed necessary. Along with this Design Manual, the DDC shall be consulted for additional guidance. The criteria established in this Manual do not supersede the policies contained in the DDC. Any revision to the DDC supersedes the criteria in this Manual.

5.1.1 Organization

Section 5 - Transportation Design Criteria is organized as follows:

A. Overview
B. Mobility Framework
C. Roadway Design

D. Intersection Design
E. Auxiliary Roadway Design
F. Access Management
G. Bike and Pedestrian Facility Design
H. Transit Facility Design
I. Traffic Impact Analysis Guidelines
J. Pavement Design Standard
K. Complete and Context-Sensitive Streets

5.2 Mobility Framework

The City of Denton Mobility Plan should be reviewed relative to any proposed development.

It should be noted that the City of Denton Mobility Plan is a living document and is periodically updated to reflect the changes in the characteristics of anticipated traffic flow within the City.

5.2.1 Roadway Functional Classifications

~~The City of Denton Mobility Plan provides definitions for the street classifications. These street classifications apply to developments and/or street improvements within the City of Denton and are to be used for design purposes. These classifications were established in the Thoroughfare Plan based upon expected fully developed traffic volumes.~~The City of Denton uses the following roadway functional classifications in guiding developments and street improvements within its jurisdiction. They are to be used in conjunction with other City of Denton documents, as well as Complete Streets, Vision Zero, and Context-Sensitive Design considerations. These classifications were established in the Thoroughfare Plan based upon expected fully developed traffic volumes.

A. Freeway

~~Freeways are streets that are intended to move large volumes of traffic through and around the City and are typically maintained by the TxDOT. These street types are to have limited access as defined in Section 5.6 Access Management section of this Manual.~~

~~Freeways in the region typically have high design speeds and have on- and off- ramps to control access. In urban areas, these freeways have adjacent frontage roads that provide access to adjacent business that may front onto the corridor.~~Freeways are high-capacity roadways intended to move large volumes of traffic through the region, into, and out of the City of Denton. They are typically managed and maintained by external agencies such as ~~the Texas Department of Transportation (~~TxDOT~~)~~ and may include tolled or non-tolled facilities. Freeways are limited-access facilities as defined in Section 5.6 ~~(~~Access Management~~)~~ of this Manual.

These facilities are designed as multi-lane, high-speed roadways with on- and off-ramps to control access and support long-distance regional and interstate travel. In urban areas, freeways are often accompanied by frontage roads that provide access to adjacent properties and businesses.

This Manual does not prescribe specific design standards for freeways, as their planning, design, and construction fall under the jurisdiction of TxDOT or other applicable agencies.

B. Primary Arterial

Arterial streets are streets that serve major routes into and through the City of Denton. They are often multi-lane thoroughfares that generally include a landscaped median. Arterial streets are shown on the City Mobility Plan. These street types are to have limited access as defined in Section 5.6 Access Management section of this Manual.

Primary arterials provide regional connectivity between different areas of Denton County and the DFW region. The design of arterial can vary depending on the surrounding land use and development. In urban areas, arterials may have wider sidewalks with smaller building setbacks, while suburban areas may have limited sidewalks with a larger buffer between the edge of the street and the building fronts. Refer to City of Denton Standard Details T112A and T112C for typical cross-section requirements and design guidance.

C. Secondary Arterial

Secondary arterials provide shorter connections and carry less traffic. Secondary arterials are still significant to vehicular travel as they serve trips of moderate length and provide more land access. They have a greater role in balancing local land access with moving people and goods. Typically, they have lower travel speeds and traffic volumes than Primary arterials. They also tend to be limited in width by the built environment that they serve and often have the greatest need for accommodation of high levels of use for all travel modes. Refer to City of Denton Standard Details T110A and T110C for typical cross-section requirements and design guidance.

D. Major Collector Street

A major collector is a roadway that collects and distributes traffic between collector streets/ local streets and arterial roads, supporting moderate traffic volumes. It typically accommodates 2–4 lanes and operates at lower speeds. Major collectors balance mobility and access, featuring wider lanes, occasional medians, and turn lanes to improve flow. These roads often include sidewalks, bike lanes, or shared-use paths, making them suitable for moderate-distance trips between neighborhoods, schools, and commercial areas. Refer to City of Denton Standard Details T113A-T1135A and T113C-T1153C for typical cross-section requirements and design guidance.

~~D.~~E. Collector~~s~~ Street

A collector street is a street that collects associated traffic from residential streets, rural streets, commercial streets, or industrial streets as designated on the City Mobility Plan.

Collectors in the City of Denton provide local land access and traffic circulation from residential neighborhoods to arterials or~~/~~ major collectors. They typically experience lower traffic volumes and have lower design speeds. Collector classifications include the following:

1. Commercial Collector – Provides circulation between commercial developments and the arterial or ~~/~~major collector system. Refer to City of Denton Standard Details T108A and T108C for cross-section requirements and design guidance.

Residential Collector – Functions as a residential street but is designed to accommodate higher traffic volumes and wider pavement widths than standard residential streets. Parking may be permitted depending on the context and adjacent land uses. Refer to City of Denton Standard Details T107A and T107C for cross-section requirements and design guidance.

2.

~~E.~~F. Local Streets

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A local street is a public street that provides access to adjacent property and are usually contained within the neighborhood. These streets have low speeds and low volumes associated with them. Local streets may be further classified into the following two (2) types:

1. Residential Street – A residential street is a public street associated with residential development within an urban environment. The residential street may ~~require parking or prohibit parking,~~ accommodate on-street parking, dependent on ~~use~~ the context and adjacent land uses. Refer to City of Denton Standard Details T105A and T105C for cross-section requirements and design guidance.
2. Rural or~~/~~ Suburban Residential Street – A rural street is a public street that connects rural communities. Refer to City of Denton Standard Details T106A and T106C for cross-section requirements and design guidance.

Existing or new industrial developments on local streets shall consult with the City's Engineer.

5.2.2 Auxiliary Roadway Classifications

Roadways that cannot be classified as thoroughfare, are grouped together as auxiliary roadways and are classified here as follows:

A. Alleys

An alley (residential or commercial) is designed to provide access to the rear of or side of a lot including solid waste and fire access. These pathways are narrower than standard streets, usually measuring 20 feet wide ROW ~~right-of-way,~~ and are not intended for through traffic but rather for serving adjacent properties. Alleys will be required for residential streets prohibiting on-street parking. Alleys are required in non-residential zoning districts where necessary to provide for adequate access for service vehicles, off-street loading or unloading, access for emergency vehicles, fire access or similar reasons consistent with the intent of the DDC.

B. Drives

A drive is an unobstructed paved area providing vehicular access from a street to a developed property. Drives can be classified as follows:

1. Driveway - A driveway is located entirely on private property. It is only for a single-family or a duplex property. It connects a drive approach to a garage, carport, parking pad or the like.
2. Drive Aisle - A drive aisle is located entirely on private property. It is for every other condition other than for a single-family or a duplex property. It connects a drive approach to an area(s) that is to be accessed on the site such as, but not limited to: parking space(s); loading dock(s); loading area(s) (marked or implied - for passengers and/or goods); porte-cochere(s), and/or the like. It can also be a ~~fire lane~~fire apparatus access road (in and of itself or in conjunction with other access use[s]). It can also be an access to an adjoining property (in and of itself or in conjunction with other access use[s]).
3. Drive Approach - A drive approach connects a street (city, public or private) or highway (TxDOT) with a drive aisle. Some features of the drive approach may extend into and be a part of the driveway or drive aisle. The drive approach is measured from the face of the roadway curb to the end of the curb return radius on the private property. The following provides the types of drive approaches considered within this Manual:
    a. Single-family residential: A drive approach to a single-family residential lot or one lot duplex.

b. Multifamily residential: A drive approach to a multifamily lot such as triplexes, fourplexes, and multi-complexes. The drive approach can be either the main entrance approach or the secondary entrance approach. Each type has specific design requirements.

c. Commercial: A drive approach to a commercial development. The drive approach can be either the main entrance approach or the secondary entrance approach. Each type has specific design requirements.

d. Industrial: A drive approach to an industrial development. The drive approach can be either the main entrance approach or the secondary entrance approach. Each type has specific design requirements.

e. Mixed-use approach: A drive approach that is a mixed-use development shall consider the more stringent criteria for the approach design.

4. Flag Drives - A flag drive is a private road within a private access easement, which may serve up to three (3) residential dwelling units. Flag drives shall have direct access to a public street other than an alley. They shall not, however, provide direct access to an arterial street.

C. Cul-De-Sacs, Dead-End Street, and Hammerhead Turnarounds

~~A Cul-De-Sac is a dead-end street that has a fire-accessible turnaround at the end of the street. A half Cul-De-Sac is a street bend at 90±5 degrees for residential and collector streets. Dead-end streets and cul-de-sac should be avoided if possible to enhance street connectivity.~~A cul-de-sac is a form of dead-end street that terminates with a circular or bulb-shaped turnaround, designed to accommodate fire apparatus and

~~ther~~ large vehicles for safe and efficient maneuvering.

A half cul-de-sac incorporates a 90° ± 5° bend, typically applied to residential or residential collector streets, and provides limited turnaround capability. In contrast, traditional dead-end streets share similar geometric characteristics with cul-de-sacs but terminate abruptly without a defined turnaround, restricting emergency access and vehicular circulation.

Hammerhead turnarounds are configured in a T-shaped or L-shaped layout at the end of a dead-end street, providing adequate space for large vehicles to complete a three-point turn. This option is commonly applied in constrained sites where a full cul-de-sac is not feasible.

To support overall street connectivity and circulation, the use of cul-de-sacs, dead-end streets and hammerhead turnarounds should be ~~minimized whenever practicable~~ avoided if possible. ~~For detailed design guidance, refer to Section 5.5.3 (Cul-de-Sac) and Section 5.5.4 (Hammerhead Turnarounds) of this manual.~~

5.3 Roadway Design

5.3.1 Design Controls

Traffic volumes and speed are necessary for the design of roadways, and assist with the planning and design of ROW, number of lanes, turn-lanes, need of intersections, and bicycle and pedestrian facilities. Guidance on these design controls will be discussed at the pre-design meeting.

5.3.2 Street Sections

Street section standards are provided for arterial, collector, and local streets in ~~Table 5.3-A~~ below. Refer to the City of Denton Standard Details for cross-section details. Options for street sections are dependent upon treatment utilization within the street section. Besides defined lanes, other treatments that can be utilized within the street sections include on-street parking, bike lanes, multi-use paths, and transit facilities. The intent is to provide options in order to develop a "complete street" with "context-sensitive" design; *See* Section 5.11 of this Manual. ROW requirements may vary at intersections based upon turning movement requirements.

Field Code Changed

In general, street grades shall follow the natural contour of the property and be below the existing grade so that the parkway drains towards the street. Excessive cuts and fills solely for the purpose of balancing earthwork are not permitted.

Table 5.3-A : Geometric Roadway Standards

Criteria	Roadway Classification									
	FREEWAY	PRIMARY ARTERIAL	SECONDARY ARTERIAL	SECONDARY ARTERIAL (ONE-WAY)	MAJOR COLLECTOR	COMMERCIAL COLLECTOR	RESIDENTIAL COLLECTOR	RESIDENTIAL	RURAL OR SUBURBAN RESIDENTIAL	ALLEY [6,7]
No. of Lanes [1]	As per TxDOT standards	6	4	2-3	3-4	3	2-3	2	2	2
Min. ROW [10]		135′	110′	~~Refer to note [12]~~65′	110′	65′	65′	55′	65′	20′
Pavement Width [2] (BOC to BOC)		84′	62′	~~Refer to note [12]~~35′	48′-72′	39′	39′	33′	21′ [5]	15′ [5]
Median Width		14′	14′	NA	0′-14′	NA	NA	NA	NA	NA
Parkway Width		25.5′	24′	~~Refer to note [12]~~15′	18′-31′	13′	13′	11′	20′	NA
Min. Center Line Radius [3]		750′	575′	575′	575′	575′	400′	200′	200′	100′
Min. Horizontal Curve Separation		100′	100′	100′	100′	100′	100′	NA	NA	NA
Min. Grade (%)		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Max. Grade [4] (%)		7	7	7	7	7	7	10	10	8
Design Speed (MPH)		40-45	35-40	30-35	30-35	30-35	30	30	30	10-15
On-street Parking		Prohibited	Prohibited	Permitted [8]	Prohibited [9]	Prohibited	Permitted [8]	Permitted [8]	Prohibited	Prohibited

Notes:

[1] The number of travel lanes is dependent upon TIA and/or the City's Engineer's requirements.

[2] *See* ~~Table 5.4-D~~, Table 5.4-G ~~Table 5.4-E~~, and Table 5.4-H ~~Table 5.4-F~~ for additional ROW requirements at intersections with turn lanes.

[3] The Minimum center line radius is based on the cross slope of -2% (no superelevation).

[4] The maximum grade within 60 feet of an intersection measured from the intersection curb is 2% or less.

[5] Measurement is edge-of-pavement to edge-of-pavement.

[6] If an alley is to be used for waste collection, it must meet all alleyway access requirements shown in Section 3: Solid Waste Design Criteria of this Manual.

[7] If an alley is intended to provide fire apparatus access, it must meet the design requirements of Section 5.6.3- Fire Apparatus Access Roads of this Manual.

[8] Parking is allowed unless otherwise prohibited by ordinance or by signs installed by the city.

[9] Parking is prohibited unless otherwise allowed by ordinance or by the City's Engineer, in which case only parallel parking is permitted.

[10] The developer shall dedicate from one-half of the required ROW~~right-of-way~~, measured from the centerline of the existing street alignment, up to the full width of the required ROW~~right-of-way~~ for City-maintained facilities, in accordance with the City of Denton Mobility Plan.

[11] A 20-ft wide public utility easement is required along the property frontage where the property abuts a TxDOT-maintained roadway.

[12] The applicable standards, cross-sections, and design requirements shall be determined in coordination with the City Transportation Department~~ivision~~.

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Table 5.3-A: Geometric Roadway Standards							
Roadway Classification	No. of Lanes [1]	Min. ROW (feet)	Min. B-B Width [2] (feet)	Min. Center Line Radius [3] (feet)	Min. Horizontal Curve Separation (feet)	Min. Grade (%)	Max. Grade [4] (%)
Freeway	As per TxDOT standards						
Primary Arterial	6	135	104	750	100	0.5	7
Primary Arterial – Modified	6	135	88	750	100	0.5	7
Secondary Arterial	4	110	80	575	100	0.5	7
Secondary Arterial – Modified	4	110	67	575	100	0.5	7
Collector – Commercial	2	65	39	575	100	0.5	7
Collector – Residential	2	65	39	400	100	0.5	7
Local – Residential	2	55	33	200	0	0.5	10
Local – Rural	2	65	25 [5]	200	0	0.5	10
Local – Alley [6]	1	20	15 [5]	100	0	0.5	8

Notes:

[1] Number of travel lanes dependent upon TIA and/or City's Engineer's requirements.

[2] *See* Table 5.4-D, Table 5.4-E, and Table 5.4-F for additional ROW requirements at intersections with turn lanes.

[3] Minimum center line radius based on cross slope of -2% (no super elevation).

[4] Maximum grade within 60 feet of an intersection measured from the intersection curb is 2% or less.

[5] Measurement is edge-of-pavement to edge-of-pavement.

[6] If an alley is to be used for waste collection, then it must meet all alleyway access requirements shown in Section 3: Solid Waste Design Criteria of this Manual.

5.4 Intersection Design

Several components of intersection design are addressed in this section. These standards are to work in concert with the Traffic Impact Analysis (TIA) requirements of this Manual. Additionally, the Pedestrian and Bicycle Facility Design, Transit Facility Design, and the City of Denton Standard drawings for accessibility should be reviewed for additional design requirements.

5.4.1 Geometry

A. Street intersections should be designed to be perpendicular; *see* tolerances shown in Table 5.4-A below. All streets shall be aligned with any existing streets by continuation of the centerline thereof.

B. The staggering of street alignment resulting in "T" intersections shall leave a minimum distance of 150 feet between the curb faces ~~centerlines~~ of residential streets, and 200 feet between the curb faces ~~centerline~~ of collector streets.

C. Table 5.4-A and Figure 5.1 below provide requirements for ROW corner clips and curb return radius at intersections. These standards provide minimum vision clearance areas without consideration to stopping sight distance. Additional sight clearance evaluation should be performed as necessary, as per Section 5.4.3 below.

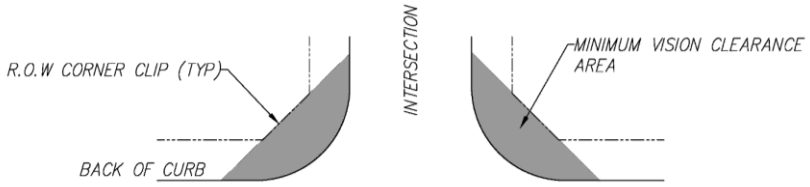

Figure 5.1 Minimum Vision Clearance

Table 5.4-A: Intersection Geometry

Intersection Classification	Intersection Angle (degrees)	ROW Corner Clip [1] (feet)	Curb Return Radius (feet)
Arterial - Arterial	90±5	30	30
Collector - Arterial	90±5	20	30
Collector - Collector	90±5	15	30
Residential Street - Arterial	90±5	15	30
Residential Street - Collector	90±10	15	20
Residential Street - Residential Street	90±10	10	20
Flag Drive - Collector	90±10	5	20
Flag Drive - Residential Street	90±15	5	10
Alley - Collector	90±10	10	30
Alley - Residential Street	90±10	15	30
Alley - Alley	90±10	25	30

Notes:
[1] Shall apply to all corners of the intersection.
[2] Fences must provide a 5-ft. corner clip adjacent to driveways.
[3] Curb Return Radius is for single lane design. Multi-lane and special considerations for truck-turning radius require turn radius analysis, as required by the City's Engineer.
[4] Major Collector shall follow the arterial street standard.

5.4.2 Visibility Standards

Table 5.4-B and Figure 5.2 below shall be used to evaluate the required unobstructed view for motorists at intersections, which are based upon the design speed approaching the intersection. Design speeds are based upon the roadway classification. The values shown in the table are minimum standards. Within the sight line area, no obstruction shall be allowed that will obstruct the view of motorists. A sight visibility easement shall be dedicated to protect and maintain sight visibility.

A. Table 5.4-B below is based upon passenger car right turn and left turn from stop. Where truck traffic warrants additional sight distance, refer to AASHTO Geometric Design of Highways and Streets for single-unit truck and combination truck design requirements, Case B1 and Case B2.

B. Refer to AASHTO Geometric Design of Highways and Streets for multi-lane considerations and other design considerations that may apply for Cases "A" through "F".

C. Lines of sight distance at all intersections shall be clear at an elevation between two (2) feet and

nine (9) feet above the nearest gutter elevation.

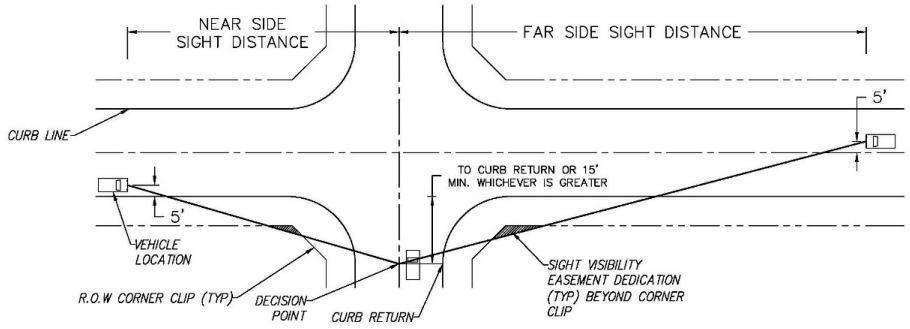

Figure 5.2 Visibility Standards

Table 5.4-B: Visibility Standards		
Design Speed (mph)	**Intersection Sight Distance Near Side (feet)**	**Intersection Sight Distance ~~Far~~Near Side (feet)**
30	290	335
35	335	390
40	385	445
45	430	500

Notes:
[1] Driveways accessing roadways shall use above table to satisfy intersection visibility compliance.

5.4.3 Vertical Curve Standards

Vertical curves are required when two (2) street grades intersect at a point of vertical intersection greater than 1%. Minimum vertical lengths for both crests or sags shall be defined by the design speed for the street and the associated stopping sight distance, as well as the minimum K value. Table 5.4-C below shows the minimum K value for various design speeds.

Table 5.4-C: Minimum 'K' Values for Vertical Curves			
Design Speed (mph)	**Stopping Sight Distance (feet)**	**Crest Vertical Curve (K Min)**	**SAG Vertical Curve (K Min)**
30	200	19	37
35	250	29	49
40	305	44	64
45	360	61	79

Notes:
[1] Source: AASHTO Geometric Design of Highways and Streets 'US Greenbook'.

Vertical curve lengths can be calculated as shown in Equation 5.1 below:

L = KA **[Eqn. 5.1]**

Where: L = Vertical Curve Length

A = Algebraic Difference in Grade

A. No vertical curve required for "A" equal to or less than 1.0%

B. Minimum spacing between successive vertical curves shall be 50 feet for residential, and 100 feet for collectors and arterials.

C. Resultant vertical curve grade shall be no less than 0.3% for concrete pavement, and no less than 0.5% for asphalt pavement.

D. For drainage purposes, 50-ft. vertical curves are required when "A" is greater than 1.0% and less than or equal to 1.2%. Otherwise minimum vertical curve length is 100 feet.

5.4.4 Turn Lane Requirements

Turning lane requirements shall be based upon the following requirements and/or the requirements of the City's Engineer, and the tables within this section.

A. Left-Turn Lane Warrants

When designing an intersection that provides direct or indirect access to the proposed development, left-turn lanes should be provided at driveways and street intersections along major arterial and collector roads, wherever left turns are permitted. Traffic-volume-based guidelines for where left-turn lanes should be provided are presented in :

Tables 5.4-D (~~for~~ four-lane roadways) and

~~Table~~ 5.4-E ~~for~~ (two-lane roadways) below.

~~Table 5.4-D below provides criteria which warrant left-turn lanes. Figure 5.3 below provides guidance on left-turn lane requirements.~~

~~Conditions for requesting a left-turn lane include large truck volume, high crash history, limited sight distance, and significant delay for motorists to make the turn, as determined by the City's Engineer.~~

Table 5.4-D: Left-Turn Warrants for Four-Lane Roadways [1]

Source: AASHTO A Policy on Geometric Design of Highways and Streets

Left-Turn Lane Peak-Hour Volume (veh/hr)	~~Three-Leg Intersection,~~ Arterial/Collector Volume (vehicles per hour per lane) ~~that Warrants a Left-Turn Lane~~ Three-Leg Intersection, Major-Road Peak-Hour Volume (veh/hr/ln) that Warrants a Left-Turn Lane	~~Four-Leg Intersection,~~ Arterial/Collector Volume (vehicles per hour per lane) ~~that Warrants a Left-Turn Lane~~ Four-Leg Intersection, Major-Road Peak-Hour Volume (veh/hr/ln) that Warrants a Left-Turn Lane
5	450	50
10	300	50
15	250	50

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20	200	50
25	200	50
30	150	50
35	150	50
40	150	50
45	150	<50
50 or More	100	<50

Notes:
[1] These guidelines apply where the major road is uncontrolled, and the minor-road approaches are stop- or yield-controlled. Both the left-turn peak-hour volume and the major-road volume warrants should be met as shown in Figure 5.X.
[2] Major road volume shall be calculated as the total traffic volume from both approaches of the major roadway, divided by the total number of through lanes on those approaches.

Table 5.4-E: Left-Turn Warrants for Two-Lane Roadways [1]

Source: AASHTO A Policy on Geometric Design of Highways and Streets

Left-Turn Lane Peak-Hour Volume (veh/hr)	Three-Leg Intersection, Major-Road Peak-Hour Volume (veh/hr/ln) that Warrants a Left-Turn Lane	Four-Leg Intersection, Major-Road Peak-Hour Volume (veh/hr/ln) that Warrants a Left-Turn Lane
5	200	150
10	100	50
15	100	50
20 or more	50	< 50

Notes:
[1] These guidelines apply where the major road is uncontrolled, and the minor-road approaches are stop- or yield-controlled. Both the left-turn peak-hour volume and the major-road volume warrants should be met.
[2] Major road volume shall be calculated as the total traffic volume from both approaches of the major roadway, divided by the total number of through lanes on those approaches.
[3] Bypass lanes warrant analysis at three-leg rural intersections shall follow the TxDOT Roadway Design Manual.

~~**Table 5.4-D: Left-Turn Warrants for Urban and Suburban Roadways**~~

~~Left – Turn Lane Peak Hour Volume (vehicles per hour)~~	~~Three-Leg Intersection, Arterial/Collector Volume (vehicles per hour per lane) that Warrants a Left-Turn Lane~~	~~Four-Leg Intersection, Arterial/Collector Volume (vehicles per hour per lane) that Warrants a Left-Turn Lane~~
~~5~~	~~450~~	~~50~~
~~10~~	~~300~~	~~50~~
~~15~~	~~250~~	~~50~~
~~20~~	~~200~~	~~50~~
~~25~~	~~200~~	~~50~~
~~30~~	~~150~~	~~50~~
~~35~~	~~150~~	~~50~~
~~40~~	~~150~~	~~50~~
~~45~~	~~150~~	~~<50~~

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~~50 or More~~	~~100~~	~~<50~~

Figure 5.3 below guides the left-turn lane ~~requirements~~ design plan. Conditions for requesting a left-turn lane include large truck volume, high crash history, limited sight distance, and significant delay for motorists to make the turn, as determined by the City's Engineer. Further discussion and examples of left-turn lane guidance can be found in AASHTO's Policy on Geometric Design of Highways and Streets.

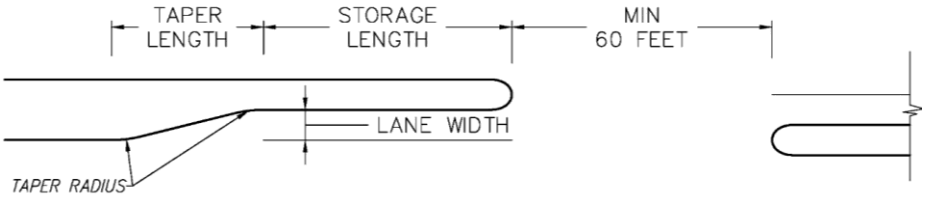

Figure 5.3 Left-Turn Lane

B. Right-Turn Lane Warrants

When designing an intersection that provides direct or indirect access to the proposed development, right-turn lanes should be provided along major arterial and collector roads at driveways when the right turns are permitted and satisfy the following criteria. Table 5.4- ~~G~~E below provides criteria which warrant right-turn lanes. Figure 5.4 below provides guidance on right-turn lane requirements.

Table 5.4- G: Right-Turn Warrants for Urban and Suburban Roadways

Roadway Classification	Speed Limit (mph)	Volume (Vehicles per Hour)
Arterial / Collector	45 or greater	50 or more
Arterial / Collector	Less than 45	60 or more

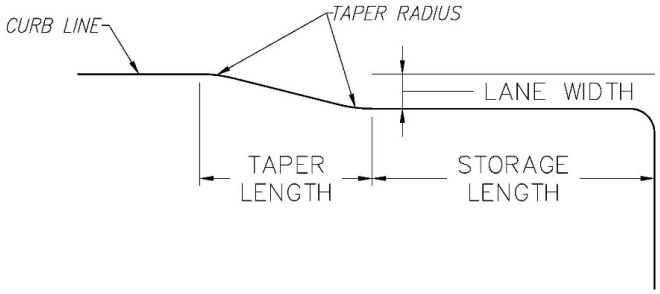

Figure 5.4 Right-Turn Lane

Conditions for requesting an exclusive right-turn lane when right-turn traffic volume projections

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are less than indicated in Table 5.4-~~G~~H, include the following, as determined by the City's Engineer:

1. Large volume of truck traffic,
2. High crash history,
3. Roadways with limited sight distance, or
4. Heavier than normal peak flow movements on the main roadway.

C. Turn Lane Geometry

When a turn lane is required, Table 5.4-~~H~~G below shall be used as the minimum criteria for the turn lane geometry. Additional consideration shall be given for unique traffic movements such as excessive tractor trailer utilization, extended length transport vehicle movement, etc. *See* Section 5.4.5 ~~*see* Section 5.4.5~~ below for additional geometry standards for Collectors and Arterials.

Table 5.4-~~H~~G: Minimum Turn Lane Geometry

Intersection Type	Lane Width (feet)	Minimum Storage Length (feet)	Minimum Taper (feet)		Additional ROW Required (feet)
			LEFT TURN	RIGHT TURN	
Residential Collector	11	100	100	100	15
Major/Commercial/Industrial Collector	11	150	100	150	15
Secondary Arterial	11	150	100	200	15
Primary Arterial	11	200	100	200	15

Notes:
[1] Required turn lane storage may be greater depending upon the TIA.
[2] The Pedestrian Path shall be taken into account for access across the median by utilizing a leave-out or ramp in accordance with accessibility standards described in this manual.
[3] Cross slope of median openings or turn bays shall not be more than 2% or less than 1%.
[4] On TxDOT Roadways, TxDOT Roadway Design Manual standards shall supersede City of Denton Standards.
[5] Taper Radius shall be 200 feet minimum.
[6] Additional ROW required per turn lane bay, if ROW is not sufficient.

5.4.5 Intersection Detail for Collectors and Arterials

Figure 5.5 below provides median location details and specific turn lane radius requirements. Also refer to median details shown in the City of Denton Standard Details.

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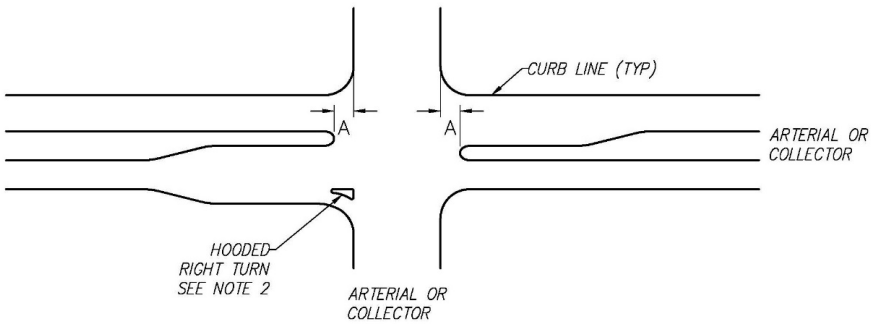

Figure 5.5 Intersection Detail for Collectors and Arterials

Notes:

1. For collector and arterial streets, A = 15 feet minimum.
2. Depending upon traffic flow requirements, the right turn may require a hooded right turn.

5.4.6 Intersection Spacing

Standards for intersection spacing are outlined below in Table 5.4-~~I. G.~~

Table 5.4~~-I. -G.~~ Minimum Intersection Spacing [1]

Roadway Classification	Alley	Flag Drive	Residential	Collector	Arterial
Alley	100 feet	N/A	100 feet	100 feet	N/A
Flag drive	N/A	N/A	75 feet	75 feet	N/A
Residential	100 feet	75 feet	200 feet [2]	200 feet [2]	400 feet
Collector	100 feet	75 feet	200 feet [2]	200 feet [2]	400 feet
Arterial	N/A	N/A	400 feet	400 feet	1200 feet

Notes:
[1] Spacing will be measured between face of the curbs.
[2] 100-ft. minimum to the first intersection for entrances to subdivisions off of an arterial, where lots back up to the arterial.

5.4.7 Roundabouts

Roundabouts are circular intersections that create counter-clockwise traffic movements around a central island, with entering traffic yielding to circulating traffic.

The design of a roundabout shall be in compliance with the Intersection Control Evaluation provided by the FHWA. Normally, each roundabout will be unique in some way, as such a standard roundabout is not included in this Manual. Also, the various analyses and design considerations involved in roundabout design are beyond the scope of this Manual.

A. The following resources shall be used when designing a roundabout:

1. TxDOT Roadway Design Manual
2. ~~NCHRP Report 672 - Roundabouts: An Information Guide, Second Edition (2010)~~
3. ~~NCHRP Report 1043: Guide for Roundabouts (2023)~~ ~~NCHRP Report 745 - Left-Turn Accommodations at Unsignalized Intersections (2013)~~
2.
4. ~~TxDOT Auxiliary Lane requirements for right turn lane~~
5. ~~3.~~ Federal Highway Administration Roundabouts, An Information Guide
6. ~~4.~~ Federal Highway Administration Roundabouts, Technical Summary

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B. In addition to the resources provided above, the roundabout design shall include the following design review process with the City's Engineer and City Staff:
   1. Have a Pre-Application Conference on the project, which will include a separate meeting with the City's Engineer for proposed roundabout design considerations;
   2. Have a Traffic Impact Analysis (TIA) review meeting with the City's Engineer. *See* section on TIA requirements;
   3. Develop Preliminary layout of roundabout considering TIA and Pre-Development meetings;
   4. Preliminary Design review meeting with the City's Engineer;
   5. Develop roundabout design based up comments from the City's Engineer; and
   6. Submit roundabout design through the Development Review Process (DRP).

5.5 Auxiliary Roadway Design

5.5.1 Alleys

A. Alleys shall have at least two (2) direct access points to public streets and are subject to the block length criteria included in this Manual.

B. Alleys shall be a minimum of 15 feet wide, with edges sloping towards the centerline at 3% slope.

C. No drainage infrastructure will be allowed within the alley ROW. Alleys shall be designed to convey all runoff along the surface of the pavement.

D. Alleys that are intended to provide fire apparatus access must meet the design requirements of Section 5.6.3-Fire Apparatus Access Roads ~~Section 5.6.3 Fire Apparatus Access Roads~~ of this Manual.

E. Refer to City of Denton Standard Detail T103C for further details.

5.5.2 Drives

The design criteria for drives detailed in this section should be utilized in conjunction with the standards

outlined in DDC 8.3 (Lot Planning). The following standards generally apply to all developments. However, there may be unique situations for which these standards may be impractical. In these situations, the City's Engineer will work with the developer to develop a mutually agreeable solution. In the event that a mutually agreeable solution is not reached, the developer may apply to the Planning and Zoning Commission for consideration of the issue.

A. Drive Approach Standards

Table 5.5-A: Drive Approach Dimensions

Development Type [1]	Drive Approach Widths		Radius
	MIN. WIDTH (FEET)	MAX. WIDTH [2] (FEET)	(FEET)
Residential – Single-family or Duplex	12	20	5 [3]
Residential – Multifamily	24	38	10 to 20
Commercial or Industrial [4]	30	38	20 to 25

Notes:
[1] Driveways on TxDOT roadways - driveway width and curb radius shall meet TxDOT Roadway Design Manual standards.
[2] Refer to Figures 5.6 through 5.10.
[3] If the drive approach is part of the fire apparatus access road, refer to Section 5.6.3 of this manual.
[4~~2~~] Maximum drive approach width is a function of traffic volume.
[5~~3~~] Add five (5) feet to maximum radius for significant truck traffic.
[6~~4~~] For shared drive approaches, no lot shall contain less than nine (9) feet of the drive approach and driveway or drive aisle (as may apply). Drive approach shall be centered on lot line, such that maximum drive approach width equals 30 feet.

1. Residential

   a. One (1) single-family or one (1) duplex residential lot accessing a collector may be permitted to have one (1) full-width or circular drive approach (Figure 5.6 below), when alleys are not practical.

   b. Two (2) adjacent single-family or two (2) adjacent duplex residential lots accessing a collector may be permitted to have one (1) shared full-width or circular drive approach, when alleys are not practical.

   c. Three (3) or more contiguous single-family or three (3) or more contiguous duplex residential lots accessing a collector will be required to enter the collector by an alley, flag drive, or residential street.

   d. One (1) single-family or one (1) duplex residential lot accessing an arterial, will be required to have an on-site facility, allowing entrance into the arterial in a forward manner.

   e. For homes with a 3-car garage or greater, where the garage door is street-facing and less than 40 feet from the back of curb, the maximum drive approach width shall be 30 feet.

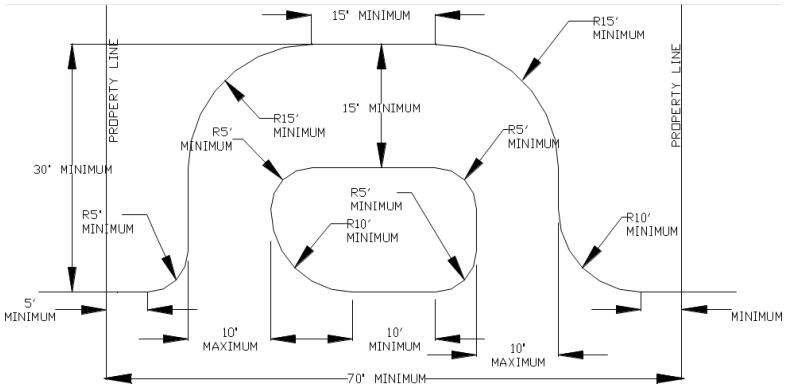

Figure 5.6 Residential Circular Drives

2. Commercial

   a. All stop bar markings and stop signs when used shall be on private property, as well as upstream of any pedestrian facility crossing the drive approach and/or drive aisle.

   b. All signs and markings should be consistent with TMUTCD.

   c. Drive approaches with significant truck traffic may install surmountable curb with textured and colored pavement in the parkway, with a depth equal to or greater than the drive approach pavement requirement.

   d. Ingress/Egress Lanes

      i. Single Lane Egress/Ingress (Figure 5.7) - The outbound (towards the street) lane shall be a minimum of 12 feet wide; if the width of the driveway is greater than 30 feet, then the inbound (onto the site) lane shall be a minimum of 18 feet wide.

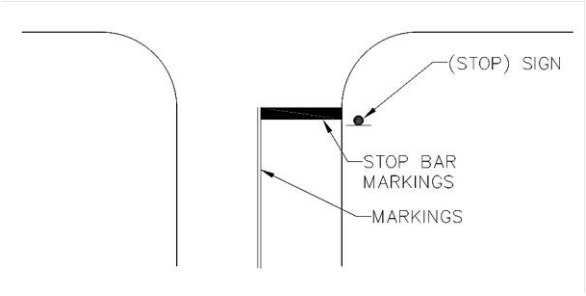

Figure 5.7 Drive Approach: Single Lane Egress/Ingress

      ii. Dual Lane Egress, Single Lane Ingress (Figure 5.8) - The outbound lanes shall be 10 feet wide; if the width of the driveway is greater than 30 feet, then outbound lanes shall remain 10 feet wide while the width of the inbound lane shall be increased.

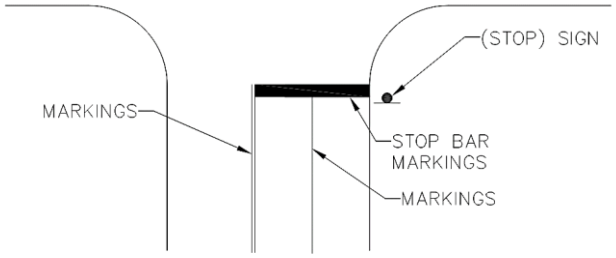

Figure 5.8 Drive Approach – Dual Lane Egress, Single Lane Ingress

iii. Multiple Lane Egress/Ingress (Figure 5.9) - Only allowed when dual left-turn lanes into the site or opposing street/driveway has two (2) or more lanes, of which two (2) are designated as being through lanes.

~~a)~~d) Each of the two (2) outbound and inbound lanes shall be 10 to 12 feet wide.
~~b)~~e) Median shall accommodate any pedestrian facility across the drive approach and/or drive aisle, as projected from both sides thereof.

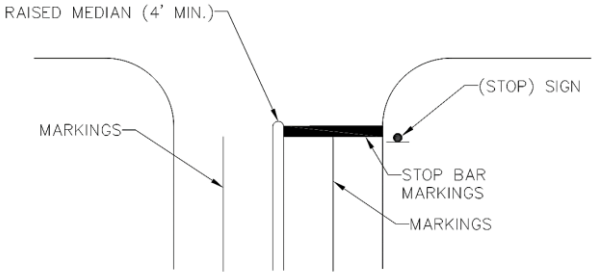

Figure 5.9 Drive Approach – Multiple Lane Egress/Ingress

iv. Right-in or Right-out Egress/Ingress - The minimum width of the drive approach/drive aisle prior to the island, each lane (inbound and outbound) at the island, and the applicable radii shall be determined by the engineer of record, based on expected vehicle type(s), as well as an auto-turn analysis provided to the City's Engineer for review and approval as part of the Civil Engineering Plan submittal.

a) Median/island shall accommodate any pedestrian facility across the drive approach and/or drive aisle as projected from both sides thereof.
b) For "one way in" or "one way out" driveways, the geometry shall be as shown in Figure 5.10 below for the respective side.
c) Through a Design Deviation request, the minimum drive approach width may be reduced based upon acceptable turning radius for emergency vehicles, and determination that truck traffic requiring the larger width will not occur.

d) When the right in/right out drive approach is part of the fire apparatus access road, the minimum width of each drive shall be 24 feet.

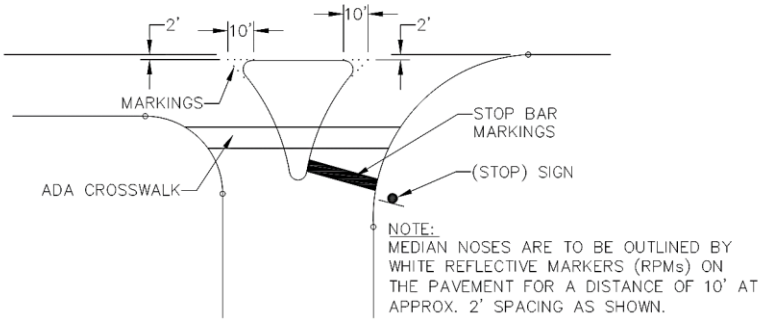

Figure 5.10 Drive Approach – Right in or Right out Egress/Ingress

v. With the exception of multi-lane egress/ingress (shown in Figure 5.9~~Figure 5.9~~), drive approaches with a median installed in lieu of the double-yellow marking, may exceed the maximum drive approach width by the width of the median only.

~~v.~~vi. Right-in/right-out driveways along TxDOT frontage roads may be designed without a porkchop unless the driveway is in close proximity to exit and entrance ramps. A regular driveway approach with one-way signs is acceptable

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B. Drive Approach Spacing

1. Same side of the street

Drive approach spacing shown in Table 5.5-B below applies to drive approaches on the same side of the street, and is measured between the nearest edges of each drive approach, along the back of curb, not including the radius.

Table 5.5-B: Minimum Drive Approach Spacing

Roadway Classification	Min. Spacing [1] (feet)
Primary Arterial	200 [2]
Secondary Arterial	150 [2]
Major Collector/Collector	100 [3]
Residential Street [4]	50~~10~~
Flag Drive	10
Alley	10

Notes:
[1] Driveways on TxDOT roadways must meet the minimum spacing in the TxDOT Access Management Manual, Table 2-2.
[2] A ~~M~~maximum of two (2) drive approaches permitted. If a seco~~2~~nd point of access is required by Ccity Ffire Code official~~division~~, it must be remote, meaning driveways are spaced no less than half the diagonal of the maximum overall dimension of the lot.
[3~~2~~] If permitted; drive approaches are not permitted on arterial streets, unless otherwise allowed according to Section 5.6 of this Manual.

[43] If permitted; refer to Section 5.6 of this Manual for permitted access.
[54] For a T-intersection on residential streets, the drive approach shall be offset farthest from the intersection.
[6] Single-family driveways on residential streets require a minimum spacing of 10 ft.

2. Near Intersections

Drive Approach spacing shown in Table 5.5-C below applies to drive approaches near ~~intersections, and~~intersections and is measured between the face of the curb of the intersecting street and the nearest edge (face of curb) of the drive approach not including the drive approach radius; *see* Figure 5.11 below.

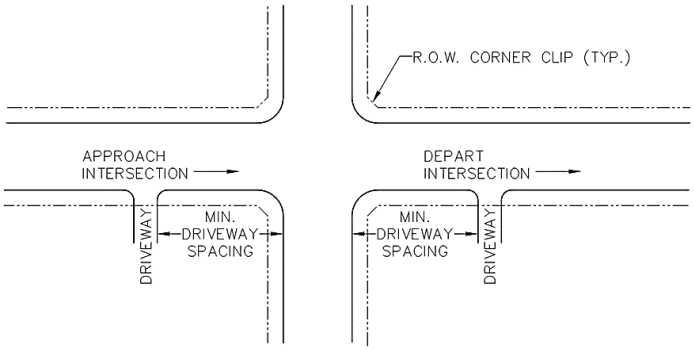

Figure 5.11 Drive Approach Spacing at Intersections

Table 5.5-C: Minimum Drive Approach Spacing at Intersections

Intersection Type	Approaching the Intersection	Departing the Intersection
Arterial - Arterial [1]	150 feet on both streets	200 feet on both streets
Collector - Arterial [1]	75 feet on collector, 150 feet on arterial	100 feet on collector, 200 feet on arterial
Collector - Collector	75 feet on both streets	100 feet on both streets
Residential - Arterial [1]	50 feet on residential, 150 feet on arterial	50 feet on residential, 200 feet on arterial
Residential - Collector	50 feet on residential, 75 on feet collector	50 feet on residential, 100 feet on collector
Residential - Residential [2]	50 feet on both streets	50 feet on both streets
Flag Drive - Collector [1]	20 feet on flag drive, 75 feet on collector	20 feet on flag drive, 100 feet on collector
Flag Drive - Residential [1]	20 feet on flag drive, 50 feet on residential	20 feet on flag drive, 50 feet on residential
Alley - Collector [1]	20 feet on alley, 75 feet on collector	20 feet on alley, 100 feet on collector
Alley - Residential [1]	20 feet on alley, 50 feet on residential	20 feet on alley, 50 feet on residential
Alley - Alley	10 feet on both alleys	10 feet on both alleys

Notes:
[1] If permitted by the City's Engineer.
[2] Driveways across T-intersections on residential streets are exempt.

3. Offset and relative to median openings (See Figures 5.12 and 5.13 below)

   a. For collector streets, drive approaches that do not align across the street from each other must be offset by a minimum of 75 feet between nearest tangent-edge to nearest tangent-edge.

   b. For arterial streets without medians, drive approaches must align across the street from each other, and must be approved by the City's Engineer. When this is not physically possible or practical as determined by the City's Engineer, drive approaches that do not align must be offset across the street from each other by a minimum of 150 feet between nearest tangent-edge to nearest tangent-edge.

   c. For arterial streets with medians, drive approaches must align with existing or proposed median openings. Where this is not possible or practical as determined by the City's Engineer, drive approaches must be placed as far away from the existing or proposed median opening as is reasonably possible.

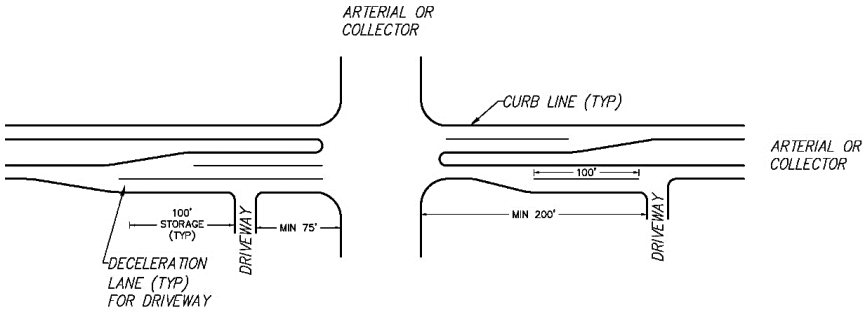

Figure 5.12 Drive Approach Near Turning Movements

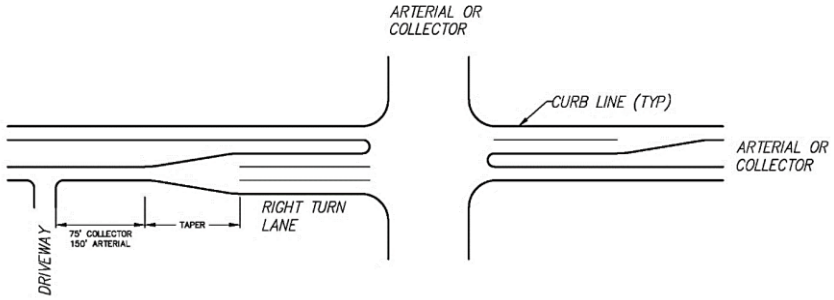

Figure 5.13 Drive Approach Near Turning Movements

C. Drive Approach Grades

1. Minimum Drive Approach Slope:

The minimum drive approach slope shall be determined by:

S = (6 + [0.02 x W x 12]) / (W x 12) **[Eqn. 5.2]**

Where: W = the width of the parkway in feet as shown on the City of Denton Standard Details.

2. Maximum Drive Approach Slope: Unless otherwise approved by the City's Engineer through a design deviation request (Section 8), the maximum drive approach slope shall be 12%.

3. Difference in Drive Approach Grade: Driveway profiles shall not have a grade difference greater than 5%, without constructing a vertical curve. A minimum K-value of 4 is recommended for driveways accommodating low ground clearance or long wheelbase vehicles.

4. Sidewalks in Drive Approach: Maximum sidewalk cross slope within the limits of the drive approach shall be 2%.

5. Sidewalk Easement Requirement: Where the parkway width is insufficient to provide appropriate drive approach slope, a sidewalk easement will be required, equal to the balance of the sidewalk width needed outside the ROW plus two (2) feet. The additional two (2) feet requirement is for sidewalk installation and maintenance. The balance of the sidewalk width needed is based upon using the minimum drive approach slope calculated in Section 5.5.2.C.1 above. *See* Figure 5.14 below as well as City of Denton Standard Details.

6. Driveway/Drive Aisle Consideration: The drive approach slope from the bottom of the gutter to the nearest edge of the sidewalk (within the limits of the ROW) shall not exceed the driveway/drive aisle slope beginning at the furthermost edge of the sidewalk. Also, it shall not be less than the minimum slope, nor be greater than the maximum slope as noted herein.

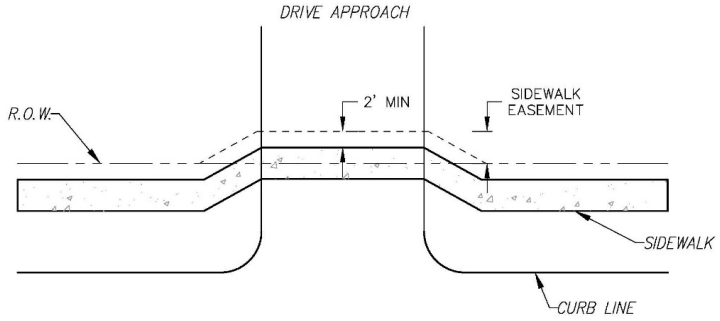

Figure 5.14 Sidewalk Easement to meet Drive Approach Slope

D. Driveway Throat Length Requirements

1. Minimum throat length requirements are shown in Table 5.5-D below. Note that throat length requirement applies to both edges of the drive approach.

2. All drive approaches that access an arterial shall be classified as a primary drive approach. If no drive approaches access an arterial, then the drive approach expected to receive the most traffic is considered to be the primary drive approach.

3. The throat length is measured between the first parking space or drive aisle and the curb line, whichever is closer to the curb line.

4. Parking lots with 10 or less parking spaces may use a minimum throat length of 10 feet for drive approaches accessing a residential or collector street.

4.5. For gated entries, a minimum storage of 100' ~~storag~~ feet~~e~~ must be provided from the travel lane face of the curb with an area for turnaround.

5.6. A ~~Q~~queuing analysis shall be required for gated entrances and drive-throughs.

Table 5.5-D: Minimum Throat Length

No. of Parking Spaces	Min. Throat Length for Primary Drive Aisle (feet)	Min. Throat Length for Secondary Drive Aisle (feet)
0 to 100	20	20
101 to 250	40	20
251 to 500	60	40
501 to 1000	80	60
1001 and above	Queuing Analysis Required	Queuing Analysis Required

E. Driveway Separation

Driveways shall be separated in accordance with Table 5.5-B~~Table 5.5-B~~ to ensure that all driveways are separated by sufficient distance so as to avoid interfering with the safe movement of traffic. In interpreting and applying the separation requirements, the following shall apply:

1. The separation requirements shall be determined in reference to any proposed or existing driveways on or off the property. Where applied to a property, which is located adjacent to an undeveloped tract, the separation requirements shall account for the placement of future driveways on the adjacent undeveloped property.

2. The minimum separation specified may be reduced for currently developed property, if the amount of street frontage for the property is insufficient to allow for one (1) driveway access that would have the necessary separation from an existing driveway on adjacent property, and joint access with adjacent properties is not physically possible, as determined by the City's Engineer. If a reduction in the minimum separation specified is allowed, the separation shall be reduced only to the degree necessary to allow for the single driveway.

F. Corner Clearance Standards

Corner clearance standards shall be applied in accordance with AASHTO "Green book" to ensure that the traffic movements from driveways do not unduly conflict with the movement of traffic on intersecting public streets. In interpreting and applying the corner clearance standards, the following shall apply:

1. A reduced requirement may only be used if absolutely necessary to provide driveway access to property where no other means of access meeting the corner clearance requirement is reasonably possible, and joint access with adjacent properties is not physically possible as determined by the City's Engineer. If a reduction in the minimum corner clearance specified is allowed, the corner clearance shall be reduced only to the degree necessary to allow for the single driveway.

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2. The specified distances shall be measured at the ROW line from the edge of the driveway nearest the intersecting street to the ROW line of the intersecting street. Where ROW corner clips exist or are proposed, the specified distance shall be measured from the edge of the driveway nearest the intersecting street and the end of the corner clip nearest to the subject driveway.

G. Modifications to Existing Drives

Existing non-compliant drives may be modified to comply with criteria set forth in this Manual, but may not be modified in a way that increases the non-compliance with this Manual.

H. TxDOT Drives

All drives connecting to TxDOT roadways shall meet all required TxDOT standards, in addition to meeting City of Denton standards when applicable.

5.5.3 Cul-de-sacs

A. Geometrical Standards

1. Maximum length of a Cul-de-sac shall be 600 feet measured from the centerline of the intersecting street to the Cul-de-sac radius point, and perpendicular to the intersecting street centerline.
2. Minimum length of a Cul-de-sac shall meet Fire Code requirements.
3. Residential Cul-de-sacs shall not have more than 29 residential lots.
4. The center radius of the Cul-de-sac shall be a minimum of 50 feet for residential developments, and 60 feet for commercial and industrial developments measured from the center point to the face of curb or edge of pavement where there is no curb.
5. The Cul-de-sac return radius shall be 30 feet.
6. Cul-de-sac minimum street grades shall be as shown below in Figure 5.15 and Figure 5.16 below for downward gradient and upward gradient, respectively.

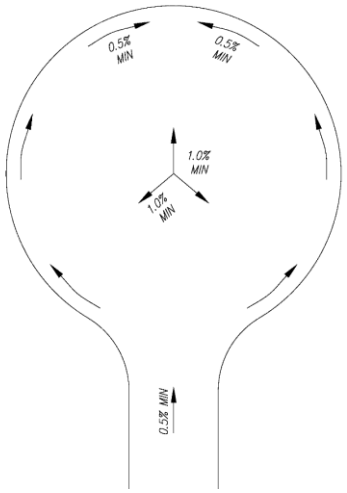


Figure 5.15 Cul-de-sac Minimum Slope - Downward Gradient

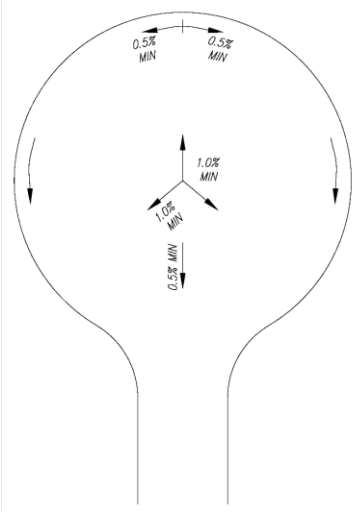


Figure 5.16 Cul-de-sac Minimum Slope - Upward Gradient

B. Offset Cul-de-sacs

1. Offset Cul-de-sacs shall have the same radius and return radius as the standard Cul-de-sac.
2. The length of the offset Cul-de-sac shall be measured from the centerline of the intersecting street to the Cul-de-sac radius point, perpendicular to the intersecting street centerline.

C. Temporary Turn-Around

1. A temporary turn-around shall be limited to approved phase developments where the street will be extended in the future.
2. A temporary turn-around shall meet the requirements of a standard Cul-de-sac for radius and return radius size.
3. The length of street associated with the turn-around shall not be any greater than 600 feet nor less than Fire Code requirements.
4. If the length of street will be greater than 600 feet, then the next block length of street and intersecting streets shall be constructed in order to provide looped traffic flow for emergency vehicles.
5. The turn-around section shall be constructed to the same structural section as the street section less curb and gutter requirements, unless drainage requirements warrant curb and gutter.

5.5.4 Hammerhead Turnarounds

~~F. A hammerhead turnaround is a T-shaped roadway design provided at the end of a dead-end street or fire lane to allow vehicles, especially emergency vehicles, to turn around efficiently. Hammerhead turnarounds are typically used w~~

~~G. ere a full cul-de-sac is not feasible due to site constraints or where minimal right-of-way is available.~~

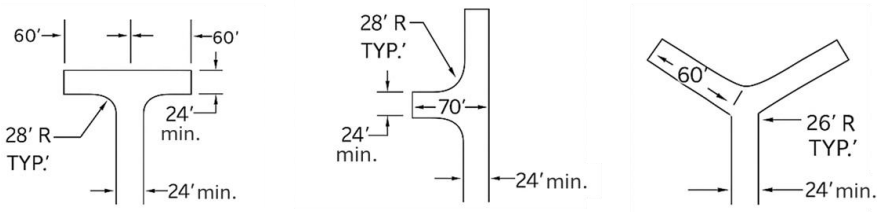
~~H. Design Requirements~~

A. The legs of the hammerhead (forming the "T" shape) should be at least 60 feet in length, measured from the centerline of the intersecting roadway.

B. The turnaround must be constructed to support heavy vehicles and meet ~~any~~all width and corner radius standards required for emergency access.

C. No parking or obstructions are allowed within the hammerhead area to ensure full access for emergency vehicles.

~~Hammerhead turnarounds may also be used for temporary access when full cul-de-sacs cannot be constructed, but permanent installations should meet all city standards for surface, signage, and access restrictions.~~



(a) 120-ft Hammerhead "T" style | (b) 120-ft Hammerhead Alternative | (a) Hammerhead "Y" style

~~Figure 5.17 Hammerhead~~ Turnarounds

Figure 5.1717716 Hammerhead Turnarounds

~~**Design Requirements**~~

~~Hammerhead turnarounds provide a safe and practical alternative to cul-de-sacs in constrained residential developments, while maintaining compliance with fire and emergency vehicle regulations.~~

5.5.5 Supplementary Design Elements

A. Signage and striping

Signage and pavement markings shall be as shown in the Texas Manual on Uniform Traffic Control Devices (TMUTCD).

New subdivisions must include STOP signs on minor street app

roaches and All-Way STOP control (AWSC) where long stretches of Residential, Collector, and Arterial intersections. (Determined by the reviewer or City's Engineer)

1. . The City's ~~Traffic~~ Engineer must approve AWSC signs.
2. Midblock crossings are discouraged; where it's inevitable, it must have LED- Crosswalk Signs, Ped warning, Ped crossing signs, Rectangular Rapid-Flashing Beacons (RRFBs), Pedestrian Hybrid Beacons (PHBs), or other active crossing signs as directed by the City's ~~Traffic~~ Engineer.
3. Crosswalk Markings - Continental style – Two (2) feet' wide by ~~,~~ 10' feet –long white thermoplastic
   a. Crosswalks shall only be installed if there are Barrier-Free Ramps (BFRs) on both ends of the road.
   b. Crosswalks are required only on Collectors and above, not on residential, local streets, or alleys.

~~6.~~4. 'STOP' Bars ~~-~~ 24 inches" white thermoplastic located 2 inches' from the crosswalk or aligned with 'STOP' signs.

B. On-street Parking

Consistent with the requirements of Public Rights of Way Accessibility Guidelines (PROWAG), the following Americans with Disabilities Act (ADA) on-street parking requirements shall be followed:

1. General
   a. On-street parking is permitted for residential and residential collector streets, unless prohibited by the City's Engineer.
   b. On-street parking should be parallel, while angled and perpendicular parking requires approval from the City's Engineer.
   ~~a.~~
   ~~b.~~c. On-street parking for proposed commercial/industrial collectors or arterials is not allowed. Where on-street parking is designated, one (1) on-street parking space for each single-family unit on a block is required on the frontage street within that block.
   ~~c.~~d. Areas in front of a driveway, within five (5) feet of a driveway, within 20 feet of a street intersection, or within 15 feet of a fire hydrant shall not be counted toward the required

on-street parking.

2. Parallel Parking

   a. For parallel parking spaces where the adjacent sidewalk or available ROW is more than 14 feet wide, an access aisle must be provided at street level for the entire length of each accessible parallel parking space.

   b. The access aisle must be a minimum of five (5) feet wide and connect to a pedestrian access route.

   c. The access aisle must not encroach on the vehicular travel lane and must comply with the technical requirements for surfaces.

   d. In alterations where the street or sidewalk adjacent to the parking spaces is not altered, an access aisle is not required, provided the parking spaces are located at the end of the block face.

   e. Where the adjacent sidewalk or available ROW is less than or equal to 14 feet wide, an access aisle is not required, but accessible parallel parking spaces must be located at the end of the block face.

   Figure 5.187 shows the acceptable parking configuration for on-street parallel parking.

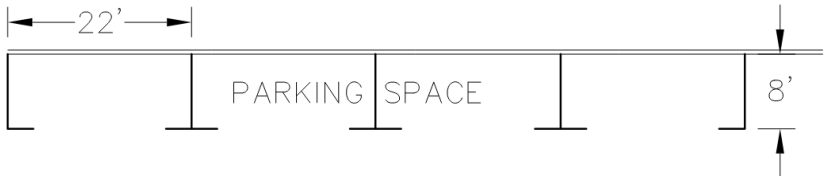


Figure 5.181817 Parallel Parking

3. Perpendicular and Angled Parking

   a. For perpendicular and angled parking spaces, an access aisle must be provided at street level for the entire length of each accessible perpendicular or angled parking space.

   b. The access aisle must be a minimum of eight (8) feet wide to accommodate vans with lifts and connect to a pedestrian access route.

   c. Two (2) accessible parking spaces are permitted to share a common access aisle.

   d. The access aisle must be marked to discourage parking in the aisle and comply with the technical requirements for surfaces.

   Figures 5.198 through 5.221 show the acceptable parking configurations for on-street angled parking.

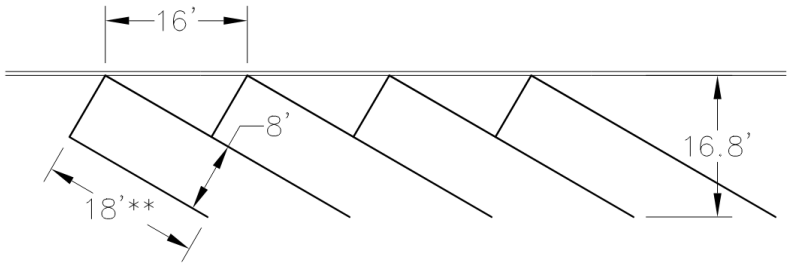


Figure 5.191~~918~~ Angled Parking – 30 degrees

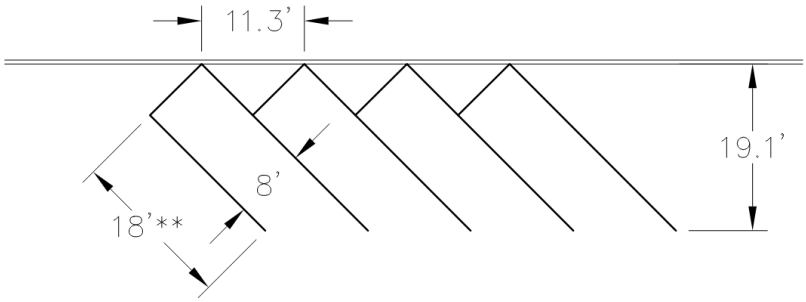


Figure 5.202~~019~~ Angled Parking - 45 degrees

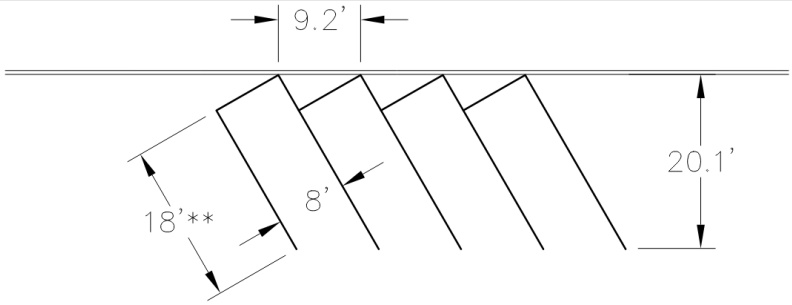


Figure 5.212~~120~~ Angled Parking - 60 degrees

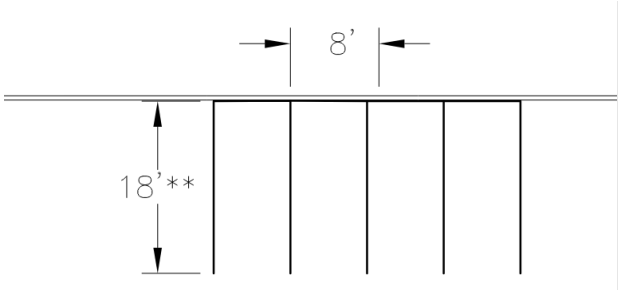


Figure 5.222221 Angled Parking - 90 degrees

4. Curb Ramps and Blended Transitions
    a. Curb ramps and blended transitions must connect the access aisle serving each accessible on-street parking space to the pedestrian access route.
    b. Curb ramps are not permitted within the access aisle.
    c. Parking spaces at the end of block face can be served by curb ramps or blended transitions at the pedestrian street crossing.
    d. Detectable warning surfaces are not required on curb ramps and blended transitions that connect the access aisle to the sidewalk, including where the sidewalk is at the same level as the parking spaces, unless the curb ramps and blended transitions also serve pedestrian street crossings.
5. Other
    a. Wheel stops will be required to prevent vehicle overhang into adjacent property, ROW, structures, landscaping or sidewalk (applicable to '**' shown on above figures).
    b. Parking spaces may be reduced to 16.5 feet in length if a two (2) feet overhang is provided.
    c. All standard parking space striping shall be white in color.
    d. On-street motorcycle parking space is half the size of a vehicle parking space.

C. Median Openings

Median openings for collectors and arterials shall be as designated by the City's Engineer. Median opening allowance shall primarily consider the safety and effective flow of traffic within the collector or arterial street, then secondarily consider the effective movement of traffic to and from the development. Whether a median opening is allowed will solely be up to the City's Engineer.

When a development is allowed to have a median opening, it shall be provided in accordance with the following criteria:

1. The width of a median opening shall be 60 feet.
2. Median openings shall center on the intersecting drive.
3. Median openings shall be a minimum of 400 feet apart, measured from nose-to-nose of medians.

4. Whenever a median opening is constructed, the associated left-turn lane serving the development must be constructed at the same time. In the event that there is an existing intersecting street on the opposite side of the street, the new development constructing the median opening shall be required to install both left-turn lanes.

5. Patterned and colored median noses shall be constructed as shown on the City of Denton Standard Details.

~~5.~~6. For any proposed median opening on TxDOT-maintained facilities, the standards outlined in the TxDOT Roadway Design Manual shall be followed.

D. Traffic Calming

~~Traffic calming with respect to speed-control devices are not permitted on public ROW. Speed humps on private property are prohibited unless approved by City Fire Code official, and shall comply with IFC standards.~~

~~Appropriate signage and pavement markings are to be provided along with all traffic calming devices. Additional ROW may need to be dedicated in order to accomplish adequate traffic calming.~~

~~A separate permit is required for the installation of speed control devices located in a fire lane. These devices shall be constructed of durable rubberized material, molded plastic or of concrete.~~

1. General Policy

   a. Traffic calming measures intended to control vehicle speeds within the public ~~right-of-way (~~ROW~~)~~ are generally not permitted.

   b. Exceptions may be considered in critical areas where documented overspeeding presents a safety hazard ~~- —~~such as in front of schools, hospitals, parks, or other pedestrian-sensitive environments.

   c. Any installation within the public ROW must be supported by an engineering study that documents operating speeds exceeding the posted limit and must receive approval by the City Fire Code Official, ensuring compliance with the most current provisions of the ~~International Fire Code (~~IFC~~)~~ adopted by the City.

2. Prohibited vs. Conditional Devices

   a. Prohibited Devices:

      Speed humps, bumps, and other similar vertical deflection devices are prohibited on both public ROW and private property ~~fire lanes~~fire apparatus access roads.

      i. These devices have been shown to delay emergency response times by approximately 10 seconds per device and have been associated with damage to fire and EMS vehicle frames as well as injuries to emergency personnel during response operations. For these reasons, they are not permitted within the City.

   b. Conditional Devices:

      i. Speed cushions or segmented devices designed to allow emergency vehicle clearance may be considered on private property only. These devices require City Fire Code Official approval and must conform to current IFC standards and applicable AASHTO/ITE traffic calming guidance.

      ii. Horizontal traffic calming devices (including but not limited to chokers, chicanes, traffic circles, and similar geometric modifications) may be considered on a case-

by-case basis within both public ROW and private property; however, their implementation must be reviewed and approved by both the City's Engineer and the City Fire ~~Department~~Code Official ~~to verify that such devices do not impede emergency vehicle access, turning radii, or overall response times~~.

3. Design & Installation Standards

   a. All traffic calming devices must include signage and pavement markings in compliance with the most recent ~~MUTCD (Texas~~T-MUTCD edition, where applicable~~)~~.

   b. Additional ~~Right-of-Way~~ROW dedication may be required to accommodate traffic calming devices while maintaining minimum lane widths, drainage, and pedestrian or ~~/~~bicycle access.

   c. Devices must be constructed of durable materials (e.g., pre-molded rubber, modular plastic, or reinforced concrete) to ensure long-term performance and maintain emergency response accessibility.

4. Permitting Requirements

   A separate permit is required to install any speed control device within a designated ~~fire lane~~fire apparatus access road.

5.6 Access Management

5.6.1 Purpose and Goals

The purpose of the access management plan is to promote the health, safety, and general welfare of the present and future residents of the city through managing traffic flow and promoting traffic safety.

In planning and designing access for proposed developments, the following documents should be utilized in conjunction with this section:

A. DDC Section 7.8.9 – Driveways and Access

B. DDC Section 7.8.10 – Cross-Access Between Abutting Developments

C. TxDOT Access Management Manual (if ~~the~~ proposed access ~~is on~~connects TxDOT-maintained facilities)

D. TxDOT Roadway Design Manual (if ~~the~~ proposed access ~~is on~~connects TxDOT-maintained facilities)

These standards collectively ensure safe, efficient, and coordinated access within the city's roadway network.

5.6.2 Access Standards

A. Compliance

1. No person shall construct, reconstruct, replace, relocate, alter, enlarge, improve or perform any work on or make use of any driveway for any property within the City or its extraterritorial jurisdiction, except in accordance with the Access Management standards provided in this Manual or the TxDOT Access Management Manual, when applicable.

2. All driveways shall be designed, installed, located, and constructed in accordance with the

approved specifications, plans, conditions, and requirements of the permit issued for the property, and the requirements of this Manual.

3. No certificate of occupancy shall be issued for any building on any property for which a permit is required, until the construction, improvements, alterations or other work covered by the permit is completed in accordance with the permit issued, the requirements of this Manual, or the provisions of any other applicable ordinance.

4. Where no building permit was required in connection with the requested permit, no driveway on the property for which the permit was issued shall be used until and unless the work is completed in accordance with the permit, and this Manual.

B. Access to Freeways

~~Access to freeways shall only be provided at entrance ramps. Access to frontage roads may be provided in accordance with the standards for access to arterial streets set forth in this Manual, with the following exceptions:~~

~~No access is allowed in areas where TxDOT owns the Control of Access. Such Control of Access may be found on current TxDOT ROW maps.~~

~~No access is allowed within a paved gore area or 250 feet past painted gore of an exit ramp. Similarly, no access is allowed within a paved gore area or 200 feet upstream of the painted gore of an entrance ramp.~~

Direct access from private property to freeway main lanes is prohibited; access is provided exclusively at designated interchanges and ramps. Access to adjacent frontage roads must comply with the TxDOT Access Management Manual and are , subject to the following provisions:

1. Control of Access:

   Access is prohibited in areas where ~~the Texas Department of Transportation (~~TxDOT~~)~~ has established Control of Access.

   Control of Access areas are documented on current TxDOT ~~right-of-way (~~ROW~~)~~ maps.

2. Direct Ramp Access:

   a. Ramps with Frontage Roads: Direct access from adjacent properties or streets is strictly prohibited for the entire length of the ramp.

   b. Interstate Ramps without Frontage Roads or Interstate Interchange Connectors: Direct access is prohibited along the full length of the ramp or connector in accordance with 23 CFR 625.3 and 625.4.

   c. Non-Interstate Facilities without Frontage Roads: Direct access is strongly discouraged. If allowed, the location must be determined based on spacing criteria and procedures outlined in this Manual and the TxDOT Access Management Manual.

3. Frontage Road Considerations:

   Direct access to frontage roads is prohibited in the vicinity of ramp connections to ensure safe merging, weaving, and adequate acceleration and deceleration of vehicles.

4. Ramp Proximity Restrictions:

   a. Exit Ramps: No access shall be permitted within the paved gore area or within 250 feet downstream of the painted gore of an exit ramp.

b. Entrance Ramps: No access shall be permitted within the paved gore area or within 200 feet upstream of the painted gore of an entrance ramp.

c. For further guidance, refer to the TxDOT Roadway Design Manual.

5. Design Considerations:

The spacing of interchanges and ramps shall provide adequate distance for entering and exiting vehicles to safely accelerate, decelerate, and weave, consistent with TxDOT design standards.

C. Access to Arterial Streets

Access to an arterial street shall not be permitted unless there is no other reasonable means of providing safe access to the property. Unless designated as a freeway, all TxDOT Highways shall be considered arterials. Additionally, the geometric, hydraulic, and pavement designs of all access driveways to TxDOT roadways must be reviewed by TxDOT to ensure compliance with their standards.

1. No development shall be allowed access to an arterial street if property excluded from the development could have been used to provide reasonable access to a lesser classified street, or if the property has been previously subdivided in violation of state law or the DDC and if access could have been provided to a lesser street except for such unapproved subdivision of the property.
2. Existing commercial or industrial lots created prior to adoption of the DDC by legal subdivision procedures with exclusive frontage on an arterial street may take access to the arterial in accordance with the access standards in this Manual.
3. Existing single-family and duplex lots created prior to adoption of the DDC by legal subdivision procedures with exclusive frontage on an arterial street may be developed with a circular drive. Such drives shall be designed and constructed in accordance with standards for circular drives provided in this Manual.
4. When drives access to an arterial street is the only reasonable means of providing safe and adequate access to the property as determined by the City's Engineer, the drive design, number of drives, location and construction shall be in accordance with this Manual.
5. Drives on an arterial shall align with existing median openings, other driveways, and "T" intersections, or be offset in accordance with this Manual.

D. Access to Collector Streets

1. Access to collector streets for commercial, office, or industrial development is required and shall be designed and constructed in accordance with the standards provided in this Manual.
2. Single-family or duplex lots shall not be designed such that there is no other means of access other than a collector street.
3. Existing single-family and duplex lots developed prior to approval of the DDC with exclusive frontage on a collector street and no alley may be developed with a circular drive. Such drives shall be designed and constructed in accordance with the standards for circular drives provided in this Manual.
4. Drives on a collector street shall align with existing driveways and 'T' intersections on the

opposite side of the street, or shall be offset in accordance with this Manual.

~~5.~~4.

5.6.3 Fire Apparatus Access Roads

A. Design Standards

~~1. Prior to construction, the design of the fire lane shall be submitted to the Fire officials for review and approval.~~

~~2. Fire apparatus roads shall have an unobstructed width of not less than 24 feet and unobstructed vertical clearance of not less than 14 feet. These are minimums and may be increased where they are inadequate for fire or rescue operations.~~

~~3. Fire lanes shall be constructed to meet the City of Denton's Engineering Standards for a concrete pavement cross-section of a residential street.~~

~~4. Fire lane grade shall be no greater than 10%.~~

~~5. Fire lanes shall be located so that access to all points of the building served is a maximum of 150 feet, as measured by hose lay. This can be increased to 300 feet, for a building fully equipped with an approved automatic fire suppression system and with the fire code official's approval.~~

The design of all fire apparatus access roads ~~and fire lanes~~ shall be submitted to the Fire Department for review and shall ~~approval prior to construction. No fire lane shall~~not be constructed without prior authorization from the City Fire Code Official.

1. Fire apparatus access roads shall be constructed in accordance with the City of Denton standards for the concrete pavement cross-section of a residential street.

2. They shall be designed for all-weather use and capable of supporting fire apparatus with a load rating of up to 75,000 pounds.

~~6.~~3. Width, ~~and~~ Clearance, and Setback

a. M~~M~~inimum unobstructed width of ~~:~~ 24 feet for buildings up to 30 feet in height, and 26 feet for buildings over 30 feet in height.

~~b. Width increases to 26 feet for buildings over 30 feet in height.~~

~~c~~b. Mi~~Mi~~nimum vertical clearance of 1~~:~~ 14 feet.

~~7.~~ Setback~~These minimums may be increased where fire or rescue operations require additional clearance.~~

~~8. Setback from Building:~~

~~d~~.c. from the building face shall be a minimum~~Minimum~~ of 15 feet and ~~,~~ maximum of 30 feet ~~from the building face~~.

~~9~~.4. Fire apparatus access roads must have a ~~Turning Radius:~~minimum inside turning radius of 25 feet, and a minimum outside turning radius of 45 feet.

~~e. Minimum inside turning radius: 25 feet.~~

~~f. Exceptions:~~

a. Driveways less than 24 feet wide may have a ~~:~~ minimum ~~28 feet~~ inside turning radius of 28 feet.

b. Driveways wider than 26 feet may have a ~~:~~ minimum ~~20 feet~~ inside turning radius of 20 feet.

~~a. Minimum outside turning radius: 45 feet.~~

~~10. Construction Standards~~

~~b. Fire lanes shall be constructed in accordance with the City of Denton Engineering Standards for the concrete pavement cross-section of a residential street.~~

~~c. All fire lanes shall be designed for all-weather use and capable of supporting fire apparatus with a load rating of up to 75,000 pounds.~~

~~11. Grade~~

~~12.~~5. Maximum grade for fire ~~lanes~~ apparatus access roads shall not exceed 10%.

~~13.~~6. Proximity to Buildings

Fire ~~lanes~~ apparatus access roads shall be located so that all parts of the building are accessible within 150 feet, measured along the hose lay from the lane.

For buildings fully equipped with an approved automatic fire suppression system, this distance may be increased to 300 feet upon approval of the City Fire Code Official.

~~14.~~ Dead-End Lanes~~:~~

~~15.~~ ~~M~~must provide an IFC-approved turnaround if the dead-end exceeds 150 feet in length (IFC Appendix D).

~~16.~~7. Refer to Sections 5.5.3 and 5.5.4 of this manual for further details regarding turnarounds.

~~17.~~ Traffic ~~Control~~Calming~~:~~

~~18.~~ ~~-~~ No speed bumps or similar traffic ~~control~~ calming devices ~~shall be installed~~are permitted in fire ~~lanes~~ apparatus access roads (IFC 503.4.1).

~~19.~~8.

B. Modification of Existing Fire ~~Lanes~~Apparatus Access Roads

Modification of existing fire apparatus access roads~~lanes~~ MUST be approved by the Fire Marshal's Office.

~~C. Turning Radius~~

~~A 24-ft. wide fire lane will require a minimum of a 25-ft. inside turning radius or as approved by a Fire Code Official.~~

~~D.~~C. Marking

1. Striping

Fire apparatus access roads shall be marked by painting 6-in. wide red traffic lines at ~~the~~ its boundaries ~~of the fire lane~~, as indicated on the plat. The words "NO PARKING FIRE LANE" or "FIRE LANE NO PARKING" shall be four (4) inches high.

2. Signage

Signs shall read "NO PARKING FIRE LANE" or "FIRE LANE NO PARKING" and shall be 12-in. wide and 18-in. high. Signs shall be painted on a white background with letters and borders in red, using not less than 2-in. high lettering. Signs shall be permanently affixed to a stationary post, and the bottom of the sign shall be six (6) feet and six (6) inches or 6'-6" above finished grade. Signs shall not be spaced more than 50 feet apart. Signs may be installed on permanent buildings or walls, as approved by the Fire Marshal.

5.7 Bike and Pedestrian Facility Design

The user should be aware of and utilize the DDC Section 7.8.11 Pedestrian and Bicycle Circulation, in conjunction with this section for the design of bike and pedestrian facilities.

5.7.1 Mobility Plan Component

The City of Denton Mobility Plan includes a pedestrian and bicycle component, which should be reviewed, relative to any proposed transportation improvement.

It should be noted that the City of Denton Mobility Plan is a living document and is periodically updated to reflect the changes in the characteristics of anticipated traffic flow within the City.

5.7.2 Accessibility Standards

The City of Denton considers sidewalks to be accessible routes according to Section 4.3 of Texas Accessibility Standards (TAS) and considers a public sidewalk a "facility". Sidewalks, landings, ramps, and flares shall comply with the most recently adopted TAS, ADA, PROWAG, and FHWA standards. Also, sidewalks, landings, ramps, and flares are subject to the requirements of the Texas Department of Licensing and Registration (TDLR) for inspection purposes. Prior to construction of sidewalks, the Engineer of Record must show proof of TDLR review and approval for accessibility, if the total cost of the public improvements will exceed $50,000.00. Compliance with the regulations shall be the responsibility of the Engineer of Record for the project. Refer to the City of Denton Standard Details for additional requirements.

5.7.3 Geometric Standards

Table 5.7-A shows the standard width of sidewalks and bike lanes for the various roadway classifications. Refer to the City of Denton Standard Details for the locations of sidewalks and bike lanes within the street ROW. The Denton Mobility Plan should be reviewed for any planned bicycle and pedestrian facilities that may exceed those called for by the standard details. Any portion of the proposed facility extending past the ROW shall be contained within a pedestrian access easement. The recorded easement shall extend two (2) feet beyond the edge of the facility.

Table 5.7-A: Bike and Sidewalk Requirements

Roadway Classification	Min. Sidewalk Width [1]	Min. Bike Lane Width [1]
Freeway	N/A	
Arterials – Primary and Secondary	5	10
Major Collector	8	10
Collector – Commercial and Residential	~~8~~5	10
Local – Residential	5	N/A

Local – Rural	N/A	N/A
Local – Alley	N/A	N/A

Notes:
[1] Refer to the City of Denton Standard Details street cross-sections for specific bike and pedestrian recommendations. ~~A minimum 5-ft. wide sidewalk on one side of the street, and a 10-ft. wide bicycle/pedestrian facility on the other side of street will be required.~~
[2] Sidewalks must be at least 6 inches away from the ROW line.
[3] Sidewalks must have green space/parkway between sidewalk and street curb per city Standard Details.
[4] If sidewalks are provided at the back of the curb, then the minimum width must be 6 feet[2].
[5] Inlet covers cannot be part of the sidewalk.
[6] Existing sidewalks that do not comply with~~, even in good condition and~~ ADA and City/Mobility Plan standards should be upgraded ~~- compliant, must be widened~~ to meet current City~~/Mo~~Mobility Pplan and ADA requirements~~standards~~.
[7] For sidewalks or other pedestrian facilities proposed in a TxDOT ROW~~right-of-way~~, a TxDOT permit will be required to do any work.

A. On Bridges

Sidewalks on bridges shall be a minimum width of six (6) feet or wider, as required by the street classification. All street bridges shall have sidewalks on both sides of the bridge. Dependent upon vehicular and pedestrian traffic considerations, a parapet wall may be required to separate the sidewalk from the travel lane. Parapet walls shall be constructed to TxDOT standards. A pedestrian bridge rail shall be constructed on the outside of the bridge to protect sidewalk traffic. Both bridge rails and parapet walls shall meet accessibility standards.

B. On Drainage Crossings

Sidewalk at drainage crossings shall be a minimum width of six (6) feet or wider as required by the street classification. Sidewalk railing shall be provided to protect the sidewalk traffic from the outside edge of the drainage crossing. Dependent upon vehicular and pedestrian traffic considerations, a parapet wall may be required to separate the sidewalk from the travel lane. Parapet walls shall be constructed to TxDOT standards. Railing and parapet walls shall meet accessibility standards.

C. Adjacent to Screen Walls

A minimum additional sidewalk width of two (2) feet shall be required beyond the standard width of sidewalk, for sidewalks adjacent to screen walls.

D. Adjacent to Retaining Walls

A minimum greenspace width of five (5) feet between the sidewalk and the edge of a retaining wall shall be required, for sidewalks adjacent to retaining walls.

5.7.4 Intersection

A. Curb Ramps

The continuation of accessible routes through intersections shall use approved curb ramps that meet accessibility standards. Refer to the City of Denton Standard Details for curb ramps at intersections. Crosswalks through the intersections shall meet accessibility standards.

The following provisions further define requirements for sidewalk connections, proposed barrier-free ramps (BFRs), and receiving ~~barrier-free ramps~~BFRs to ensure continuity, safety, and full accessibility throughout the intersection.

1. ~~Sidewalk Connections:~~ Sidewalks connecting to existing ~~barrier-free ramps (~~BFRs~~)~~ at intersections must be fully ADA-compliant.
2. ~~Proposed Barrier-Free Ramps:~~ Proposed BFRs at project corners must be aligned with existing or planned BFRs on the opposite corners. Plans shall illustrate the full intersection

layout, including all ramps and crosswalks.

~~Receiving Barrier-Free Ramps: For safety, accessibility, and route continuity, a~~A receiving BFR is required in accordance with PROWAG ~~(Public Rights-of-Way Accessibility Guidelines)~~ standards for all new construction and alterations to existing facilities. If no receiving ramp exists on the opposite side of the intersection, a new receiving ramp with an appropriate landing must be constructed, regardless of whether a sidewalk is present. Any exceptions from this requirement must be approved by the City's Engineer.

3.

B. Bike Lanes

Bike lanes at intersections shall consider other traffic movements and facilities such as turn lane movements, transit facilities, parking, and stop bar locations. The current Urban Intersection Design Guide by TxDOT can be used for bike lane design at intersections. The bike lane design at intersections requires the approval of the City's Engineer.

5.7.5 Signage and Pavement Markings

Signage and pavement markings shall be as shown on the TMUTCD Marking & Sign Drawings, and in accordance with the accessibility standards.

A. Crosswalks

Continental type-high visibility crosswalk markings are to be provided in all uncontrolled street crossings, school crossings, downtown areas, or as directed by the City's Engineer.

B. Bike Lane

Traffic control devices such as vertical flex posts, green pavement markings, and wayfinding signage may be required to enhance the proposed bicycle facility, as directed by the City's Engineer. For additional guidance, refer to Section 5.5.5.~~–~~A of this manual.

5.7.6 Amenities

A. Bike Parking

1. Refer to Bicycle Parking Guideline 2nd Edition by the Association of Pedestrian and Bicycle Professionals (APBP) for general guidelines and resources.
2. All bicycle parking facilities/devices shall be constructed to meet commercial grade structural standards.
3. Location Standard:
   a. Bicycle parking must be on the same lot as the principle use.
   b. Bicycle parking must be located in highly visible and well-lit areas.
   c. Bicycle parking must not interfere with accessible paths of travel or accessible parking as required by the accessibility standards.
   d. Bicycle parking must be located within 50 feet of a main building entrance. In multiple building locations, bicycle parking must be distributed in a manner that serves all entrances.
4. Layout and Design:

a. Bicycle rack design:
   i. Support the bicycle in at least two (2) places.
   ii. Enable the frame and at least one (1) wheel to be secured.
   iii. Designed to accommodate "U" shape locking devices.
   iv. Installed to the manufacturer's specifications.
   v. Each bike rack must be designed to accommodate at least two (2) bikes.
   vi. Each bike rack space should ~~provide~~be a minimum of two (2) feet in width and six (6) feet in length.

b. Bicycle Parking Space
   i. Concrete pad built to City of Denton sidewalk standards.
   ii. Must provide clearance of at least two (2) feet from closest wall.
   iii. Must provide clearance of at least three (3) feet between bike racks.
   iv. Must not interfere with pedestrian pathway.

~~A 4-foot aisle is needed behind or beside bike racks for comfortable parking and removal, especially in multi-rack setups~~In addition to selecting an appropriate bicycle rack type, the overall layout of bicycle parking areas shall be designed to ensure safe, efficient, and accessible use. Minimum recommended dimensions for bicycle rack areas are provided in the APBP Bicycle Parking Guidelines, as shown in Figure 5.23. ~~(see Figure 5.23).~~ For larger bicycle parking areas with high turnover rates, multiple access points are recommended to facilitate user circulation and reduce congestion. Where feasible, bicycle parking areas should be oriented and designed to provide protection from weather elements, enhancing both usability and longevity of the racks.

B. Benches

All benches shall be constructed to meet commercial-grade structural standards. Benches shall be secured to prevent displacement. Benches shall not project into any accessible route or alter an accessible route such that it will not meet the accessible route standards.

~~In addition to selecting an appropriate bicycle rack type, the overall layout of bicycle parking areas shall be designed to ensure safe, efficient, and accessible use. Minimum recommended dimensions for bicycle rack areas are provided in the APBP Bicycle Parking Guidelines (see Figure 5.23). For larger bicycle parking areas with high turnover rates, multiple access points are recommended to facilitate user circulation and reduce congestion. Where feasible, bicycle parking areas should be oriented and designed to provide protection from weather elements, enhancing both usability and longevity of the racks.~~

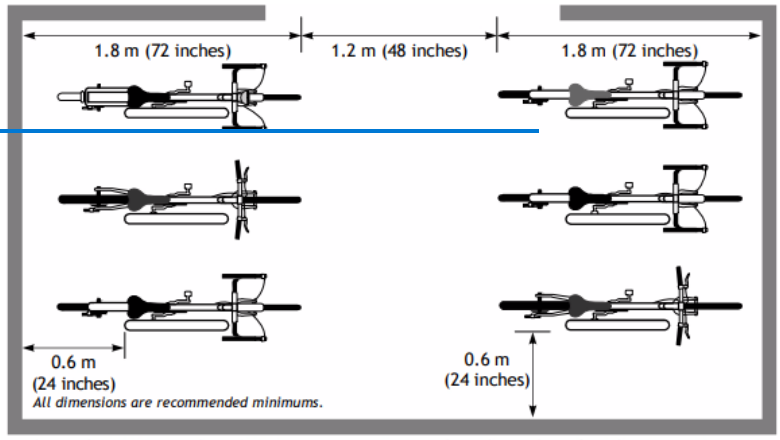


Figure 5.23 Illustration. APBP-recommended design dimensions for bicycle rack areas.

C. Lighting and Enclosures

Lighting standards and above-ground enclosures shall not extend into any accessible route or alter an accessible route such that it will not meet the accessible route standards.

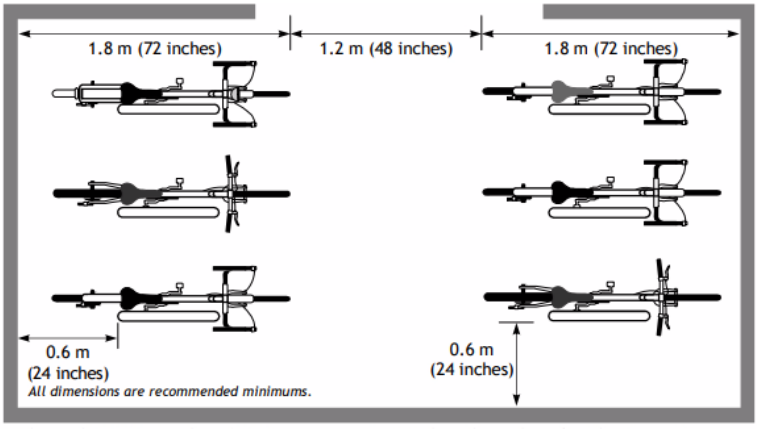


Figure 5.232322 APBP-recommended design dimensions for bicycle rack areas~~Figure 5.23 Illustration~~

5.8 Transit Facility Design

5.8.1 General

Bus stops shall meet at a minimum the design standards of the Denton County Transit Authority (DCTA),

and the accessibility standards of TAS, PROWAG, and ADA. Figure 5.2~~42~~ show a general layout of a bus stop at an intersection. Bus stops shall be located on the departing side of a street intersection. The use of a pull-out lane may be considered where the specific site conditions warrant such an arrangement. The determination of the appropriateness of a pull-out lane shall rest with the City's Engineer.

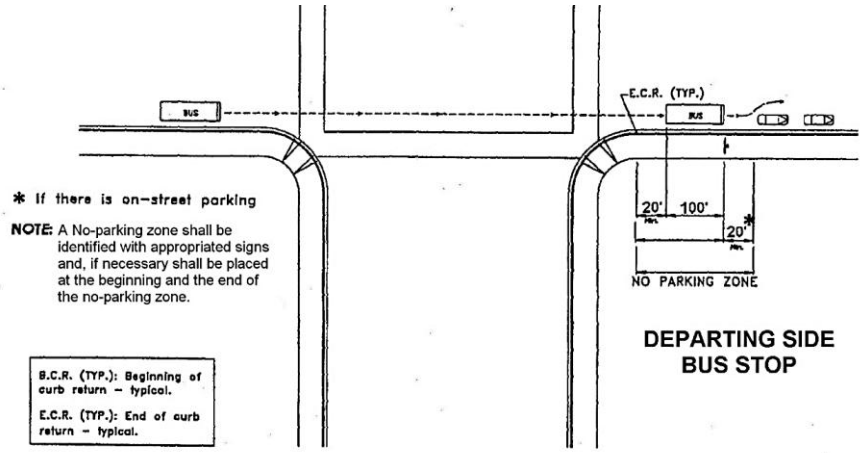


Figure 5.~~242422~~ Standard Bus Stop Location at Unsignalized Intersection

Note: For signalized intersections an Approach Side Bus Stop is preferred

5.8.2 Bus Stop Placement

Bus stop placement should consider the need for the bus stop, traffic operation concerns, and passenger accessibility. A bus stop should be placed within an area that allows bus stop amenities to be located in the public ROW and where the ingress and egress of the bus does not overly impede the flow of traffic. The warrant for a bus stop shall be as required by the City of Denton in conjunction with DCTA. Elements to consider for bus stop placement include the following:

A. ADA and PROWAG compliance of all elements, including pedestrian routes, shelters, signing, etc.

B. Within Public ROW, or a dedicated access easement.

C. Proximity to major trip generators such as malls, student housing areas, retail commercial zones, park and rides, destination areas, etc.

D. Pedestrian facilities such as sidewalks or multi-use paths, marked cross walks, space provisions for accessibility standards, and curb ramps should be available at the location for a proposed bus stop.

E. Convenient passenger transfers to other routes.

F. Open and visible location for personal security and passenger visibility.

G. Acceptable street illumination or proposed street illumination with placement.

H. Ability to have restrictive parking in bus zone.

I. Adequate space for bus zone.

J. Gentle street grades at bus zone.

K. Return to traffic without overly hindering traffic flow.

L. No interference from driveways.

5.8.3 Bus Stop Amenities

The following are bus stop amenities that shall be considered during the process of design:

A. Accessibility compliant loading area. All bus stops shall have accessibility compliant loading and offloading area. This area shall be integral to the sidewalk pathway, bench area, and shelter area, if provided. The loading area shall be constructed of reinforced concrete with the same thickness as the adjacent sidewalk.

B. Bench and trash receptacle may be warranted based upon Table 5.8-A. Bench and trash receptacle type and installation shall be as required by the City of Denton.

C. A shelter may be warranted based upon Table 5.8-A The shelter type and installation shall be as required by the City of Denton and DCTA. Shelters shall provide space to meet accessibility standards.

D. Illumination shall be provided if illumination is not provided at the street corner adjacent to the bus stop, or if in the opinion of the City's Engineer the existing illumination is inadequate.

E. Bus stops that accumulate 10 points or more may be considered for shelter placement. Bus stops that accumulate six (6) points or greater may warrant a bench and trash receptacle.

Table 5.8-A: Bus Stop Amenities Warrant

Points	Condition
6 points	25 people per day boarding
4 points	Special needs, i.e., Senior Center, Medical Complex, libraries, high accessibility standard usage such as group residences
4 points	High use location, i.e., Student housing area, schools, hospitals, mall
2 points	Request for improvements by citizens, i.e., multiple requests over a one-year time
6 points	15 people per day or greater boarding
4 points	Adjacent to an arterial roadway

5.8.4 Bus Stop Signage and Markings

Bus stop signage and markings shall be according to the City of Denton and DCTA. Signage shall include a "No Parking Zone" sign and a DCTA bus stop sign.

5.9 Traffic Impact Analysis Guidelines

5.9.1 General

The purpose of the traffic impact analysis (TIA) is to assess the impacts of development on the existing

roadway system within the study area of the development and to assess the traffic flow needs within the development. The thoroughfare component of the Mobility Plan and the City of Denton traffic model establishes the base conditions for assessing the impacts. The current traffic model and the assessment is based on a Level of Service D according to the current Highway Capacity Manual. The TIA shall be signed and sealed by a licensed Professional Engineer (PE) in ~~a PE Licensed by~~ the State of Texas, and shall be valid for a period of 3 years, unless there is a significant change in the plans or surrounding conditions, as determined by City's Engineer.

5.9.2 ~~Preliminary~~ Trip Generation Assessment

~~All developments are required to prepare a Preliminary Trip Generation Assessment for their proposed projects. The need for a TIA shall be determined by the City's Engineer based upon the information included in the Preliminary Trip Generation Assessment and the criteria in Section 5.9.3 below.~~

A trip generation assessment shall be required for all proposed developments. Developers ~~Applicants~~ shall submit the City-adopted Trip Generation Assessment Worksheet ("TGA Worksheet") as part of Traffic Scoping submittal process. Refer to City's TIA Scoping Checklist. The TGA Worksheet must reflect unadjusted trip generation projections for the proposed development, prepared in accordance with the following resources and methodologies:

A. Trip forecasts shall be based on the most recent edition of the ~~Institute of Transportation Engineers (~~ITE~~)~~ Trip Generation Manual. ~~Applicants~~ Developers shall utilize conservative trip estimates, specifically values falling between the Average Rate and Fitted Curve Equation, where both are provided.

B. If an appropriate ITE Land Use Code is not available, applicants may submit empirical trip generation data from comparable facilities of similar size and function within the Dallas–Fort Worth metropolitan area. Supporting documentation must include a detailed description of the data collection methodology, a demonstration of land use comparability, a description of site conditions, and verification of data reliability. If alternative data sources are used, applicants must provide justification and supporting documentation. All alternative data sources are subject to review and approval by the City's Engineer.

The City's Engineer shall evaluate the TGA Worksheet, in combination with the thresholds and criteria specified in Section 5.9.3, to determine whether a ~~Traffic Impact Analysis (~~TIA~~)~~ is required for the proposed development.

5.9.3 When is a TIA required?

Based on the ~~preliminary trip generation assessment~~ TGA Worksheet for the proposed project, unless otherwise directed by the City 's Engineer, a TIA will be required for the following conditions:

A. Development will generate equal to or more than 50~~100~~ Peak-Hour Trips (PHT).

B. Development will generate equal to or more than 1,000 vehicle trips per day (VPD).

C. Project area to be developed is equal to or more than 100 acres.

D. Changes or alterations to the City Thoroughfare plan based on the Mobility Plan will be requested.

E. Access is taken from a TxDOT roadway, subject to both City and TxDOT TIA requirements.

F. Zoning changes that will negatively increase estimated traffic volumes above the current zoning

estimated traffic volumes.

G. Access is taken from an existing roadway with current traffic flow congestion based upon observed conditions.

H. Development plus recently approved or pending development projects which have not been constructed located adjacent to the site and/or in proximity to the site, meet the above vehicular trip criteria or acreage criteria as determined by the City's Engineer.

~~I. If access is taken from a TxDOT roadway, check TxDOT TIA requirements.~~

5.9.4 TIA Category and Study Area ~~Scoping~~Requirements

~~TIA Study Criteria~~

~~Table 5.9-A shows the number of analysis periods and study area limits for the TIA. Prior to developing the TIA, a Preliminary Trip Generation Assessment shall be developed and reviewed with the City's Engineer, to verify the number of analysis periods and the study area requirements.~~

~~If a TIA is warranted for a development under the conditions outlined in Section 5.9.3, the applicant shall prepare and submit a TIA Scoping Memorandum in accordance with the City's most recently adopted TIA Scoping Check~~

~~st. The scoping process ensures consistency, transparency, and effective coordination between the applicant and the City. A TIA will not be accepted for review without an approved TIA Scoping Memorandum.~~

~~The TIA Scoping Memorandum shall:~~

- ~~Establish the appropriate level of analysis for the proposed development (following Table 5.9-A);~~
- ~~Define study area boundaries and identify required intersections and roadway segments (following Table 5.9-A);~~
- ~~Identify traffic data collection requirements and study periods (following Table 5.9-A); and~~
- ~~Confirm the methodologies, assumptions, and evaluation tools to be applied in the study.~~

Table 5.9-A shows the number of analysis periods and study area limits for ~~the~~ TIAs.

Table 5.9-A: Criteria for Study Requirements

Analysis Category	Site Trips Generated at Full Build-Out	TIA Analysis Periods [1]	Minimum Study Area [3]
I	~~>~~50~~-99 total~~ peak hour ~~driveway~~ trip~~s~~	1. Existing year 2. Opening year [2]	1. All site access drives

II	100-500 total peak hour trips	1. Existing year 2. Opening year [2] 3. Five years after opening	1. All site access drives 2. All signalized intersections and/or major unsignalized intersections within ½-mile to 1 mile of site boundary, depending on total peak hour trips
III	>500 total peak hour trips	1. Existing year 2. Opening year of each phase 3. Five years after initial opening 4. Twenty years after final opening with full build-out	1. All site access drives 2. All signalized intersections and/or major unsignalized intersections within 1-½ miles of site boundary and/or major intersections along access routes to/from regional corridors

Notes:
[1] Analysis periods shall include build and no-build scenarios. Assume full occupancy when each phase opens.
[2] Assume full build-out.
[3] For certain projects, the City may require an enlarged study area. Land uses within the study area should include recently approved or pending development adjacent to the site and/or in proximity to the site.

~~Refer to the City of Denton TIA Scoping Checklist for further details.~~

5.9.5 TIA ~~Submittal Requirements~~Scoping and Report

A. TIA Scoping

If a TIA is warranted for a development under the conditions outlined in Section 5.9.3, the developers shall prepare and submit a TIA Scoping Memorandum in accordance with the City's most recently adopted TIA Scoping Checklist. The scoping process ensures consistency, transparency, and effective coordination between the developers and the City. A TIA will not be accepted for review without an approved TIA Scoping Memorandum.

The TIA Scoping Memorandum shall:

1. Establish the appropriate level of analysis for the proposed development (from Table 5.9-A);
2. Define study area boundaries and identify required intersections and roadway segments (following Table 5.9-A);
3. Identify traffic data collection requirements and study periods (following Table 5.9-A); and
4. Confirm the methodologies, assumptions, and evaluation tools to be applied in the study.

Refer to the City of Denton TIA Scoping Checklist for further details.

B. TIA Report

TIAs shall be prepared in accordance with the City of Denton TIA checklist, the approved TIA traffic scoping, the Denton Development Code (DDC), and TxDOT standards, as applicable. At a minimum, TIA reports shall address the following:

1. Project Description and Existing Conditions – Summarize the proposed development (land use, size, location, phasing) and document existing roadway characteristics, intersection control, traffic volumes, and any planned improvements within the defined study area.
2. Trip Generation, Distribution, and Future Conditions – Estimate trips per Section 5.9.2 methodology, assign them to the network, and evaluate traffic operations with and without the project, considering background growth and approved developments.
3. Operational and Access Analysis – Assess performance of key intersections and roadway segments (LOS, delay, v/c, queues), driveway spacing and sight distance, and internal

circulation. School developments shall include a Traffic Management Plan.

4. Multimodal and Safety Considerations – Identify pedestrian, bicycle, and transit impacts along with any safety deficiencies.

5. Mitigation Strategy and Commitments – Identify operational or safety issues resulting from the proposed development and recommend appropriate mitigation, such as turn lanes, signal adjustments, intersection or geometric modifications, access management strategies, or multimodal enhancements. Proposed improvements should be clearly categorized by timing and responsibility, distinguishing between those required at opening day and those that may be phased or coordinated with other developments or agencies. Recommendations must form a practical implementation plan demonstrating how anticipated impacts will be effectively addressed.

It must be noted that the City's Engineer reserves the right to request additional data, analyses, or scenarios based on project scope or site-specific conditions. Refer to the City of Denton TIA Checklist for detailed formatting and submittal requirements.~~Specific Requirements of the TIA Report~~

~~TIA Report must comply with this section, Denton Development Code (DDC), and TxDOT Standards where applicable, and include but not limited to the following elements:~~

~~Cover page including the following: Name of the development; city- assigned project number; contact information of the developer, owner, applicant, and engineer; and date of preparation (updated with each review).~~

~~Traffic Scope – Approved TIA scoping# TSCXX-YYYY must be included in the Appendix of the report. Any changes from approved scope must be discussed with the city and documented before TIA is submitted.~~

~~Table of Contents – Include List of Figures, Tables and Appendices.~~

~~Executive Summary of the report, including project address, existing zoning and any proposed changes, existing site conditions, proposed development including size & access, general assumptions, traffic analysis summary and recommended mitigation measures~~

~~Introduction that describes the development project and its proposed phasing, description of the surrounding land uses, and traffic generating modes.~~

~~Mobility Plan & City/TxDOT roadway construction projects.~~

~~List if roadways adjacent to the development are in city's mobility plan, include classification, ROW, pavement & sidewalk requirements (refer to 2024 Standard details)~~

~~Indicate if any roadways are in City's Capital Improvement Program (CIP) or have a TxDOT design/construction project.~~

~~Identify any improvements to the roadway sections per DDC 7.8.7.B~~

~~Traffic Exhibits - include the following exhibits in the TIA:~~

~~Site Location map showing all study intersections, site driveways, traffic control at study intersections~~

~~Conceptual site plan – Include street names, all proposed driveway approaches~~

~~Existing lane usage and traffic control at all study intersections~~

~~Map showing location of all background projects assumed in the TIA (when applicable)~~

~~Traffic Volumes Exhibits (must show roadway link volumes)~~

~~Existing Traffic Volumes~~

~~No-Build/Background Traffic Volumes~~

~~Trip Distribution to include distribution from all external links and at site driveways~~

~~Site Generated Traffic Volumes – Include Site Trip Generation Table in the exhibit~~

~~Build/Total Traffic Volumes~~

~~Proposed lane usage & Traffic Control at all study intersections (show mitigation in different color/legend)~~

~~Trip Generation – Provide a trip generation table using the latest edition of Institute of Transportation Engineers (ITE) Trip Generation Manual (use conservative trips between average rate and fitted curve). See example below:~~

ITE LUC	ITE Land Use	Quantity	Variable	Weekday Trips	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
710	General Office Building	500,000	SF	5420	669	91	760	122	598	720
220	Multifamily (Low Rise)	6	Dwelling Units	1685	24	76	100	80	48	128

~~Include Daily Trip Generation for each use at full build-out. If development intends to include phasing, Provide trip generation for each phase and overall development combined.~~

~~AM and PM (and Weekend if necessary) Peak Hour Trip Generation for each use at full build-out~~

~~Summary table and backup tables for calculation methods~~

~~Trip Distribution and Assignment~~

~~a. Include methodology~~

~~b. Show all external ink distribution~~

~~c. For Entrance/Exit from the development~~

~~d. For boundary streets within study area~~

~~Existing and Projected Traffic Volumes~~

~~a. Average Daily~~

~~b. Peak Hourly AM and PM~~

~~c. Weekend Peak Hours (specifically for Religious facilities, Major Shopping Centers and Special Generators)~~

~~d. All traffic volume exhibits must include roadway link volumes~~

~~Traffic Study Elements~~

~~a. Intersection Capacity/Level of Service Evaluation for AM and PM Peak Hours~~

~~Identify all thoroughfares, driveways, intersections, and individual movements that do not meet LOS D.~~

~~Identify mitigation for movements where site traffic is deteriorating beyond LOS D. For intersections that are at LOS E/F in the background condition, mitigation must be identified to maintain or improve Volume to Capacity ratio and delay to background condition.~~

~~Improvements to mitigate background condition's LOS E/F cannot be assumed unless there are~~

committed projects by City or TxDOT.

b. Roadway Link Capacity Analysis

c. Parking Demand Analysis (if proposing alternative parking standards per DDC 7.9.5)

Site Access Evaluation (Include applicable tables and exhibits)

Driveway approach standards & spacing per city or TxDOT standards when applicable.

Sight distance evaluation.

Median Access evaluation or TxDOT standards when applicable.

Turn Lane Warrants/Requirement

Turn Lane Geometry (storage and taper requirements), or TxDOT standards when applicable

Signal Warrant Analysis as needed for the study intersections or determined by the City of Denton Engineer or designee.

Queue Analysis for all drive-through facilities and Gated Entries.

Bicycle and Pedestrian Infrastructure Evaluation

Per City Mobility Plan & Roadway classification – Include required width details.

Bicycle Paths/Routes and Trail Connection Assessment

Safety Assessment – Evaluation of Historic Crash Data.

Traffic Management Plan (TMP) for school development or expansion

Conclusions and Recommendations - The report shall include the findings from above sections and include recommended mitigation measures that are the responsibility of the proposed development.

Dependent upon the site characteristics, the City's Engineer may require additional information to be included in the TIA.

At a minimum the TIA report will include the following items:

Introduction that describes the project and traffic generating modes.

Traffic Analysis Map:

Existing and Proposed Land use within Study Area.

Study Area Boundary.

Existing and Proposed Roadways.

Designation of Traffic movement elements.

Thoroughfare Plan Elements within Study Area

Trip Generation Calculations as per the most recent ITE Trip Generation Manual:

Daily and Peak Hourly Trip Generation for fully developed project conditions. Include both AM and PM Peak Hours. Provide Summary table and backup tables for calculation methods.

Discount assumptions based upon City's Engineer's approval.

Trip Distribution and Assignment Tables and Figures:

For Entrance/Exit from the development.

For boundary streets within study area.

Existing and Projected Traffic Volumes for Study based upon Table 5.9-A above:

~~Average Daily.~~

~~Peak Hourly AM and PM.~~

~~Additional Traffic Volume Data Provided by the City's Engineer.~~

~~Traffic Volume Analysis:~~

~~Level of Service Evaluation for AM and PM Peak Hours.~~

~~Turn Lane Evaluation for project site and study area. The extent of evaluation to be determined by the City's Engineer.~~

~~Signalization Evaluation for project site and study area. The extent of the evaluation to be determined by the City's Engineer.~~

~~Identification of all thoroughfares, driveways, intersections, and individual movements that do not meet LOS-D.~~

~~Recommendations:~~

~~Proposed recommendations to mitigate impacts to transportation system within the study area.~~

~~Document Requirements: The following provides a general outline for the TIA report:~~

~~Executive Summary~~

~~Introduction~~

~~Purpose~~

~~Methodology~~

~~Existing and Proposed Land Use~~

~~Site Traffic Generation~~

~~Existing and Proposed Traffic Flow~~

~~Transportation System~~

~~Transportation Volumes~~

~~Traffic Analysis~~

~~Level of Service Evaluation~~

~~Turning Movement Evaluation~~

~~Signalization Evaluation~~

~~Active Transportation Impact Evaluation~~

~~Bicycle Paths/Routes and Trail Connection Assessment~~

~~Pedestrian Impact Analysis~~

~~Safety Assessment~~

~~Mitigation~~

~~Conclusions and Recommendations~~

~~Additional Requirements~~

~~Dependent upon the site characteristics, the City's Engineer may require additional information to be included in the TIA.~~

5.9.6 School Traffic Management Plan

A. Purpose

Schools generate atypical traffic conditions that require special consideration. They produce higher-

than-usual vehicular traffic, concentrated traffic loads at specific times, and a mix of different vehicle types. Consequently, traffic management should be given the highest priority when evaluating new school sites, upgrading existing sites, or reviewing ongoing school operations.

A School Traffic Management Plan (TMP) is a site-specific plan that addresses the school campus and adjacent street network. It provides guidelines to coordinate traffic circulation during school peak hours, ensuring that all road users are safely and efficiently guided through the site while maintaining the performance of the roadway and minimizing impacts on surrounding properties.

~~D.~~B. Applicability

A TMP is required for:

1. Any new school development; or
2. Developments that are expected to significantly impact traffic operations at an existing school.

The TMP must be prepared and submitted as part of the TIA to demonstrate that traffic conditions at school access points have been adequately evaluated and mitigated.

~~E.~~C. TMP Preparation and Certification

1. The TMP shall be prepared by a licensed Professional Engineer (PE) in the State of Texas with expertise in transportation and traffic engineering, preferably certified as a Professional Traffic Operations Engineer (PTOE).
2. Field observations of both morning drop-off and afternoon pick-up periods shall form the basis of the TMP.
3. The TMP must be signed, stamped, and dated by the licensed PE and include a statement confirming that it was developed with input from individuals familiar with the site's traffic characteristics, including contact information for the approving school administration official.
4. The TMP should be prepared in a format suitable for distribution to parents, students, and school staff.

~~F.~~D. TMP Content Requirements

The TMP shall include, at a minimum, the following elements:

1. Site and Roadway Description
    a. Location of the school site and description of adjacent roadways.
    b. All points of vehicular and pedestrian access (ingress and egress).
2. TMP Exhibit
    a. Scaled site diagram showing building footprints, curbs, pavement markings, parking areas, and designated student drop-off and pick-up locations.
    b. Aerial images are not acceptable due to replication challenges.
3. Traffic Operations
    a. Summary table indicating school schedule, student enrollment by grade, maximum vehicular accumulation, on-site storage capacity, and surplus during dismissal periods or at designated loading zones.
    b. On-site traffic circulation plan, including any temporary traffic control devices.

c. Proposed coordination system for student drop-off and pick-up (e.g., passenger identification, separation of transportation modes, and staggered arrival/dismissal times).

4. Staffing and Supervision
   a. Number and location of school staff assisting with loading/unloading students, with roles and responsibilities clearly defined.
   b. Number and location of adult crossing guards or off-duty law enforcement personnel.
5. Pedestrian and Bicycle Considerations
   a. Identification of pedestrian routes up to 0.5 miles from all school access points.
   b. Strategies to encourage walking and biking.
6. Parking and Parent Communication
   a. Parking management strategies for on-site and nearby public areas.
   b. Communication plan to inform and engage parents, students, staff, and neighbors regarding the TMP.
7. Additional Considerations (if applicable)
   a. School bus loading and unloading operations.
   b. Methodology for projected maximum vehicular accumulation.
   c. Traffic control plan showing signage on public rights-of-way.

~~8.~~ High-Speed Roadway Considerations

8. : For schools adjacent to roadways with posted speed limits of 35 mph or greater, the TMP shall include:
   a. Turning movement counts at all major intersections adjacent to the school.
   Stopping and intersection sight distances at all school driveway approaches.
   ~~d.~~b.

~~5.9.5~~5.9.7 Safety Assessment

Consistent with the recently adopted Mobility Plan, safety is the number one priority for the City of Denton and as such, all new developments will be required to conduct a safety assessment as part of their TIA. The safety assessment will include a review of safety for all road users (vehicles, pedestrians and bicycles) within the project site as well as along existing public ROWs in the vicinity of the project. The assessment will include a review of the following:

A. Within the project site (Site Circulation).
B. All new intersections including project driveways.
C. Evaluation of Historic Crash Data at all existing intersections and roadways ~~are~~ included in the TIA.

5.9.8 Queue Analysis for Drive Through Facilities

A review of proposed drive through operations must be included in the TIA. The evaluation must include:

A. Illustration of proposed operations (i.e. access points and queue formation).

B. Anticipated maximum demand/queue (preferably based on observations of other existing sites with similar characteristics or using service rate queue analysis).

C. Maximum queuing capacity on-site.

D. Mitigation plan (Exhibit showing site plan) for if/when traffic ever exceeds design capacity to prevent queues blocking sidewalks or travel lanes of adjacent roads. The plan needs to show how the operator would have to manage longer queues without compromising safety (e.g. double queue, cones, pavement markings, signs, etc.). The plan needs to be signed by the traffic engineer whom the City would contact if/when needed to resolve back up problems once the tenant is in operations - ~~—~~same as the traffic study.

E. The following information must also be included:

1. Peak hour turning movements at intersections with driveway during AM & PM peak hours of adjacent street.

2. Average Daily Traffic on abutting street.

3. Show adjacent street traffic lane configuration, dedicated turning lanes, traffic control.

~~9.~~4. Site plan showing all dimensions of all driveways, sidewalks, crosswalks.

~~5.9.6~~ TIA Submission and Review Procedures

~~**5.9.7 A Preliminary Trip Generation Assessment of the proposed development shall be conducted to determine the TIA requirements such as limits of study area, need and type of turning movement evaluation, need for signalization evaluation, discount assumptions that can apply, and criteria to be used. Sufficient base information shall be submitted to the City's Engineer in order to provide proper guidance on TIA requirements for the report. Subsequent to the submittal of the preliminary trip generation assessment, a meeting with the City's Engineer should be scheduled to discuss the specific requirements for the TIA.**~~

~~**5.9.8 Upon completion of the TIA report, two (2) copies of the report shall be submitted to the City's Engineer for review.**~~

~~**5.9.9 After a TIA is approved and if the development proposed land use and/ or proposed traffic generation characteristics change, the TIA shall be updated and re-submitted to the City for approval.**~~

A. Trip Generation Assessment

The Trip Generation Assessment, as described in Section 5.9.2 of this Manual, must be completed and submitted as Part A of Traffic Scoping submission to see if a TIA is required.

B. TIA Scoping ~~(TSC) Memorandum~~

1. If a TIA is required (as determined in the ~~Trip Generation~~TGA worksheet), or clearly warranted under conditions in Section 5.9.3, TIA Scoping must be submitted following the direction provided in section 5.9.4, 5.9.5.A & the ~~c~~City's TIA Scoping Checklist Past B section.

2. The TIA scope must be reviewed and approved by the City prior to TIA application submittal.

~~B.~~C. TIA Report Submission

TIA Report Submission must follow Section 5.9.5.B and the City's TIA checklist.

~~Upon completion of the TIA, two (2) copies of the report shall be submitted to the City's Engineer for review.~~

D. TIA Updates

If the development's proposed land use or traffic generation characteristics change after TIA approval, the TIA must be updated and resubmitted to the City for approval.

~~All existing intersections included in the TIA.~~

~~5.9.9 Bike/Ped TIA~~

~~All projects are expected to achieve the minimum acceptable LOS standard for onsite and off-site bicycle and pedestrian facilities. Pedestrian and bike facility demand shall be identified and related items for discussion should include:~~

~~A. School routing plans per the TMUTCD between the project and all schools within ½ mile of the project boundary.~~

~~B. The demand for pedestrian and bike facilities to serve high pedestrian activity areas within the land use.~~

~~C. The need for links of bicycle or pedestrian facilities to neighboring land uses or attractions (trails, etc.) within ¼-mile (or greater if applicable to unique pedestrian-oriented destinations) of the project site.~~

~~D. Existing and proposed sidewalk width, separation from traffic, and space available for trees, transit stops (if any), or other related elements (if any).~~

~~E. Geometric improvements and recommended traffic control devices to accommodate pedestrians and bicyclists.~~

~~F. Existing and proposed pedestrian and bike facilities shall be evaluated for compliance with the following elements:~~

~~1. Directness. Walking distance to destinations like transit stops, schools, parks, and commercial or activity areas should be direct. Measurement of directness is the ratio of the actual distance to a destination via a sidewalk or pathway divided by the minimum distance characterized by a grid street system.~~

~~2. Continuity. The sidewalk/ walkway system should be complete, without gaps. The pedestrian corridor should be integrated with the activities along the corridor and should provide continuous access to destinations.~~

~~3. Street Crossings. Safety and comfort is essential while crossing streets, intersections and mid-block crossings. Factors that affect the LOS include: number of lanes to cross, crossing delay for pedestrians, signal indication, cross-walks, lighting, raised medians, visibility, curb ramps, pedestrian buttons, convenience, comfort, and security.~~

~~4. Visual Interest and Amenity. Pedestrians enjoy visually appealing environments that are compatible with local architecture and include street lighting, fountains, and benches.~~

~~5. Security. Pedestrians should be visible to motorists, separated from motor vehicles and~~

bicycles, and under adequate street lighting.

6. Surface Condition. Pedestrian facilities should be free from obstructions, cracks, and interruptions.

The pedestrian Level of Service for the facility/corridor linking these destinations to the project site will be based on the directness, continuity, types of street crossings, walkway surface condition, visual interest/amenity, and security of the selected route(s), as shown in Table 5.9-B below.

Table 5.9-B: Bike/Ped TIA Criteria

Quality Indicators	A	B	C	F
Security	Well used, good lighting levels and unobstructed lines of sight	Unobstructed lines of sight, good lighting levels	Sidewalk configuration and parked cars present sight problems, moderate lighting	Major pedestrian visibility problems, streetscape is pedestrian intolerant
Directness (Sidewalk Distance/ Minimum Distance)	< 1.4	1.4 - 1.8	1.8 - 2.2	> 2.2
Continuity	Quality, continuous pedestrian networks that are physically separated from street and built to current standards	Continuous sidewalk network on both sides of the street. May not be built to current standards	Sidewalk network where there may not be sidewalks on both side of the street or there are minor interruptions in connectivity	Breakdown in pedestrian network to where each pedestrian chooses a different route

Street Crossings (Signalized Intersections)	3 or fewer lanes to cross, clear indications (striping, etc.), well-marked crosswalks, good lighting, standard curb ramps, automatic pedestrian signal, pedestrian amenities, unobstructed views	4 or 5 lanes to cross, clear indications, well-marked crosswalks, pedestrian refuge area, standard curb ramps, pedestrian amenities, standard curb ramps, unobstructed views	6 or more lanes to cross, clear indications, well-marked crosswalks, pedestrian refuge area, standard curb ramps, pedestrian amenities, unobstructed view	Missing 5 elements of A, 4 elements of B, and 2 elements of C
Street Crossings (Unsignalized Intersections)	Well-marked cross walks, good lighting levels, standard curb ramps, street character suggests pedestrian crossing, unobstructed views	Missing 1 element of A	Missing 2 elements of A	Missing 3 or more elements of A
Visual Appeal and Pedestrian Amenities	Visually appealing and compatible with local architecture and artist themes, wide sidewalks, window shopping, pedestrian lighting, trees and street furniture	Wide sidewalks, visual clarity, some street furniture and landscaping	Functionally operational with less importance placed on visual appeal	Design ignores pedestrian with negative metal image, intimidating
Surface Condition	Smooth asphalt or concrete with few breaks or cracks	Relatively smooth asphalt or concrete with frequent breaks or cracks	Rougher, broken surface such as older concrete or cobblestone	Difficult, unpaved terrain such as hiking trails

Table 5.9-C below can be used to identify the pedestrian destinations within ¼ mile (½ mile for schools) of the project boundary.

Table 5.9-C: Bike/Ped Destination Identification

ORIGIN (project land use) \ DESTINATION	RECREATION	RESIDENTIAL	INSTITUTION	OFFICE/ BUSINESS	COMMERCIAL	INDUSTRIAL	OTHER (SPECIFY)
RECREATION							
RESIDENTIAL							
INSTITUTION (SCHOOL, CHURCH, CIVIC)							
OFFICE/BUSINESS							
COMMERCIAL							
INDUSTRIAL							
OTHER (SPECIFY)							

5.10 Pavement Design Standard

5.10.1 Streets

The minimum pavement section requirements for each classification of roadway are contained within the City of Denton Standard Details for pavement cross-sections.

A. A geotechnical report shall be prepared that documents the existing soil characteristics of the proposed roadway subgrade for any proposed street improvements. Soil testing shall be performed whenever the soil characteristics change or every 500 feet, whichever is less. The report shall include recommendations for the type and treatment level of subgrade stabilization based upon ultimate traffic conditions.

B. Flex-base may be used as an option for subgrade treatment. Depth of flex-base required shall be based upon the geotechnical report for the street improvements based upon ultimate traffic conditions.

C. Alternative pavement sections may be proposed only if supported by a geotechnical report that provides sufficient evidence to demonstrate that the alternate section shall meet the ultimate traffic loading requirements.

5.10.2 Drive Approach

Refer to the City of Denton Standard Details for drive approach section requirements.

5.11 Complete and Context-Sensitive Streets

Complete streets are transportation facilities that are planned, designed, operated and maintained to provide safe mobility for all users (including bicyclists, pedestrians, transit vehicles, truckers and motorists) appropriate to the function and context of the facility. Context-sensitive solutions formulate a complete street design considering contextual applications. Contextual applications can be of geographical nature such as Urban Core, General Urban, Suburban, University Core and other typical service areas that require unique components to address the overall transportation facilities.

Within the geometric standards are options that relate to developing a complete street that accounts for all transportation facilities within the context of the associate area. Connectivity and context-sensitive solutions are essential to meeting the goals of the standards. Refer to the City of Denton Standard Details for cross-section details, and the pedestrian and bicycle components of the 2022 Mobility Plan for planned facilities, or as required by the City of Denton during development review.

BIKE LANES – Bike lanes shall be six (6) feet wide unless otherwise approved by the City's Engineer. Buffered or separated bike lanes are generally preferred to increase level of comfort in the bicycle facility.

OFF-STREET MULTI-USE PATH – Some development areas will warrant the use of off-street multi-use paths for pedestrian and bicycle traffic connectivity to other facilities as identified by the City of Denton. Multi-use paths shall be 10 feet wide, unless otherwise approved by the City's Engineer.

TRANSIT – Bus stop locations may be required by the City of Denton for connectivity of the transit system. *See* Section 5.8 of this Manual for details.

MEDIAN VS. CONTINOUS LEFT TURN LANE – Selection of a median or continuous left turn lane shall be based upon the TIA, connectivity, adjacent uses, and other factors required by the City's Engineer. Medians shall be 24 feet back of curb to back of curb, unless otherwise approved by the City's Engineer. Continuous left turn lanes shall be 11 feet wide.

MODIFICATIONS TO STANDARDS – Modifications to the standards may have to be considered in some instances based upon context-sensitive use. An example of context-sensitive use which may require the standards to be modified is a roadway corridor restriction that creates limitations that cannot be altered. An example of a roadway corridor restrictions would be existing infrastructure and/or buildings that must remain. Another example is infill development. Modifications to the standards based upon context-sensitive use shall be at the sole discretion of the City's Engineer.

Section 6: Water and Wastewater Design Criteria

6.1 Overview

The purpose of Section 6 - Water and Wastewater Design Criteria is to provide minimum, non-exhaustive ~~guidelines~~ criteria for the design and construction of water distribution and wastewater collection systems within the City of Denton, Texas and its extraterritorial jurisdictions.

~~Section 6: Water and Wastewater Design Criteria is organized as follows:~~

~~A. Overview~~

~~B. Water Distribution System Design Guidelines~~

~~C. Wastewater Design Guidelines~~Wastewater Collection System Design

~~D. Construction Plans~~

It is the responsibility of the design engineer to ensure the final design of water distribution and wastewater collection systems are in conformance with the most recently adopted versions of the following documents:

A. Texas Administrative Code (TAC) Title 30, Part 1, TCEQ – Ch. 290;
B. Texas Administrative Code (TAC) Title 30, Part 1, TCEQ – Ch. 217;
C. Texas Administrative Code (TAC) Title 16, Part 2, PUCT – Ch. 24;
D. City of Denton Code of Ordinances and the DDC;
E. The City of Denton's Standard Details and Standard Specifications for Construction;
F. City of Denton Water Distribution System Master Plan;
G. City of Denton Wastewater Master Plan;
H. American Water Works Association (AWWA) Standards;
I. The International Building Code (IBC);
J. The International Plumbing Code (IPC);
K. The International Fire Code (IFC); and
L. This Manual.

The criteria established in Section 6 of this Manual provide basic guidance for the design of water and wastewater systems. However, ***full responsibility and liability for proper design remains with the design engineer.*** Users of this Manual should be knowledgeable and experienced in the theory and application of water and wastewater engineering. If criteria established in Section 6 overlap with state statutes, rules, or regulations, –the more stringent requirement shall apply. The criteria established in this Section do not supersede the criteria contained in the DDC. In the case of conflict between this Section, City of Denton Standard Details, or other cited City regulations and standards, the more stringent requirement shall apply.

The ~~Director~~ General Manager of Water Utilities and Street Operations reserves the right to require extended review, direct the design, location specifications and details of vertical water utility infrastructure, and large horizontal infrastructure including, but not limited to, water treatment plants (WTPs), elevated

storage tanks (ESTs), booster pump stations, water ~~transmission~~ mains ~~over~~ 16 inches in diameter or greater, wastewater reclamation plants, peak flow detention facilities, sewer lift stations and sewer interceptors over 12 inches in diameter. The ~~Director~~ General Manager of Water Utilities and Street Operations reserves the right to deny proposals at his or her discretion.

6.1.1 Organization

Section 6 - Water and Wastewater Design Criteria is organized as follows:

A. Overview
B. Water Design Criteria
C. Wastewater Design Criteria
D. Construction Plans

6.2 Water Design Criteria~~Guidelines~~

6.2.1 ~~Size of Water Distribution Mains~~Distribution System Extensions

A. General

Water mains shall be sized to meet the calculated water demand, fire flow protection requirements, and to conform to the City of Denton's Water Distribution System Master Plan (Water Master Plan or WMP). All residential, commercial, industrial, and any other development connecting to the City's water distribution system shall use the following guidelines:

1. The design engineer shall obtain the record drawing water maps from the Capital Improvement Projects & Engineering Division and use the following criteria, based on the City's WMP, for sizing the water lines.
    a. Average daily demand in gallons per capita per day = 160 GPCD
    b. Maximum daily demand / Average daily demand = 2.0
    c. Peak hour demand / Maximum daily demand = 1.5
    d. For Single-Family Residential – Use 3.2 people/unit
    e. For Multifamily Residential – Use 2.5 people/unit
    f. Refer to 30 TAC § 290.45 (d)(1) Table A - Non-community water systems
2. Water distribution systems extensions shall ~~be~~ provide ~~d with~~ sufficient ~~number of~~ connections to the City's existing water system, ~~and~~ integrating existing main extensions to the development (including dead-end mains) from adjacent properties to the system extension, for the demand of the proposed extension and shall be extended to neighboring properties for subsequent system extensions. System extensions shall be of sufficient size to furnish adequate domestic, irrigation and fire protection water supply ~~for fire protection~~ to all lots within the development and conform to the City WMP. Every new water system extension shall include two (2) or more connections to the existing City water system when feasible, to ensure an adequate and reliable water supply in the event of a water main break or routine system maintenance. The City may require two (2) or more meter connections, particularly for large and/or densely developed lots~~larger developments~~. Good engineering

judgement is required to ensure reliability is considered in the design of all proposed water systems

~~3. Sites that require an irrigation meter shall have two separate service line connections onto the main: one for the domestic meter, the other for the irrigation meter.~~

~~4. Water pipe shall be a minimum of eight (8) inches in diameter. The standard pipe sizes that shall be used for water main lines are 8-in., 12-in., 16-in., 20-in., 24-in., 30-in., 36-in., and 42-in. pipes. Pipe sizes of 6-in., 10-in., 14-in., 18-in., 21-in., and 33-in. are considered non-standard by the City and shall not be used for water main lines. A 6-in. pipe may be used for fire hydrant connections.~~

~~5.~~3. Every development shall provide adequate water capacity for fire protection purposes. Fire flow capacity requirements are in addition to daily demand requirements. The procedure for determining fire flow requirements for buildings or portions of buildings shall be in accordance with the version of the IFC adopted by the City. For any platted lot where the end use is not defined, the standards in Table 6.2-A~~Table 6.2-A~~~~Table 6.2-A~~ shall apply

4. The cost for modeling a project's impact with the City's distribution system model will be the responsibility of the developer and paid to the City.

B. Distribution System Operational Limits

The City observes the following operational limits for the distribution system under normal usage:

1. Maximum ~~V~~velocity for ~~proposed~~ mains (~~greater than 1~~16 inches or more): 3 fps, with up to 5 fps on case-by-case basis
2. Maximum velocity for ~~proposed~~ mains (~~less than or equal to~~ 16 inches or less) under non-fire flow conditions: 5 fps
3. Maximum velocity for mains (12 inches or less) ~~12" and smaller~~ under maximum day demand + fire flow scenario: 10 fps

~~2.~~4. Maximum head loss (~~less than or equal to~~ 12 inches or less): 5 feet per 1,000 feet

~~3.~~5. Maximum head loss (~~greater than or equal to~~ 16 inches or more): 3 feet per 1,000 feet

~~4.~~6. Hazen-Williams Roughness Coefficient (C): 130

Proposed impacts to the City's system determined to, or likely to, cause (through hydraulic modeling or other analysis) these limits to be exceeded, are prohibited without additional improvements to the public system ~~so the system can be operated within these parameters~~ to allow proper operation of the system.

Table 6.2-A: Water Capacity for Fire Flow

Area	GPM
One (1) and two (2) family dwellings - less than 3,600 sq. ft.	1,000
Buildings other than one (1) and two (2) family dwellings - less than 3,600 sq. ft.	1,500
Medium-intensity commercial and light industrial	3,000

High-intensity commercial and industrial	4,000

Notes:
[1] All fire flows to be calculated with 20 psi residual pressures.
[2] In addition to the fire flow requirements specified above, all developments shall provide adequate water capacity to satisfy the greater of: (a) Peak Hour demand for the Peak Day, or (b) Average Hour demand plus fire flow for the Peak Day.
[3] Special exceptions to the above standards may be made by the City's Engineer for unique situations.

C. Public Fire Hydrants

Fire flow requirements shall be in accordance with the IFC as adopted by the City of Denton or Denton County, as appropriate.

D. Private Fire Mains

In addition to the requirements of Section 6.2.12.B of this Manual above, private fire protection water mains shall be installed in accordance with NFPA 24 and ~~2021~~ the adopted IFC requirements. Private fire protection mains and associated hydrants shall be permitted by the Fire Marshal's Office with jurisdiction ~~over the area~~.

E. Fire Flow Tests

Fire flow tests are normally requested by the design engineer, the Mechanical, Electrical and Plumbing (MEP) engineer, and other engineers to determine available water system capacity at or near the point of interest. If a fire flow test on the existing water system is necessary, contact ~~the~~ Water Distribution ~~Metering Department~~ at FireFlowTesting@cityofdenton.com ~~(940) 349-8456 directly~~.

F. Pressure Planes

The City of Denton's Water Distribution System is divided into several water pressure planes to ensure even water-pressure gradients. Prior to the design of connection points between a proposed main and any existing main, the design engineer shall investigate and determine if the proposed water main crosses the boundary between different pressure planes.

Even though physical connections of water pipes exist between pressure planes, they are designed with valves which are closed at the boundary points so that each pressure planes is isolated. Proposed mains that approach pressure planes boundaries shall be designed to loop within their designated pressure planes and with no or minimum lengths of dead-end mains.

Connections between pressure planes must be approved by the General Manager of Water Utilities and Street Operations and may require pressure-reducing valve stations. The design engineer can determine the pressure planes boundaries by consulting the record drawings which show the designated closed valves between pressure planes and by contacting Water Utilities. *See* Figure 6.1 below for the 2025 Water System Pressure Plane Map.

The Central pressure plane operates at a Hydraulic Grade Line (HGL) of 826 feet and includes service elevations between 540 feet and 700 feet. It is recommended that any areas above 700 feet be served from the West pressure plane, if possible. An alternative to connecting new development to the higher-pressure plane includes grading sites at or below 700 feet. Areas at elevations below 600 feet may experience high pressure. Individual Pressure Reduction Valves (PRVs) may be needed to maintain an acceptable pressure range.

Eastern pressure planes (i.e. East and Southeast) have a HGL of 745 feet are supplied from the Central pressure plan by reducing pressure via system pressure-reduction valves. Service elevations for the eastern pressure planes range from 515 feet and 615 feet.

The West pressure plane operates at an HGL of 900 feet at the Northwest EST, 905 feet at the

Southwest EST and includes service elevations between 670 feet and 770 feet. The boundary between the West and Central pressure plane generally follows the 670-foot contour. Any areas at elevations greater than 770 feet will not be able to be served by the existing distribution system due to low static pressures. Areas near the suction side of the Southwest Boost Pump Station should be served from the West pressure plane due to the decreased residual pressure in the Central pressure plane in this area.

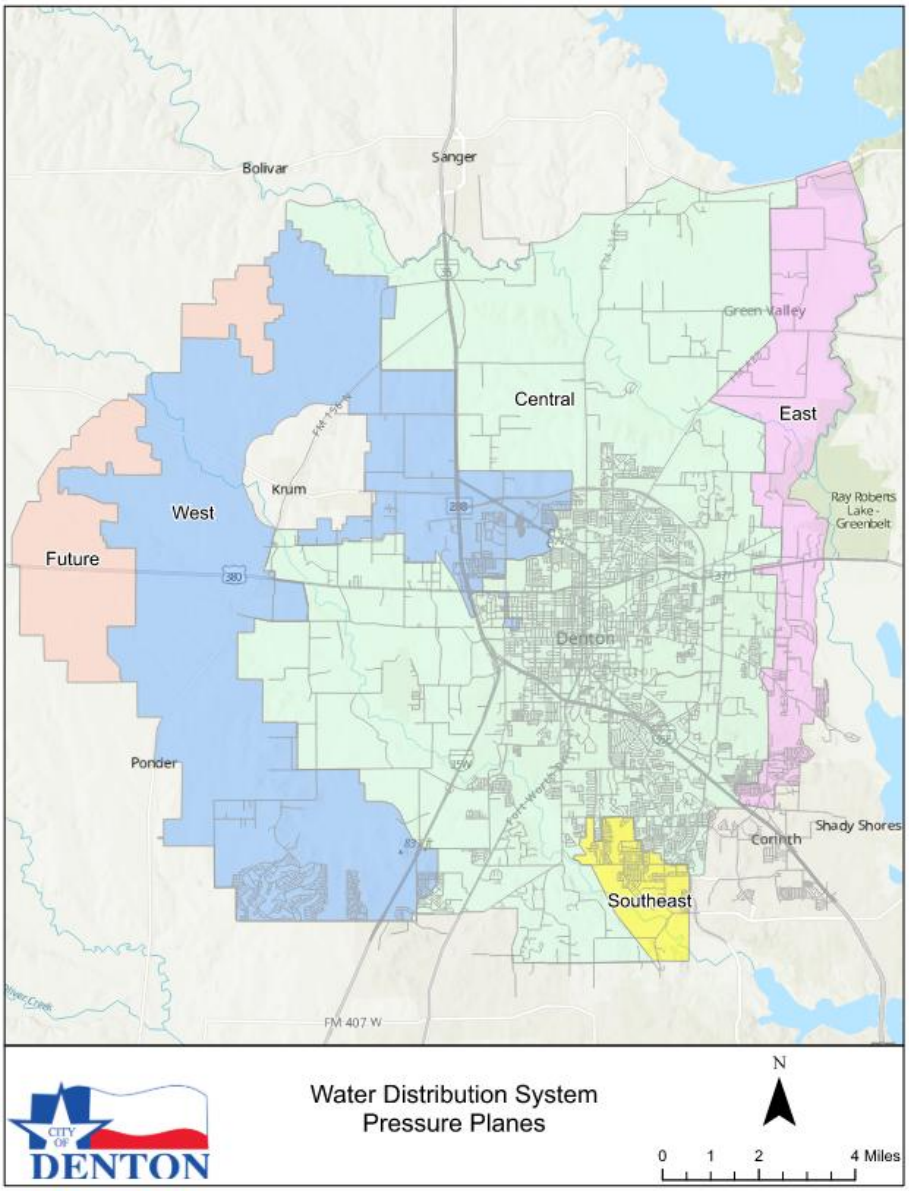


Figure 6.1 2025 Water Master Plan Pressure Plane Map

6.2.2 Water Main Horizontal and Vertical Alignment

The following guidelines should be followed by the design engineer in placement of water lines:

A. In existing streets, water lines shall be placed in the pavement four (4) feet from back of curb. For new residential development, water lines shall be placed on the north and east sides of the streets, where possible, four (4) feet from back of curb. See the City of Denton Standard Details.

B. All water lines shall be laid as straight as possible. Avoid excessive number of high points and low points between cross street connections, as they trap air pockets. See Section 6.2.6.B of this Manual for placement of air release valves.

C. Minimum radius of curvature and maximum deflection angle of pipe joints are restricted to the manufacturer's recommendation, after which, horizontal or vertical bends are required. Deflection of pipe shall only be permitted through joint deflection; no bending of pipe is allowed.

D. Vertical bends shall be no greater than 45 degrees.

E. Except for transverse pipe crossings, no other utility shall be installed over, under or within five (5) feet horizontally of a water line.

F. There shall be at least two (2) feet of vertical separation between a water line and any utility or storm drain crossing it.

G. Water lines shall not be located closer than 10 feet to any building or structure, or located where the excavation of which could place the stability of another structure in jeopardy.

H. Where distribution mains run parallel to transmission mains 16 inches or larger, a non-standard cross-section detail will need to be coordinated with the Water Utility and accommodate the ROW width, gravity and pressurized wastewater mains, reuse water mains and storm drainage mains.

~~E.~~I. The WMP is a guide for transmission main alignment and subject to formal and informal updates.

~~6.2.2~~6.2.3 Depth of Cover for Water Mains

The following table shall govern depth of cover for water main installations:

Table 6.2-B: Minimum Depth of Cover for Water Mains

Pipe Size	From Surface to Top of Pipe	
	UNDER UNPAVED AREAS	UNDER PROPOSED OR EXISTING PAVEMENT
12-in. and smaller	5 feet	42 inches
16-in.	-	5 feet
16-in. and larger	6 feet	-
20-in. and larger	-	6 feet

Notes:
[1] Additional depth of cover shall be required for low-lying areas where future drainage improvements are anticipated.

~~6.2.3~~6.2.4 Pipe and Fittings

A. Specifying the appropriate pipe material is the responsibility of the design engineer, based on the analysis of specific site and loading conditions, and pressure requirements. The minimum requirements in this Section are based on pipe size only, and in no way relieve the design engineer

of the responsibility of specifying the pipe material applicable to the specific project. Pipe gasket material shall be that recommended by the manufacturer for the specified pipe. Special attention shall be given by the design engineer for unique pipe fitting and pipe assembly situations.

B. Water pipe shall be a minimum of eight (8) inches in diameter. The standard pipe sizes that shall be used for water main lines are 8-in., 12-in., 16-in., 20-in., 24-in., 30-in., 36-in., and 42-in. pipes. Pipe sizes of 6-in., 10-in., 14-in., 18-in., 21-in., and 33-in. are considered non-standard by the City and may not be used for water main lines. A 6-in. pipe may be used for fire hydrant connections.

~~A.~~C. Water mains 16 inches~~"~~ and greater in diameter shall have preplanned points of connection of no less than 12 inches in~~"~~ diameter for distribution extensions. Tees with branch valves shall be used for preplanned connections.

~~B.~~D. See Table 6.2-C below for the City's minimum pipe materials, fittings, polywrap, thrust restraint, and embedment requirements, as a function of pipe size.

~~C.~~E. All fittings for pipe sizes less than 30 inches in diameter, including vertical and horizontal bends, shall have concrete thrust blocking. *See* City of Denton Standard Details.

F. All vertical and horizontal fittings and valves shall require restrained joints in addition to concrete thrust blocking. The joint restraints shall be designed as though there is no concrete thrust blocking, and the concrete thrust blocking shall be designed as though there are no joint restraints. Flanged tees should be used to secure all branch valves to fittings. Table 6.2-C below includes the minimum lengths of pipe to be restrained for 8-inch and 12-inch PVC water mains. For water lines greater than 12 inches in diameter, additional restrained joints may need to be installed beyond the fitting (i.e., may need to be installed on several pipe joints on each side of the fitting), depending on the required restrained length calculated. Restrained length calculations shall be included in the lay schedule in the material submittal package and shall use approved methods of joint restraint. *See* City of Denton Standard Details, specific product listings and Table 6.2-C below.

G. Geot~~-T~~echnical reports detailing soil conditions, that may affect the design, operation or maintenance of water infrastructure are required. Corresponding corrosion protection systems are to be provided for ~~Ductile Iron and Concrete Steel Cylinder~~metallic pipe materials including reports detailing the operation and maintenance of the corrosion protection systems. Corrosion system design reports must be included with record drawings.

Table 6.2-C: Restraint Lengths for Fittings and Bends

Pipe Size (inches)	Plugs, Tees, and Valves [1]	Bends [1]			
		90°	45°	22.5°	11.25°
8	88 ft	33 ft	14 ft	7 ft	4 ft
12	126 ft	45 ft	19 ft	9 ft	5 ft

Notes:
[1] Length to be restrained on each side of the bend or fitting. Assumptions: 1.5 safety factor, SP soil type, Type 4 trench.

Table 6.2-D: Minimum Requirements for Pipe and Fittings				
Pipe Size and Material	**Ductile Iron Fittings**	**~~Polywrap (Pipe & Fittings)~~Corrosion Protection**	**Thrust Restraint**	**Embedment**
8-IN. TO 12-IN.				
PVC (AWWA C900, DR – 14)	Mechanical joint; Compact or Full-Body	8-mil V-Bio Enhanced Polywrap (fitting only)	Wedge-action mechanical joint restraint glands, at fittings.	See drawings U201, U202, U203A, U203C in City of Denton Standard Details
16-IN. TO 20-IN.				
Ductile Iron, AWWA C151, Special Thickness Class 52, push-on-joints (where unrestrained; e.g.: American Flex-Ring joint)	Mechanical joint; Full-Body	8-mil V-Bio Enhanced Polywrap (inner layer), plus 4-mil cross-linked (outer layer) Bonded joint and Cathodic Protection (CP) System required	Wedge-action mechanical joint restraint glands, at fittings. Boltless Restrained connections (Example: American Flex-Ring joint), at several pipe joints either side of each fitting, depending on the required restrained length calculated.	See drawings U201, U202, U203A, U203C in City of Denton Standard Details
Reinforced Concrete Steel Cylinder, AWWA C303 Bar Wrapped	N/A	Bonded joint and Cathodic Protection (CP) System required	Full Circle Welded Joints required for thrust restraint	Contact Water Utilities Dept.
24-IN.				
Ductile Iron, AWWA C151, Special Thickness Class 52, push-on joints (where unrestrained; e.g.: American Flex-Ring joint)	Mechanical joint; Full-Body	8-mil V-Bio Enhanced Polywrap (inner layer), plus 4-mil cross-linked (outer layer) Bonded joint and Cathodic Protection (CP) System required	Wedge-action mechanical joint restraint glands, at fittings. Boltless Restrained connections (Example: American Flex-Ring joint), at several pipe joints either side of each fitting, depending on the required restrained length calculated.	Crushed Stone
Reinforced Concrete Steel Cylinder, AWWA C303 Bar Wrapped	N/A	Bonded joint and Cathodic Protection (CP) System required	Full Circle Welded Joints required for thrust restraint.	Contact Water Utilities Dept.
30-IN. AND LARGER				
Ductile Iron, Pressure Class 350; push-on joints (where unrestrained; e.g.: American Flex-Ring joint)	Mechanical joint; Full-Body	8-mil V-Bio Enhanced Polywrap (inner layer), plus 4-mil cross-linked (outer layer) Bonded joint and Cathodic Protection (CP) System required	Wedge-action mechanical joint restraint glands, at fittings. Boltless Restrained connections (Example: American Flex-Ring joint), at several pipe joints either side of each fitting, depending on the required restrained length calculated.	Crushed Stone
Reinforced Concrete Steel Cylinder, AWWA C303 Bar Wrapped	N/A	Bonded joint and Cathodic Protection (CP) System required	Full Circle Welded Joints required for thrust restraint.	Contact Water Utilities Dept.

~~6.2.4~~6.2.5 Connections

A. Methods of Connection

1. Tapping Sleeve and Valve

   Tapping sleeves with tapping valves shall be used whenever possible for connections to existing mains to avoid interruption of water services. *See* Figure 3.1 in Drawing PIAZ13 of the City of Denton Standard Details.

   a. As per AWWA C223, size-on-size taps are allowed up to 12 inches (e.g.: 12-in. x 12-in.)

   b. Taps on pipes 16 inches and larger must be approved in writing in advance by the City's Engineer after demonstrating the demand is greater than the availability from the distribution existing system. Taps to mains 16 inches and greater must be a minimum of 12 inches and utilize an isolation valve of the same size as the tap. Extensions may be reduced by fittings after the tapping valve. *See* Figure 3.2 in Drawing PIAZ13 of the City of Denton Standard Details.

   c. Connections to fire hydrant leads on existing mains 16 inches and larger may be allowed on a case-by-case basis after consultation and written approval by the City's Engineer.

   d. All water service lines, two (2) inches and smaller, require taps as per City of Denton Standard Details.

2. Cut-in Connection

   Cut-in connections are only allowed to existing mains larger than 12 inches, where a size-on-size connection is needed. *See* Figure 3.4 in Drawing PIAZ14 of the City of Denton Standard Details.

3. Main Extensions

   A new valve shall be installed at the point of connection for water main extensions. This will facilitate the testing and chlorination of the new main prior to its placement into service. *See* Figure 3.5 in Drawing PIAZ14 the City of Denton Standard Details.

   Note that the developer is responsible for all surface rehabilitation associated with connecting to the City's Water Utilities. Surface rehabilitation must match existing site conditions or better.

B. Flushing and Disinfection

Refer to all current City specifications and TCEQ requirements for Flushing and Disinfection.

~~Prior to making permanent connections to the distribution system, water distribution mains, valves, and appurtenances shall be adequately flushed and disinfected in accordance with the most current revision to AWWA C651, and bacteriological testing shall be completed to meet the standards established by the Water Utilities Department and 30 TAC Chapter 290. Additionally, heavily chlorinated water shall be flushed from all segments of the newly constructed mains before final connections are made.~~

~~Before commencement of construction of water distribution infrastructure, the contractor or engineer shall submit a flushing and disinfection plan for review by the Department of Water Utilities. At a minimum the plan shall describe:~~

~~A. Flushing procedures;~~

~~B. Hydraulic calculations to demonstrate adequate flushing velocities, or demonstrate conformance with the conditions outlined in AWWA C651 Table 3;~~

~~C. The method of chlorination;~~

~~D. Bacteriological sampling plan;~~

~~E. Dechlorinating procedures (Refer to AWWA C655); and~~

~~F. Disposal of chlorinated water and methods used to ensure discharges to surface waters or storm sewer systems do not exceed 0.1 mg/L total chlorine.~~

~~6.2.5~~6.2.6 Valves

A. Isolation Valves

1. Location

Isolation valves shall be provided to allow for the proper operation and maintenance of the water distribution system, and to ensure water quality can be maintained for each individual water customer connected to the system.

The location of valves needs to properly address the ability of the Department of Water Utilities to remove a water line from service to perform necessary repairs, while critically minimizing the interruption of service for fire protection and to customers. Isolation of any given section of water line should generally be able to be accomplished by closure of the least number of valves, as would generally be expected under good engineering design practices and utility engineering standards. The Department of Water Utilities reserves the right to require changes to proposed designs to satisfy these objectives.

The design engineer shall place valves on proposed water mains so they may be easily located in the future by operations and maintenance crews.

The following guidelines should be used by the design engineer in placement of isolation valves on proposed water mains:

a. Two (2) valves are to be installed at every main branch tee location, one (1) flanged to the branch of the tee and the other a mechanical joint connection on one (1) of the two (2) runs of the tee. *See* Figure 3.6 in Drawing PIAZ15 of the City of Denton Standard Details. Three (3) valves are to be installed at every cross location, each a mechanical joint connection.

b. Valves for line sizes 12 inches in diameter or less should not be spaced any farther apart than 1,000 feet. For city blocks that are longer than 1,000 feet between street intersections, placement of a valve will be required between street intersections.

c. Valves should be generally located so that no more than four (4) valves are required to isolate a section of main. *See* Figure 3.7 in Drawing PIAZ15 of the City of Denton Standard Details. For mains larger than 12 inches in diameter, valve spacing and placement shall be subject to alternate criteria approved by the City's Engineer.

d. All fire hydrant leads must be designed with a valve that is flanged to the main line. *See* Drawings W401A and W401B of the City of Denton Standard Details.

2. Specifications

Refer to Table 6.2-L and Standard Specifications 33 14 20 Resilient Seated (Wedge) Gate Valves and 33 14 21 AWWA Rubber-Seated Butterfly Valves.

Table 6.2-EEL: Isolation Valve Requirements

Size	4-in. to 12-in.	16-in. to 20-in.	24-in.	30-in.	36-in. or larger
Type	Gate Valve (AWWA C509 resilient-seat)	Gate Valve (AWWA C515 resilient-seat)	Gate Valve (AWWA C515 resilient-seat)	Gate Valve (AWWA C515 resilient-seat)	Gate Valve (AWWA C515 resilient-seat) or butterfly, to be determined by City on a case-by-case basis
Orientation	Vertical	Vertical	Vertical	Vertical or horizontal; to be determined by City on a case-by-case basis	Vertical or horizontal; to be determined by City on a case-by-case basis
Gear Operator Required	No	No	Yes	Yes	Yes
Vault Required	No	No	Yes	Yes	Yes
Bypass Required	No	No	No	Yes	Yes

3. Details

   Refer to Drawings W104, W105, W106A, W106B, and W601 of the City of Denton Standard Details.

B. Air Release Valves and Air/Vacuum-Air Release Valves

For water mains less than 16 inches in diameter in certain situations where the topography, remoteness, or some other hydraulic factor necessitates it, air release valves are required at local high points to facilitate automatic release of accumulated air.

For water mains 16 inches and larger, the City requires air/vacuum-air release valves at local high points to facilitate automatic release of accumulated air and to facilitate automatic prevention of vacuum conditions within the line. *See* Drawings W801 and W802 of the City Standard Details.

Manholes shall not be placed in sidewalks, pedestrian ramps, driveway approaches, or in the bottom or on the slopes of a drainage channel or drainage structure. Manholes shall be kept a minimum of 40 feet from any railroad track.

C. Pressure Reduction Valves and Pressure Sustaining Valves

Public pressure reduction valves and pressure sustaining valves are to be coordinated with and written approval obtained from the City's Engineer in consultation with the Field Operations division. Valves shall be located where they are accessible to City staff and located in a vault sized for the valve assemblies and staff access in unpaved areas of ROW and/or PUE. PUEs shall be sized considering the size of the vaults, depth of the water main, and site constraints, including, but not limited to, highways, creeks, railroads, existing and proposed structures, ingress and egress availability, topography, and ESAs.

D. Blowoff Valve Assemblies

Water mains 16 inches and larger shall be equipped with blowoff valve assemblies sized to facilitate 3 fps scouring velocities within the main, flushing and draining of the water main for maintenance. Assemblies are to be located at low points where sediment can accumulate and to ensure complete drainage of the main to allow for repairs to be completed on empty mains.

The discharge piping of the blowoff assembly must direct flushed water towards drainage infrastructure without causing flooding. Erosion prevention must be included in the design of the assembly and direction of discharged water. The location of the assemblies must be in a public ROW or utility easement in an unpaved area large enough for operation of the assembly.

~~6.2.6~~6.2.7 Dead-End Mains

A. Dead-end main situations should be avoided whenever possible, except for main extensions to neighboring property for future extension.

~~G.~~B. In lieu of dead-end mains, the design should loop through public ROW or a dedicated public utility easement (with adequate assurance of access and fencing prohibited) to another nearby water main using the same size pipe.

~~H.~~C. If a dead-end main situation is unavoidable, it shall be designed so that it may be periodically flushed of stagnant water by locating a fire hydrant or other flushing device near the main's end and past the last service connection. *See* City of Denton Standard Detail W603.

~~6.2.7~~6.2.8 Fire Hydrant Locations and Coverage

A. The design engineer should locate fire hydrants as close as possible to street intersections, but outside of the curb radius. This positioning of fire hydrants provides coverage along several streets. When spacing requirements necessitate the installation of fire hydrants between street intersections, they should be placed at the projection of lot lines between property owners. For main replacement projects in established neighborhoods, fire hydrants should be designed as close as possible to the old fire hydrant location, provided coverage is adequate. Neighborhood residents are familiar with the fire hydrant being at that location and normally expect a replacement fire hydrant to be placed at the same location. Fire hydrants are not to be installed closer than nine (9) feet to any wastewater main, manhole, or appurtenance.

B. Fire hydrant spacing shall comply with the 2021 IFC Appendix C Fire Hydrant Locations and Distribution, and be easily accessible by City staff and First Responders. *See* City of Denton Standard Details W401A and 401B, and Standard Specifications 33 14 40 Fire Hydrants. Fire hydrants shall be placed at a maximum of 500 feet apart in single-family residential areas and a maximum of 300 feet apart in all other areas, unless a closer spacing is required by the IFC.

~~6.2.8~~6.2.9 Meters and Meters Cans/Vaults

The City allows the following water meters, depending on the volume and nature of the customer flow demands:

Table 6.2-~~FFE~~: Allowable Water Meters

Service Size	Meter Size	Type	AWWA Standard
1-in.	⅝-in. x ¾-in.	Positive Displacement	AWWA C700

1-in.	¾-in. x ¾-in.	Positive Displacement	AWWA C700
1-in.	1-in.	Positive Displacement	AWWA C700
2-in.	1½-in.	Positive Displacement	AWWA C700
2-in.	2-in.	Positive Displacement	AWWA C700
4-in.	3-in. Tru/Flo	Compound	See City Standard Specification 33 14 18
4-in.	4-in. Tru/Flo	Compound	See City Standard Specification 33 14 18
6-in.	6-in. Tru/Flo	Compound	See City Standard Specification 33 14 18
6-in.	6-in. Protectus III Fire Service (Shall be used for combination of domestic and fire service)	Compound	See City Standard Specification 33 14 18
8-in.	8-in. Protectus III Fire Service (Shall be used for combination of domestic and fire service)	Compound	See City Standard Specification 33 14 18

Notes:
[1] Turbine meters shall be allowed for irrigation meters; not for domestic meters.
[2] Venturi meters shall be allowed when recommended by City Water Utilities based on Single-Family Equivalent calculations.
[3] Fire hydrant meters shall only be used for non-potable purposes.
[4] Vaults are required for all meters greater than two (2) inches.
[5] *See* Section 6.2.96.2.96.2.5.D for Furnishing and Installing meters.
[6] Non-standard sized water services are not allowed. Refer to the water service connection drawings on the City of Denton Standard Details.
[7] Sites that require an irrigation meter shall have two (2) separate service line connections onto the main; one (1) for the domestic meter, and the other for the irrigation meter.

A. Number of Meters

One (1) meter is required for each residential, commercial, or industrial service connection, in accordance with the Code of the City of Denton, Texas, Chapter 26, Article I, Sec. 26-9. An apartment building, condominium, manufactured housing community, or mobile home park may be considered a single commercial facility for the purpose of this section. The City's standard policy is that only one (1) meter for domestic use will be furnished to each lot. Exceptions to that policy are:

1. Multifamily, Ccommercial, industrial, or institutional sites shall have a separate irrigation meter from the domestic meter with a separate service line to the distribution main;
2. Multifamily developments with greater than 200 units shall be required to have two (2) domestic meters for redundancy and reliability of water service, where each meter is located on a different water main or separated by an inline valve. Note that Fire Code may require redundant (secondary) fire suppression connections;
3. Multi-building sites where the configuration or size of the site makes a single meter location impractical or infeasible;
4. Institutional Group I-2 Facilities as per IBC Sec. 308.3 and IPC Sec. 609; and
5. Submetering by the property owner to tenants of multifamily developments with a minimum of five (5) units per building (or by condominium associations to member) shall be done at the owner's expense, with privately purchased and maintained meters, and in accordance with the Public Utilities Commission 16 TAC Chapter 24 Subchapter I, as amended.

B. Sizing

In commercial and industrial projects, the design engineer shall consult with the owner or the MEP engineer to identify proposed sizes and locations for domestic water meters, fire sprinkler connections, and irrigation meters.

During Building Permit review, the City evaluates adequacy of meter size using Table E201.1, "Minimum Size of Water Meters, Mains and Distribution Piping Based on Water Supply Fixture Unit Values (w.s.f.u.)" of the version of the International Plumbing Code (IPC) as adopted by the City (copy included herein as Table 6.2-G~~Table 6.2-G~~). The City's Building Permit Plans Review uses the version of the International Residential Code as adopted by the City, Table P2903.6, "Water-Supply Fixture-Unit Values for Various Plumbing Fixture and Fixture Groups" (see Table 6.2-H~~Table 6.2-G~~) to estimate w.s.f.u. To facilitate review of the proposed meter size, the design engineer shall submit a tabulation of w.s.f.u.; a sample tabulation is provided herein in Table 6.2-J~~Table 6.2-I~~.

Contact the Water Utilities Department regarding criteria for sizing fire-rated master meters.

For commercial or industrial sites that utilize large amounts of water in their production process, the developer shall provide estimated peak daily demand. Meter to be sized to 1.25 times (1.25x) the peak daily demand.

The total service units for multifamily apartment projects with eight (8) or more units shall be determined by multiplying the total number of bedrooms in the multifamily apartment project by 0.26 Single-Family Equivalents (SFEs).

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Table 6.2-G: Minimum Size of Water Meters, Mains, and Distribution Piping based on water-supply fixture-unit (w.s.f.u) values

Meter and Service Pipe (inches)	Distribution Pipe (inches)	Maximum Development Length (feet)									
PRESSURE RANGE 30 TO 39 PSI		40	60	80	100	150	200	250	300	400	500
3/4	1/2[1]	2.5	2	1.5	1.5	1	1	0.5	0.5	0	0
3/4	3/4	9.5	7.5	6	5.5	4	3.5	3	2.5	2	1.5
3/4	1	32	25	20	16.5	11	9	7.8	6.5	5.5	4.5
1	1	32	32	27	21	13.5	10	8	7	5.5	5

Table 6.2-G: Minimum Size of Water Meters, Mains, and Distribution Piping based on water-supply fixture-unit (w.s.f.u) values											
3/4	1-1/4	32	32	32	32	30	24	20	17	13	10.5
1	1-1/4	80	80	70	61	45	34	27	22	16	12
1-1/2	1-1/4	80	80	80	75	54	40	31	25	17.5	13
1	1-1/2	87	87	87	87	84	73	64	56	45	36
1-1/2	1-1/2	151	151	151	151	117	92	79	69	54	43
2	1-1/2	151	151	151	151	128	99	83	72	56	45
1	2	87	87	87	87	87	87	87	87	87	86
1-1/2	2	275	275	275	275	258	223	196	174	144	122
2	2	365	365	365	365	318	266	229	201	160	134
2	2-1/2	533	533	533	533	533	495	448	409	353	311
PRESSURE RANGE 40 TO 49 PSI		**40**	**60**	**80**	**100**	**150**	**200**	**250**	**300**	**400**	**500**
3/4	1/2[1]	3	2.5	2	1.5	1.5	1	1	0.5	0.5	0.5
3/4	3/4	9.5	9.5	8.5	7	5.5	4.5	3.5	3	2.5	2
3/4	1	32	32	32	26	18	13.5	10.5	9	7.5	6
1	1	32	32	32	32	21	15	11.5	9.5	7.5	6.5
3/4	1-1/4	32	32	32	32	32	32	32	27	21	16.5
1	1-1/4	80	80	80	80	65	52	42	35	26	20
1-1/2	1-1/4	80	80	80	80	75	59	48	39	28	21
1	1-1/2	87	87	87	87	87	87	87	78	65	55
1-1/2	1-1/2	151	151	151	151	151	130	109	93	75	63
2	1-1/2	151	151	151	151	151	139	115	98	77	64
1	2	87	87	87	87	87	87	87	87	87	87
1-1/2	2	275	275	275	275	275	275	264	238	198	169
2	2	365	365	365	365	365	349	304	270	220	185
2	2-1/2	533	533	533	533	533	533	533	528	456	403
PRESSURE RANGE 50 TO 60 PSI		**40**	**60**	**80**	**100**	**150**	**200**	**250**	**300**	**400**	**500**
3/4	1/2[1]	3	3	2.5	2	1.5	1	1	1	0.5	0.5
3/4	3/4	9.5	9.5	9.5	8.5	6.5	5	4.5	4	3	2.5
3/4	1	32	32	32	32	25	18.5	14.5	12	9.5	8
1	1	32	32	32	32	30	22	16.5	13	10	8
3/4	1-1/4	32	32	32	32	32	32	32	32	29	24
1	1-1/4	80	80	80	80	80	68	57	48	35	28
1-1/2	1-1/4	80	80	80	80	80	75	63	53	39	29
1	1-1/2	87	87	87	87	87	87	87	87	82	70
1-1/2	1-1/2	151	151	151	151	151	151	139	120	94	79
2	1-1/2	151	151	151	151	151	151	146	126	97	81
1	2	87	87	87	87	87	87	87	87	87	87
Meter and Service Pipe (inches)	**Distribution Pipe (inches)**	**Maximum Development Length (feet)**									
1-1/2	2	275	275	275	275	275	275	275	275	247	213
2	2	365	365	365	365	365	365	365	329	272	232
2	2-1/2	533	533	533	533	533	533	533	533	533	486
PRESSURE RANGE OVER 60 PSI		**40**	**60**	**80**	**100**	**150**	**200**	**250**	**300**	**400**	**500**
3/4	1/2[1]	3	3	3	2.5	2	1.5	1.5	1	1	0.5

Table 6.2-G: Minimum Size of Water Meters, Mains, and Distribution Piping based on water-supply fixture-unit (w.s.f.u) values

3/4	3/4	9.5	9.5	9.5	9.5	7.5	6	5	4.5	3.5	3
3/4	1	32	32	32	32	32	24	19.5	15.5	11.5	9.5
1	1	32	32	32	32	32	28	28	17	12	9.5
3/4	1-1/4	32	32	32	32	32	32	32	32	32	30
1	1-1/4	80	80	80	80	80	80	69	60	46	36
1-1/2	1-1/4	80	80	80	80	80	80	76	65	50	38
1	1-1/2	87	87	87	87	87	87	87	87	87	84
1-1/2	1-1/2	151	151	151	151	151	151	151	144	114	94
2	1-1/2	151	151	151	151	151	151	151	151	118	97
1	2	87	87	87	87	87	87	87	87	87	87
1-1/2	2	275	275	275	275	275	275	275	275	275	252
2	2	365	368	368	368	368	368	368	368	318	273
2	2-1/2	533	533	533	533	533	533	533	533	533	533

Notes:

[1] Minimum size of building supply is ¾-in. pipe.

[2] User shall follow the most recently adopted code; above table was the most recent version at the time of publication of this Manual.

Source: 2021 International Plumbing Code – Table E201.1

Table 6.2-H: Water-supply fixture-unit (w.s.f.u) values for Various Plumbing fixtures and Fixture Groups

Type of Fixtures or Group of Fixtures	Load in w.s.f.u. values		
	HOT	COLD	COMBINED
Bathtub (with/without overhead shower head)	1.0	1.0	1.4
Clothes washer	1.0	1.0	1.4
Dishwasher	1.4	—	1.4
Full-bath group with bathtub (with/without shower head) or shower stall	1.5	2.7	3.6
Half-bath group (water closet and lavatory)	0.5	2.5	2.6

Table 6.2-H: Water-supply fixture-unit (w.s.f.u) values for Various Plumbing fixtures and Fixture Groups			
Hose bibb (sillcock)[1]	—	2.5	2.5
Kitchen group (dishwasher and sink with/without garbage grinder)	1.9	1.0	2.5
Kitchen sink	1.0	1.0	1.4
Laundry group (clothes washer standpipe and laundry tub)	1.8	1.8	2.5
Laundry tub	1.0	1.0	1.4
Lavatory	0.5	0.5	0.7
Shower stall	1.0	1.0	1.4
Water closet (tank type)	—	2.2	2.2

Notes:

[1] The fixture unit value 2.5 assumes a flow demand of 2.5 GPM, such as for an individual lawn sprinkler device. If a hose bibb/sill cock will be required to furnish a greater flow, the equivalent fixture-unit value may be obtained from this table or Table P2903.6(1).

[2] Supply loads in the building water-distribution system shall be determined by total load on the pipe being sized, in terms of w.s.f.u., as shown in Table P2903.6, and gallons per minute (GPM) flow rates [see Table P2903.6(1)]. For fixtures not listed, choose a w.s.f.u. value of a fixture with similar flow characteristics.

[3] For SI units: 1 GPM = 3.785 Liters per minute (L/m).

[4] User shall follow the most recently adopted code. The above table was the most recent version at the time of publication of this Manual.

Source: 2021 International Residential Code – Table P2903.6

Table 6.2-I: Load Values assigned to Fixtures [1]					
Fixture	**Occupancy**	**Type of Supply Control**	**Load in w.s.f.u values**		
			COLD	**HOT**	**COMBINED**
Bathroom group	Private	Flush tank	2.7	1.5	3.6
Bathroom group	Private	Flushometer-valve	6.0	3.0	8.0

Table 6.2-I: Load Values assigned to Fixtures [1]					
Bathtub	Private	Faucet	1.0	1.0	1.4
Bathtub	Public	Faucet	3.0	3.0	4.0
Bidet	Private	Faucet	1.5	1.5	2.0
Combination fixture	Private	Faucet	2.25	2.25	3.0
Dishwashing machine	Private	Automatic	—	1.4	1.4
Drinking fountain	Offices, etc.	⅜-in. valve	0.25	—	0.25
Kitchen sink	Private	Faucet	1.0	1.0	1.4
Kitchen sink	Hotel, restaurant	Faucet	3.0	3.0	4.0
Laundry trays (1 to 3)	Private	Faucet	1.0	1.0	1.4
Lavatory	Private	Faucet	0.5	0.5	0.7
Lavatory	Public	Faucet	1.5	1.5	2.0
Service sink	Offices, etc.	Faucet	2.25	2.25	3.0
Shower head	Public	Mixing valve	3.0	3.0	4.0
Shower head	Private	Mixing valve	1.0	1.0	1.4
Urinal	Public	1-in. flushometer-valve	10.0	—	10.0
Urinal	Public	¾-in. flushometer-valve	5.0	—	5.0
Urinal	Public	Flush tank	3.0	—	3.0
Washing machine (8-lb.)	Private	Automatic	1.0	1.0	1.4
Washing machine (8-lb.)	Public	Automatic	2.25	2.25	3.0
Washing machine (15-lb.)	Public	Automatic	3.0	3.0	4.0
Water closet	Private	Flushometer valve	6.0	—	6.0
Water closet	Private	Flush tank	2.2	—	2.2
Water closet	Public	Flushometer valve	10.0	—	10.0
Water closet	Public	Flush tank	5.0	—	5.0
Water closet	Public or private	Flushometer tank	2.0	—	2.0

Notes:

[1] For fixtures not listed, loads should be assumed by comparing the fixture to one listed using water in similar quantities and at similar rates. The assigned loads for fixtures with both hot and cold water supplies are given for separate hot and cold water loads and for total load. The separate hot and cold water loads are three-fourths of the total load for the fixture in each case.

[3] For SI units: 1 inch = 25.4 mm, 1 pound = 0.454 kg.

[4] User shall follow the most recently adopted code. The above table was the most recent version at the time of publication of this Manual.

Source: 2021 International Plumbing Code – Table E103.3(2)

Table 6.2-J: Sample w.s.f.u Tabulation			
Fixture	**Quantity**	**Load Values, in Total w.s.f.u (each)**	**Total Fixture Units**
Water Closet (Public; Flush Valve)	9	10.0	90
Water Closet (Public; Flush Tank)	3	5.0	15
Urinal (Public; ¾-in. Flush Valve)	5	5.0	25

Table 6.2-J: Sample w.s.f.u Tabulation			
Lavatory (Public)	10	2.0	20
Kitchen Sink (Hotel, Restaurant)	2	4.0	8
Service Sink	1	3.0	3
Shower Head (Private)	1	1.4	1.4
		Total	**162.4**

Table 6.2-K: Land Use and Service Units/SFE Equivalencies

Meter Type	Meter Size	Typical Land Use	Single-Family Equivalents (SFEs)
Positive Displacement	⅝-in. x ¾-in.	Residential – Single-Family (Building less than 1,300 sq. ft. per lot size less than 6,000 sq. ft.)	0.5
Positive Displacement	⅝-in. x ¾-in.	Residential – Single-Family	1.0
Positive Displacement	¾-in. x ¾-in.	Residential / Commercial	1.5
Positive Displacement	1-in.	Residential / Commercial	2.5
Positive Displacement	1½-in.	Commercial	5.0
Positive Displacement	2-in.	Commercial	8.0
Compound	3-in.	Commercial / Industrial	22.5
Compound	4-in.	Commercial / Industrial	50.0

Notes:

~~[1] The total service units for multifamily apartment projects with eight (8) or more units shall be determined by multiplying the total number of bedrooms in the multifamily apartment project by 0.26 Single-Family Equivalents (SFEs).~~

Source: City of Denton Approved Meter Manufacturer's Specifications;
City of Denton Code of Ordinances Section 26-218 - Water and Wastewater Facilities - Exhibit F

C. Location

Water meters and meter cans and vaults shall be placed within a City ROW, Public Utility Easement or Public Water Easement. Placement shall also satisfy the following requirements:

1. Located as close as possible to the public water main;
2. Easily accessible to City of Denton employees; and
3. Located in an unpaved area that does not conflict with vehicular or pedestrian traffic.

D. Furnishing and Installing

All meters two (2) inches and smaller, shall be furnished and installed by City Water Utilities for fees per the current Fee Schedule. All meter assemblies three (3) inches and larger and their associated vaults, shall be furnished and installed by Contractor at their expense and inspected by Public Works Inspection and City Water Utilities.

E. Details

Details of the meter can assemblies for meter sizes two (2) inches and smaller are shown in the City of Denton Standard Details.

Details of the meter vault assemblies for meter sizes three (3) inches and larger are shown in the City of Denton Standard Details.

F. Backflow Prevention

Note that this section of the DCM, 6.2.59.(F) Backflow Prevention will be superseded and void upon the adoption of a formal City Ordinance governing backflow prevention assembly requirements in the near future.

Backflow Prevention Assemblies are required in accordance with the International Plumbing Code, 2021 IFC, 30 TAC § 290.44. Backflow Prevention Assemblies must be utilized as follows:

1. At each dedicated fire line connection. A flanged fire line valve shall be required to connect to the tee located on the main line and a fire line valve shall be required outside the downstream side of the vault or ROW line whichever applies;
2. After each meter of any site served by redundant domestic meters;
3. At facilities supporting Recreational Vehicle (RV) connections for the purpose of flushing waste tanks;
4. At all services outside City limits, in accordance with 30 TAC § 290.47(f)); and
5. At all properties that have an auxiliary water source. These properties must protect connections to the public water system using a reduced pressure backflow assembly (RPBA).

Backflow prevention devices shall be placed at the ROW or an easement line adjacent to the connection to the public water system.

6.2.96.2.10 Underground Utility Crossing

Water mains shall be separated from wastewater mains as set forth in 30 TAC § 290.44(e) - Location of Waterlines, as amended.

Where water mains are laid under or over another buried utility line or underground facility (i.e., storm drain, culvert boxes, franchise utilities, etc.), special requirements may be necessary for the protection of the water main. Table 6.2-LTable 6.2-L provides requirements for different crossing situations. This table is not a replacement for separation requirements for sewer and water lines as governed by 30 TAC §§ 217.53 and 290.44, respectively.

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Table 6.2-L: Utility Crossing Requirements

Water Utility	Crossing	Utility Line Size (in.)	Separation (feet)	Special Requirement
New/existing Water	Under	< 24	≥ 2	None
New/existing Sewer	Under	< 24	≥ 2	None

Table 6.2-L: Utility Crossing Requirements				
New/existing Water	Under	24 to 42	≥ 2	None
New/existing Sewer	Under	24 to 42	≥ 2	None
New Water	Under	> 42	≥ 2	Encased in 150±psi pressure class pipe
Existing Water	Under	> 42	≥ 2	Encased in split steel casing
New Sewer	Under	> 42	≥ 2	Encased in 150±psi pressure class pipe
Existing Sewer	Under	> 42	≥ 2	Encased in split steel casing
New Water	Under	≥ 10	≥ 2	Cased in steel pipe
Existing Water	Under	≥ 10	≥ 2	Cased in split steel pipe
New Sewer	Under	≥ 10	≥ 2	Cased in steel pipe
Existing Sewer	Under	≥ 10	≥ 2	Cased in split steel pipe
New/existing Water	Over	< 24	≥ 2	None
New/existing Sewer	Over	< 24	≥ 2	None
New/existing Water	Over	≥ 24	≥ 2	None
New/existing Sewer	Over	≥ 24	≥ 2	None

A. To minimize crossing impacts, crossings must be perpendicular, if possible.

B. Utility crossings with less than two (2) feet of separation require a design deviation request (which will include special requirements) after providing a thorough analysis detailing physical and economic factors involved.

C. Pursuant to the Code of the City of Denton, Texas, Chapter 25, Article II, Sec. 25-80-Facility Size and Locations, all ROW user facilities are required to maintain a minimum separation of 24 inches from all City utility system facilities. If a ROW user may encounter a hardship due to this requirement, the ROW user may request a design deviation as detailed in Section 8 of this Manual.

D. Split-steel casing shall follow sizing requirements of pressure-rated casing.

E. See City Standard Specification Section 33 05 07 Steel Casing Pipe.

F. Casing spacers shall be placed not more than five (5) feet apart.

G. Encasement shall be extended a minimum of three (3) feet beyond the edge of the utility or facility to be crossed. Water mains that cross utility lines in private easements must adhere to the requirements of the easement owner, as well as those listed above.

~~6.2.10~~6.2.11 Fence or Wall Crossings

A. Water mains should be routed to avoid entering private property. In circumstances where it is impractical to avoid doing so, provisions are required to allow City staff to inspect, maintain, and repair its infrastructure. Water mains crossing fences will require a design deviation request as per Section 8 of this Manual, to be reviewed by the City's Engineer, after thorough consideration of the physical and economic factors involved. Design deviations may require additional provisions beyond this Manual.

B. Water mains crossing under privacy fencing (wood, chain-link, or plastic) shall not require any special protection.

C. Water mains crossing under other types of fencing will require the fence to be constructed of easily removable panels or have gates that can be removed from the easement.

D. Water mains may not cross under retaining walls.

E. There must be at least two (2) feet of vertical separation between a water line and any utility or storm drain crossing it.

~~6.2.11~~6.2.12 Highway Crossings

Crossings of State or County-controlled roads shall require the review and approval of the appropriate regulatory agency after consultation with the City's Engineer regarding crossing location. Crossings shall meet the requirements provided by the controlling agency and by the City of Denton Standards. In the event of different requirement levels for the same item, the more stringent standard shall apply. Crossing locations must be easily and directly accessible on each side of the highway. Additional access easements and installation of all-weather road surface may be required. The City of Denton shall have final say in the location, criteria and standards of highway crossings considering access, maintenance and repairs.

~~6.2.12~~6.2.13 Railroad Crossings

The design engineer shall, prior to the design of any railroad crossing, contact the appropriate railroad company and regulatory agency to determine if there are any special requirements. Crossings shall be discussed with and must be approved in writing by the City's Engineer. In the event the City of Denton Design Criteria are more stringent than those of the Railroad Company or regulatory agency, the City's standards shall apply. Crossing locations must be easily and directly accessible on each side of the railroad. Additional access easements and installation of all-weather road surface may be required. The City of Denton shall have final say in the location, criteria and standards of ~~railraod~~railroad crossings considering access, maintenance and repairs.

~~6.2.13~~6.2.14 Creek Crossings

Where a water main is laid under any flowing stream or semi-permanent body of water, such as a marsh or pond, or an identified ESA (*See* DDC 7.4) the water main shall be installed in a separate watertight encasement pipe, with valves on each side of the crossing to allow for the isolation and testing of that portion of the water main to determine if there are any leaks, and to facilitate future repairs after consultation with the City's Engineer.

A primary consideration in the design of creek crossings is the prevention of soil erosion in the areas of trench backfill. The design engineer shall determine the need and limits of any special embedment, and determine and specify the limits for specialized backfills. Crossing locations must be easily and directly accessible on each side of the creek. Additional access easements and installation of all-weather road surface may be required. The City of Denton shall have final say in the location, criteria and standards of creek crossings considering access, maintenance and repairs.

~~6.2.14~~6.2.15 Elevated Crossings

Elevated crossings are not permitted for water mains except for special cases approved by the City's Engineer. Design requirements for approved elevated crossings shall be tailored to the specific project characteristics.

~~6.2.15~~6.2.16 Tunneling, Boring, Jacking and Casing

Tunneling, boring, jacking and casing are methods used for water line placement under restrictive

conditions when open-cut construction is not allowed. Only straight pipe alignments for both horizontal and vertical alignment are allowed.

Design engineers should consider the location, size, and depth of boring, tunnelling and receiving pits when choosing the beginning and ending stations for boring or tunnelling. A typical bore pit is between 35 and 40 feet in length to accommodate the boring machine and one (1) joint of pipe. Width of the bore pit can vary depending on the depth and size of pipe, with the narrowest width being approximately 15 feet. Tunnelling pits can vary greatly in size depending on the depth and size of the tunnel to be excavated. Additional size and spacing requirements may be required as outlined in DDC 7.4 when working adjacent to confirmed ESAs. The preferred location for the bore or tunnel pit is the lower elevation end of the bore or tunnel; allowing any groundwater and/or boring slurry to drain from the tunnel into the bore or tunnel pit. The water can then be removed by pumping.

A. Steel casing pipe, where required for open-cut or other than open-cut installation, shall conform to ~~the~~ City Standard Specification 33 05 07 Steel Casing Pipe, and be subject to the following guidelines:
   1. Within Railroad ROW – the casing pipe size shall be sufficient to accommodate the outside diameter (OD) of the carrier pipe bell of at least one City standard size greater than what is required (see 6.2.4.B). Additionally, the casing pipe size must accommodate any external joint restraint fittings required to restrain the carrier pipe. The annular space between the carrier pipe and casing pipe shall not be grouted.
   2. All other situations – the casing pipe size shall be sufficient to accommodate the OD of the carrier pipe bell plus an additional four (4) inches of clear space. The carrier pipe shall be restrained through grout applied to the annular space between the casing and carrier pipe so external pipe restraints are not required.

B. Carrier pipes through casing shall be restrained as follows:
   1. Segmented PVC and DIP shall be restrained with either external restraint fittings applied to push-on bell and spigot pipe or by utilizing manufactured restrained joint pipe.
   2. HDPE shall be restrained through fused joints.
   3. Concrete steel cylinder pipe shall be restrained through welded joints.

All carrier pipes shall be supported with approved spacers and casing end seals. Refer to City of Denton Standard Detail U208A and the current City approved Materials Submittal List.

Large diameter (48 inches or greater) or long length bores or tunnels (200 feet or greater) may require tunnel liner plate instead of steel casing. These situations shall require design calculations to identify the type and gage of tunnel liner plate to be utilized per Specification 33 05 08 Tunnel Liner Plate.

~~6.2.16~~6.2.17 Existing Water Main Replacement

A. Whenever an existing main is to be replaced by a new main, use the following guidelines for alignment and design:
   1. The new line should be located as near as possible to the existing line; while allowing the existing line to remain in service, until the new line is ready to be put into service.
   2. If the existing line is in or next to a roadway, the new line should be placed under existing pavement, not behind the curb in the parkway area.

3. The new line should be designed to utilize the existing metering locations where possible.

B. The size of the new line should match the size of the existing line. If the existing line is a non-standard size (i.e., 6-in. or 10-in.) then the new line should be sized for the next larger standard size. The design engineer shall perform field investigations to determine pavement condition over the existing main. The pavement may have been patched due to breaks in the existing main over the years. Based on field investigations, the design engineer shall include additional quantities for pavement replacement, if necessary.

~~6.2.17~~6.2.18 Requirements for Abandoning Water Mains

The design engineer should note the limits and appropriate conditions for the abandoning of existing water mains which are to be replaced by the construction of any proposed water mains.

The design engineer should also make allowances in the design to provide for the existing and proposed mains to be in service simultaneously, until all customer services are transferred from the old main to the new main with minimum interruption of service. If the construction of a proposed main necessitates the abandoning of the existing main prior to the new main's placement into service, then provisions for a temporary water main with services must be addressed by the design.

~~**A. Typically, abandoned lines may be left in place with only the ends being plugged with grout or concrete. However, the City may require special abandonment actions including, but not limited to, filling the abandoned water main with grout, removal and proper disposal of all above ground appurtenances, and removal and proper disposal of the abandoned pipe.**Replacement Mains~~

~~On occasions when connecting to an existing main, it may be desirable to have an additional valve on the existing main. In this situation, the design engineer should consider using a cut-in connection with a tee and valve being cut into the existing main. *See* Figure 3.4 in Drawing PIAZ14 of the City of Denton Standard Details.~~

~~**B.** Extension Mains~~

~~A new valve shall be installed at the point of connection for water main extensions. This will facilitate the testing and chlorination of the new main prior to its placement into service. *See* Figure 3.5 in Drawing PIAZ14 the City of Denton Standard Details.~~

~~**C.** Fire Hydrants~~

~~A new valve shall be installed at the point of connection for water main extensions. This will facilitate the testing and chlorination of the new main prior to its placement into service. *See* Figure 3.5 in Drawing PIAZ14 the City of Denton Standard Details.~~

6.2.19 Water Treatment Plants, Ground Storage Tanks, ~~Elevated Storage Tanks~~ESTs, Pressure Tanks, and Booster Pump Stations

If new public water treatment plants (WTPs), ground storage tanks (GSTs), ~~elevated storage tanks (~~ESTs~~)~~, pressure tanks and/or Booster Pump Stations are needed to support a development, the design shall be directed by the Water Utility considering the needs of the development and the Water Utility System.

6.3 Wastewater Design ~~Guidelines~~Criteria

6.3.1 Estimated Wastewater Flows

For sewers in new developments, sewer lines and lift stations shall be designed to accommodate the projected buildout flows from all residential, commercial, industrial, or institutional sources upstream of the proposed sewer improvement. Figure: 30 TAC § 217.32(a)(3) Table B.1. - Design Organic Loadings and Flows for a New Wastewater Treatment Facility (*see* excerpted information in Table 6.3-A) shall be used as a guide to generate wastewater flows. However, minimum flow capacity for sizing of sewers for peak flow condition shall not be less than the results of the following calculation procedures:

A. Delineate the wastewater drainage area that will drain into the sewer main or lift station. Include all upstream offsite areas.

B. For the development site, use the following design parameters:
   1. Table 6.3-A~~Table 6.3-A~~ to generate the wastewater loading by type of use.
   2. 3.2 capita per lot for single-family.
   3. 2.5 capita per unit for multifamily.
   4. Apply a 4.0 multiplier to the average daily flow to determine the peak flow.

C. For undeveloped upstream areas, use the following design parameters:
   1. 4 lots per acre.
   2. 3.2 capita per lot.
   3. Average daily flow of 90 GPCD.
   4. Apply a 4.0 multiplier to the average daily flow to determine the peak flow.

D. For developed residential upstream areas, use the following design parameters:
   1. Count number of single-family lots.
   2. Obtain number of multifamily units (available through DCAD)
   3. 3.2 capita per lot for single-family.
   4. 2.5 capita per unit for multifamily.
   5. Average daily flow of 90 GPCD
   6. Apply a 4.0 multiplier to the average daily flow to determine the peak flow

E. For developed non-residential upstream areas, use the following design parameters:
   1. Average daily flow of 1,500 GPD per acre.
   2. Apply a 4.0 multiplier to the average daily flow to determine the peak flow.

For replacement of existing sewers and construction of parallel sewers for additional capacity, wastewater flow data may be provided by the City from data generated by City sewershed computer models. The cost for modeling a project's impact with the City's collection system model will be the responsibility of the developer and paid to the City.

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Proposed impacts to the City's system determined to, or likely to, cause (through hydraulic modeling or other analysis) these limits to be exceeded, are prohibited without additional improvements to the public system to address the capacity deficiency~~so the system can be operated within these parameters~~.

Table 6.3-A: Design Flows for a New Wastewater Treatment Facility

Source	Remarks	Daily Wastewater Flow (Gal. per person)[1]
Municipality	Residential	75 - 100
Subdivision	Residential	75 - 100
Trailer Park [2] (Transient)	2½ Persons per Trailer	50 - 60
Mobile Home Park [2]	3 Persons per Trailer	50 - 75
School	Cafeteria & Showers Cafeteria/ No Showers	20 15
Recreational Parks	Overnight User Day User	30 5
Office Building or Factory	Facility must be designed for the largest shift	20
Hotel/Motel	Per Bed	50 - 75
Restaurant	Per Meal	7 - 10
Restaurant with bar or cocktail lounge	Per Meal	9 - 12
Hospital	Per Bed	200
Nursing Home	Per Bed	75 - 100
Alternative Collection Systems, e.g., septic tanks	Per Capita	75

Notes:

[1] City of Denton requires usage of the highest number of the TCEQ ranges.

[2] At the time of updating this Manual, the TCEQ is evaluating criteria for tiny homes, and should be consulted as appropriate.

Source: TCEQ Rules - 30 TAC §217.32(a)(3), Table B.1

6.3.2 Size and Slope of Sewers

After the design engineer has determined the wastewater flows per Section 6.3.1 of this Manual, the sewer size can be determined using the following criteria. However, no sewer, other than service laterals and force mains, shall be less than eight (8) inches in diameter.

The size and grade of the proposed sewer shall be evaluated using Manning's formula

$$V = 1.49/n\ (R)^{0.67}\ (S)^{0.50} \qquad \textbf{[Eqn. 6.1]}$$

Where:

V = velocity (in fps)

n = Manning's coefficient of roughness; minimum 0.013

R = hydraulic radius (feet)

S = slope of energy grade line (feet per foot)

Proposed sewers shall be designed with slopes sufficient for velocity of three (3.0) fps, with a minimum required velocity of two (2.0) fps. The minimum acceptable Manning's "*n*" factor for design shall be 0.013, which takes into consideration the slime, grit and grease layers that will affect hydraulics or hinder flow as the pipe matures. The sewer pipe grades shown in Table 6.3-B are based on an "*n*" value of 0.013 and are the minimum acceptable slope for sewer lines.

Table 6.3-B: Minimum and Maximum Pipe Slopes

Size of Pipe - ID (inches)	Minimum Slope (%)	Maximum Slope (%)	Capacity Flowing Full at Min. Slope (MGD)
8	0.335	8.40	0.45
10	0.25	6.23	0.71
12	0.20	4.88	1.03
15	0.15	3.62	1.62
18	0.115	2.83	2.25
21	0.095	2.30	3.07
24	0.08	1.93	4.14
7	0.07	1.65	4.91
30	0.06	1.43	6.23
33	0.055	1.26	7.66
36	0.045	1.12	9.17

The capacity of the sewer pipe flowing full shall be computed by the following equation:

$$C = 0.299/n\ (D)^{2.67}\ (S)^{0.50} \qquad \textbf{[Eqn. 6.2]}$$

Where: C = capacity (million gallons per day-MGD)

n = Manning's coefficient of roughness; minimum 0.013

D = inside diameter (feet)

S = slope of the energy grade line (feet per foot)

Sewer mains shall be designed to convey peak flow at no more than 80% of full pipe capacity at system buildout.

A. High Velocity Protection

Where velocities greater than 10 fps will occur when a pipe flows full, based on Manning's Equation and an "n" value of 0.013, restrained joint pipe or external restraint systems must be utilized.

6.3.3 Sewer Alignment

Design engineers shall be guided by the following in the alignment of wastewater lines:

A. Collection system extensions must follow topographical depressions and extend to the upstream drainage shed, considering storm drainage improvements. Crossing into other drainage sheds require written approval from City's Engineer;

~~A.~~B. For new construction in areas not served, sewer mains shall be laid straight between manholes. No horizontal or vertical bends are allowed between manholes;

~~B.~~C. Avoid shifting mains from one side of the ROW to the other side of the ROW between street intersections;

~~C.~~D. Where the bypass of existing flows is feasible, it is recommended that replacement mains be constructed horizontally in the same trench; ~~and~~

E. Except for pipe crossings, no franchise utility shall be installed within five (5) feet of a sewer main;

and

~~D.~~F. Vertically parallel wastewater mains require written approval from the City's Engineer. Details regarding main access must be planned out including but not limited to the dedicated of easements or City ROW to ensure ability to access the mains, calculations and details showing distances from the main that other utilities may not be placed to preserve ability to access.~~.~~

~~E.~~

6.3.4 Sewer Main Depth and Recommended Cover

A. Minimum depth for the design of sewer mains shall be determined by providing a 2% grade for the lateral from the center of the house or building to the center of the proposed main and including an additional two (2) feet drop. Therefore, for a house 100 feet from the proposed sewer main, the designed depth of the main shall be at least four (4) feet below the FFE of the house since:

2 feet + (2% of 100 feet) = 4 feet **[Eqn. 6.3]**

The lateral also must have at least two (2) feet of cover at its shallowest point. The design engineer is responsible for ensuring sufficient depth and grade is maintained to serve all building sites in the sewer shed.

B. ~~The maximum depth of sewer mains is 30 feet.~~Recommended cover for all sewer mains is four (4) feet to six (6) feet. Minimum cover shall be three (3) feet and six (6) inches or 3-½ feet. Any main approved to have less than minimum cover shall be encased in Class "B" embedment per City Standard Specifications. *See* Drawing U204 of the City of Denton Standard Details.

When establishing depth for proposed wastewater mains, design engineers shall consider the impact of proposed water and drainage improvements especially on service laterals that cross those improvements to connect to the wastewater main.

~~The maximum depth of sewer mains is 30 feet.~~

C.

~~6.3.5 Recommended Cover~~

~~Recommended cover for all sewer mains is four (4) feet to six (6) feet. Minimum cover shall be three (3) feet and six (6) inches or 3-½ feet. Any main approved to have less than minimum cover shall be encased in Class "B" embedment per City Standard Specifications. *See* Drawing U204 of the City of Denton Standard Details.~~

~~When establishing depth for proposed wastewater mains, design engineers shall consider the impact of proposed water and drainage improvements especially on service laterals that cross those improvements to connect to the wastewater main.~~

~~6.3.6 Sewer Laterals~~

~~A. Water Utilities, Field Operations, or Engineering and Planning staff reserve the right to permit utility-supervised connections to the collection system by non-City staff. Note that the developer will be responsible for all surface rehabilitation associated with connecting to the City's Water Utilities. Surface rehabilitation must match existing site conditions or better.~~

~~B. Laterals may not serve more than one (1) lot.~~

~~C. Minimum lateral sizes from the sewer main to the public cleanout are:~~

~~1. 4-in. minimum for single-family~~

~~2. 6-in. minimum for residential duplex, triplex, and quadplex~~

~~3. 6-in. minimum for local retail, light commercial, apartment, manufacturing and industrial~~

~~D. Single-way clean-outs shall be provided on laterals at the public easement or ROW line. Double-way cleanouts are not allowed. *See* Drawings S403 and S404 of the City of Denton Standard Details.~~

~~E. Manholes shall be provided for lateral connections when the lateral pipe diameter is equal to the main sewer pipe diameter or if the lateral is eight (8) inches in diameter or larger.~~

~~F. Laterals shall be constructed to the property line and shall be located at a point five (5) feet downstream from the center of the lot on unimproved property. For improved property, design engineers should use technical judgement in lateral placement.~~

~~G. Preferred grade for lateral construction within the ROW/PUE is 2%. Laterals within ROW/PUE shall not be designed with less than 1% grade.~~

~~6.3.7~~6.3.5 Gravity and Force Main Sewer Pipe Material

Gravity and Force Main sewer pipe shall meet the following criteria unless special circumstances require an alternative and is approved by the City's Engineer. Slope of grade across cover shall be a maximum of 4H:1V.

Table 6.3-C: Minimum and Maximum Pipe Slopes

Pipe Diameter	Application	Pipe Material
8-in. to 12-in.	Gravity	PVC – ASTM D3034, SDR 26; HDPE – ASTM D3350, DR-17
15-in.	Gravity	PVC – ASTM D3034, SDR 26
18-in. to 24-in.	Gravity	PVC – ASTM F 679, PS115; Fiberglass Reinforced Plastic – ASTM D3262
6-in. to 60-in.	Force Main	HDPE – ASTM D3350, DR-13.5; DIP – AWWA C150/C151, CL52 or PC 350, ~~epoxy interior lining~~

A. For gravity sewer pipe sizes over 24 inches in diameter, design calculations and pipe selection shall be submitted by the development design engineer for review. Approvals will be provided on a project specific basis.

B. Force main sewer pipe shall be designed to meet the working and surge pressure requirements of the specific application. Design calculations and pipe selection shall be submitted by the development design engineer for review.

C. Different pipe materials shall not be mixed between manholes. If it is anticipated that a mixing of materials will occur, the design engineer shall design a manhole at the point of transition of pipe materials. For previously placed stub-out of a material other than PVC pipe, design engineer shall add a note to the plans calling for removal of the stub-out or change the material of the proposed pipe for that section of pipe between manholes.

~~6.3.8~~6.3.6 Sewer Pipe Embedment

The types of embedment and backfill for sewer mains are shown in Drawings U201, U202, U203A, and U203C of the City of Denton Standard Details. Embedment requirements shall be based on sewer mains under proposed pavement, unpaved areas and existing pavement.

~~6.3.9~~6.3.7 Manholes

Manholes constructed on existing or proposed sewer lines shall be sized as follows:

Table 6.3-D: Manhole Sizing

Pipe Diameter	Manhole Diameter
8-in. to 12-in.	4.0 feet (For depths greater than 12 feet, use 5.0 feet)
15-in. to 27-in.	5.0 feet
30-in. to 36-in.	6.0 feet

Notes:
[1] Special manholes shall be designed for mains larger than 36-in. diameter pipe.

The types of manholes allowed by the City are shown in Drawings S101, S102, S103, and S107B of the City of Denton Standard Details. Additionally, connections to manholes must comply with City Standard Specifications.

Generally, manholes shall be stationed on the main run, and where known, the stations of the side mains should also be indicated. When connecting a proposed main to an existing main at a manhole, the connection shall have the top inside elevation of the outfall main level with the top inside elevation of the proposed main. Connections to brick manholes are prohibited.

At the discretion of Water Utilities, Field Operations, or Planning and Engineering D~~epartmentivision~~ staff, manholes with known deficiencies will be required to be replaced.

Manholes deeper than 20 feet must be of monolithic construction, such as ~~FRP~~Glass-fiber Reinforced Polyester.

A. Manhole Locations

Manholes shall be provided at the following locations to facilitate maintenance, cleaning, and inspection:

1. At the location of lateral connections that are 8-in. diameter or larger;
2. At 500 feet intervals on sewer mains 15-in. diameter or smaller; at 800 feet internals on mains 18-in. diameter through 30-in. diameter; at 1,000 feet intervals on mains 36-in. diameter through 48-in. diameter; and at 2,000 feet intervals for 54-in. diameter and larger;
3. At all locations where pipe diameter or pipe material changes;
4. At all locations where the horizontal or vertical alignment of the sewer main changes;
5. At the ends of all mains with service connections. Two main upstream ends may not be combined in one manhole;
6. At the end of any pipe segment at least 150 feet long;

7. At the end of every end-of-line (EOL);
8. Sewer service laterals are to be connected to the sewer main line and not into a manhole unless it is a size-on-size connection;
9. Manholes shall not be placed in sidewalks, pedestrian ramps, driveway approaches, or in the bottom or on the slopes of a drainage channel or drainage structure;
10. At a minimum of 40 feet from any railroad track; and
11. Separation of utilities around manholes shall be a minimum distance of five (5) feet , to allow for maintenance and repair.

6.3.8 Sewer Laterals

B. Water Utilities, Field Operations, or Engineering and Planning staff reserve the right to permit utility-supervised connections to the collection system by non-City staff. Note that the developer will be responsible for all surface rehabilitation associated with connecting to the City's Water Utilities. Surface rehabilitation must match existing site conditions or better.

C. Laterals may not serve more than one (1) lot.

D. Minimum lateral sizes from the sewer main to the public cleanout are:

12. 4-in. minimum for single-family;
13. 6-in. minimum for residential duplex, triplex, and quadplex; and
14. 6-in. minimum for local retail, light commercial, apartment, manufacturing and industrial

E. Single-way clean-outs shall be provided on laterals at the public easement or ROW line. Double-way cleanouts are not allowed. *See* Drawings S403 and S404 of the City of Denton Standard Details.

F. Manholes shall be provided for lateral connections when the lateral pipe diameter is equal to the main sewer pipe diameter or if the lateral is eight (8) inches in diameter or larger.

G. Laterals shall be constructed to the property line and shall be located at a point five (5) feet downstream from the center of the lot on unimproved property. For improved property, design engineers should use technical judgement in lateral placement.

~~B.~~H. Preferred grade for lateral construction within the ROW/PUE is 2%. Laterals within ROW/PUE shall not be designed with less than 1% grade.

~~6.3.10~~6.3.9 Underground Utility Crossings

Wastewater mains and manholes shall be separated from water mains as set forth in 30 TAC §217.53(d) - Separation Distances and 30 TAC §290.44 - Water Distribution.

The requirements of Section 6.2.10 of this Manual shall govern the crossing of underground utility lines by wastewater mains.

6.3.10 Fence or Wall Crossings

The requirements of Section 6.2.11 of this Manual shall govern the crossing of fences or walls by wastewater mains.

6.3.11 Highway Crossings

Crossings of State or County-controlled roads shall require the review and approval of the appropriate regulatory agency after consultation with the City's Engineer regarding crossing location. Crossings shall meet the requirements provided by the controlling agency and by the City of Denton Standards. In the event of different requirement levels for the same item, the more stringent standard shall apply. Crossing locations must be easily and directly accessible on each side of the highway. Additional access easements and installation of all-weather road surface may be required. The City of Denton shall have final say in the location, criteria and standards of highway crossings considering access, maintenance and repairs.~~Crossings of State or County-controlled roads shall require the review and approval of the appropriate regulatory agency. Crossings shall meet the requirements made by the controlling agency and by City of Denton Standards. In the event of different requirement levels for the same item, the more stringent standard shall apply.~~

6.3.12 Railroad Crossings

The design engineer shall, prior to the design of any railroad crossing, contact the appropriate railroad company and regulatory agency to determine if there are any special requirements. Crossings shall be discussed with must be approved in writing by the City's Engineer. In the event the City of Denton Design Criteria are more stringent than those of the Railroad Company or regulatory agency, the City's standards shall apply. Crossing locations must be easily and directly accessible on each side of the railroad. Additional access easements and installation of all-weather road surface may be required. The City of Denton shall have final say in the location, criteria and standards of railroad crossings considering access, maintenance and repairs.~~The design engineer shall, prior to the design of any railroad crossing, contact the appropriate railroad company and regulatory agency and determine if there are any special requirements. In the event City of Denton Design Criteria are more stringent than those of the Railroad Company or regulatory agency, the City's standards shall apply.~~

6.3.13 Creek Crossings

When a sewer main crosses a creek or channel, the design engineer must evaluate the condition of the creek bed and ensure erosion control is provided. Backfill material and minimum construction criteria are shown in the City of Denton Standard Details S701 and S702. These criteria include creek bed soil and condition, as well as presence of exposed rock. When working in these areas, minimize storage of soil, materials, and equipment near floodways and waterways. Crossing locations must be easily and directly accessible on each side of the creek. Additional access easements and installation of all-weather road surface may be required. The City of Denton shall have final say in the location, criteria and standards of creek crossings considering access, maintenance and repairs.

A. Siphons

For creek or channel crossings where a Low-Water Channel Crossing is not feasible, design of an inverted siphon crossing is permissible when approved by the City's Engineer through a design deviation request. Inverted siphons shall not have less than two (2) barrels, with a minimum pipe size of eight (8) inches, and shall be provided with necessary appurtenances for convenient flushing and maintenance. Access structures are required at each end of the siphon, with adequate clearance for maintenance and cleaning purposes. Bank and channel stabilization may be required to protect the crossing lines and casing of the carrier pipe may be required to meet environmental or other restrictions. Siphon locations must be easily accessible on each side of the creek by heavy equipment for maintenance. Additional access easements and installation of all-weather road

surface may be required. The City of Denton shall have final say in the location, criteria and standards of creek crossings considering access, maintenance and repairs.

6.3.14 Tunneling, Borings, Jacking, and Casing

~~Tunneling, boring, jacking and casing are methods used for sewer line placement under restrictive conditions when open cut construction is not allowed. Only straight pipe alignments for both horizontal and vertical alignments are allowed.~~

~~Design engineers should consider the location, size and depth of boring and receiving pits when choosing the beginning and ending stations for boring. A typical bore pit is between 35 and 40 feet in length to accommodate the boring machine and one joint of pipe. Width of the bore pit can vary depending on the depth and size of pipe, with the narrowest width being approximately 15 feet. The preferred location for the bore pit is the lower elevation end of the bore; allowing any groundwater and/or boring slurry to drain from the tunnel into the bore pit. The water can then be removed by pumping.~~

~~Steel casing pipe, where required for open-cut or other than open-cut installation, shall conform to City Standard Specification 33 05 07 Steel Casing Pipe, and have an ID large enough to accommodate a carrier pipe of at least two (2) standard sizes above the pipe being installed.~~

Force main~~s through casings~~ tunnels and bores shall follow the same requirements as are laid out for water mains in Section 6.2.16**Error! Reference source not found.** of this Manual.

~~6.3.14~~6.3.15 Abandonment of Sewer Mains

A. The design engineer should note the limits and appropriate conditions for the abandoning of existing wastewater mains which are to be replaced by the construction of any proposed wastewater mains.

B. The design engineer should also make allowances in the design to provide for the existing and proposed mains to be in service simultaneously until all customer services are transferred from the old main to the new main with minimum interruption of service. If the construction of a proposed main necessitates the abandoning of the existing main prior to the new main's placement into service, then provisions for a temporary wastewater main with services must be addressed by the design.

C. Typically, abandoned lines may be left in place with only the ends being plugged with grout or concrete. However, the City may require special abandonment actions including, but not limited to, filling the abandoned wastewater main with grout, removal and proper disposal of all above ground appurtenances, and removal and proper disposal of the abandoned pipe. In situations where a manhole is being left in service even though one (1) or more lines into the manhole are being abandoned, the abandoned line shall be cut and plugged outside of the manhole. However, if the City determines that the pavement is in good condition the City may allow the abandoned line to be plugged from inside of the manhole.

~~6.3.15~~6.3.16 Abandonment of Manholes

If a manhole as well as the sewer main is to be abandoned, the method described in ***Abandonment of Sewer Mains***, above, along with the minimum guidelines shown in Drawing S105 of the City Standard

Details, shall be used.

~~6.3.16~~6.3.17 Lift Stations

The need to construct a lift station should be determined only after a thorough analysis of the physical and economic factors involved. A Preliminary Engineering Report is required, which lists all factors and adheres to current state regulations. The City reserves the right to review each proposal and determine whether there is enough merit to justify a lift station. Any lift station located in the City of Denton CCN must adhere to these requirements.

A. Preliminary Design Submittal

A preliminary design submittal is required for each lift station proposed. The submittal shall include a written report and a map prepared by a Professional Engineer, licensed by the State of Texas.

1. The plans submitted shall contain the following information, at a minimum:
    a. Be to scale, with the scale indicated;
    b. A north arrow;
    c. A location map;
    d. Delineation of the boundary of the proposed development;
    e. Delineation of the boundary of the sewershed in which the development lies;
    f. The area in acres of the development;
    g. The area in acres of the sewershed contributing to the lift station;
    h. The proposed land use or uses for the development;
    i. The proposed land use or uses for the sewer basin;
    j. The proposed lift station site, along with the GPS coordinates;
    k. The proposed force main routing and size;
    l. Delineation of the 100-year flood plain and ESAs;
    m. Location and size of the existing collection system at the tie-in point;
    n. Contour lines (2-ft. intervals);
    o. Show how storm drainage is taken off site; and
    p. Property lines.
2. The written report shall include the following information:
    a. A general narrative about the proposed development and the circumstances that warrant a lift station, including a phasing plan detailing the utilization and station limitations from initial flow to buildout;~~;~~
    b. Influent hydraulic calculations showing:
        i. Area in acres of the sewer basin and the development;
        ii. The area of each proposed land use for the development and for the projected land use(s) for the basin;
        iii. The design flow for the basin and the development;
        iv. The peak flow for the basin and the development;
        v. Elevation of the proposed lift station site; and

vi. The elevation of the proposed discharge point of the force main.

c. Preliminary wet well volume calculations;

d. Preliminary force main size;

e. Cost estimates for proposed lift station(s) and force main(s), and cost estimates for a gravity line in lieu of the lift station if possible;

f. Ground water levels included in a comprehensive geotechnical report for the ~~in~~ proposed site areas; and

g. A copy of the summary transmittal letter to TCEQ showing agency approval of proposed plans.

B. Site Layout

1. Station Siting:

The following are the minimum criteria for station sites:

a. The station shall be protected from the 100-year flood and shall be accessible during a 100-year flood;

b. The station should be located as remotely as possible from populated areas. The entire station site shall be completely enclosed with an 8-ft. high, opaque concrete or masonry wall, with an opaque sliding gate with a minimum width of 16 feet on track flush with the ground. All shall be of an architectural style and colors blending with the development architecture, as approved by the city;

c. The lift station site shall be large enough to allow the construction of the lift station to serve the upstream basin(s), and its replacement while maintaining active service without a bypass;~~.~~

~~b.~~d. The station site must have verified radio communication ability with the City's central Supervisory Control and Data Acquisition (SCADA) antenna location;

~~c.~~e. The station shall have a minimum 16-ft. wide drive approach and be accessible by City of Denton service trucks, without requiring vehicles to turn after entering the drive approach to the station;

~~d.~~f. The station will include an approved odor-control system;

~~e.~~g. The station site and its access shall be dedicated as a separate lot to the City, as City property;

~~f.~~h. The station site cannot be located within the boundaries of any private entity intended to regulate property including, but not limited to, HOAs, COAs, and POAs;

~~g.~~i. The station site shall be located so it may serve as much as the entire sewer basin as possible. This may require the station to be located off-site of the development. When it is required that the station serve a larger area than the proposed development, the developer may enter into a pro-rata contract with the City to be reimbursed the cost of excess capacity as other developments tie to the system; and

~~h.~~j. The on-site generator must have an unobstructed 36-in. buffer on all sides and be accessible by City service vehicles.

2. Wet Well/ Dry Well Arrangement

a. Orientation shall consider the routing of incoming sewers and force main;

b. Orientation shall allow at least a 2-ton vehicle to directly access the wet well or the dry well, forwards and backwards or larger vehicle as appropriate;

c. Wet wells and dry wells shall be separate structures~~d by at least a water and gas tight wall with separate entrances separated from each other by earth~~;

d. Wet wells shall have sloped bottoms to avoid excess sludge deposits;

e. The wet well shall have a lockable aluminum door with an aluminum frame and safety grating. The minimum opening size shall be 4-ft. x 6-ft. with two (2) doors large enough to adequately maintain the wet well. Door and frame shall be Bilco Type K, KD or an approved equal;

f. The dry well or valve vault shall have a lockable aluminum door with an aluminum frame and safety grating. The minimum opening size shall be 2-ft. x 3-ft. or large enough to adequately maintain the dry well or meter vault. Door and frame shall be Bilco Type K, KD or an approved equal;

g. The wet wells, dry wells, manholes, valve vaults and meter vaults, including decks, shall all be cast-in-place concrete only. No other materials are acceptable. *See* City Standard Specification 33 05 64 Concrete Wet wells, Valve Vaults, and Appurtenances for Lift Stations;

h. The coating for the wet well exterior and interior walls shall be coated as specified in Specification 33 05 64 Concrete Wet wells, Valve Vaults, and Appurtenances for Lift Stations;~~Table 6.3-E and 6.3-F below, respectively~~;

i. The wet well shall be hydrostatically tested to the top of the wet well for 48 hours prior to placing the lift station into service. Only losses due to evaporation will be acceptable; and

j. Provisions shall be made to remove water from the dry well, valve vault or ~~meter vault~~ without allowing gas or water from the wet well into these structures.

~~3. Exterior Walls (below grade, to be backfilled)~~

~~**Table 6.3-E: Exterior Wall Coating**~~

~~Surface Preparation~~	~~Coating System~~
~~Clean and Dry~~	~~Tnemec Series 46H-413 Polyamide Epoxy – Coal Tar 8 – 10 mils in two coats for a total of 13.0 to 20.0 dry mils~~

~~4. Interior Walls (Thick Film System)~~

~~**Table 6.3-F: Interior Wall Coating**~~

~~Surface Preparation~~	~~Coating System~~	
	~~PRIMER~~	~~FINISH~~
~~Brush-off Blast Cleaning~~	~~Tnemec Series 218 Mortarclad ¼-in.~~	~~Tnemec Series 436 Perma-Shield 100 – 125 dry mils~~

~~**Notes:**~~
~~[1] In addition to this coating system, the lining products listed in Drawing S101 of the City of Denton Standard Details~~

~~Table 6.3-F: Interior Wall Coating~~

~~and Standard Specification 33 01 40 Liners for Sanitary Sewer Structures are acceptable.~~

~~5.~~3. Site Access

a. Access will be provided by concrete entrance and pad for aesthetics and ease of maintenance. ~~an all-weather surface of flex-base or better from a public street to the station site~~;

b. Access shall be functional during a 100-year flood. The road surface shall be above the water level caused by a 100-year return period storm;

c. Every station more than 100 feet from a public street requires a turn-around adjacent to the lift station, sized large enough to accommodate a City service truck with generator;

d. The equipment rack shall not obstruct vehicle access to the wet well or the dry well; the location must be approved during the review process. It shall be placed at an easily accessible elevation and include a canopy; and

e. Site inside the fence shall be an all-weather surface, such as ¾-in. crushed rock or flex-base.

~~6.~~4. Passive Ventilation

a. Passive ventilation shall be screened to prevent insect access to the wet well or any vaults where ventilation is required. Minimum diameter of air vents shall be four (4) inches. Vent outlet shall be at least one (1) foot above the 100-year flood elevation. The passive ventilation system must be sized to vent at a rate equal to the maximum pumping rate of a lift station, but not to exceed 600 fpm through a vent pipe.

C. Hydraulic Design

For influent flow, the preliminary design report shall include the design flow and the peak flow for the development and the sewer basin. The design flow shall be calculated in accordance with TCEQ rules. Refer to Section 6.3.1 - Estimated Wastewater Flows herein for peak flow calculations.

1. Pump Capacity

a. Firm pumping capacity is the pumping capacity of the station with the largest pump out of service.

b. The firm pumping capacity shall be greater than the peak flow for the entire sewer basin. If the sewer basin is significantly larger than the proposed development and it is not feasible to design for this flow, the firm pumping capacity may be designed to handle a portion of the basin with approval from the City's Engineer.

c. The pump curves shall be selected so the pumps will run near the best efficiency point during normal operating conditions. The selected curves shall also be such that the pumps do not approach shut-off head when they are running simultaneously.

d. System head curves, pump curves and head calculations shall be submitted. Calculations and pump curves at both minimum (all pumps off) and maximum (last normal operating pump on) static heads, for a C value of both 100 and 140, must be

provided for each pump and for the combination of pumps with modified pump curves.

2. Wet Well Volume

   a. Wet well volume for a submersible pump station is the volume contained above the top of the motor, or as specified by the pump manufacturer, to the bottom of the influent pipe. TCEQ Rule §217.60(b)(4) (d) A gravity pipe discharging to a wet well must be located so that the invert elevation is above the liquid level of a pump's "ON" setting.

   b. Wet well volume for all other non-submersible pump stations is the volume contained in an area from a minimum of two (2) feet above or distance at which vortexing does not occur above the top of the intake of the pump.

   c. High level alarm elevation shall be a minimum of 48 inches below the top of the wet well or 48 inches below the flow line elevation of the lowest influent pipe, whichever elevation is lower. Wet well volume shall be calculated by the following method:

$$T = V/(D - Q) + V/Q \qquad \textbf{[Eqn. 6.4]}$$

   Where: T = Total time between successive pump starts in minutes (operating cycle)
   D = Rated pump capacity (in GPM)
   V = Storage volume between lead pump on and pump off elevations (in gallons)
   Q = Inflow to wet well (in GPM)

   Note: The operation cycle 'T' shall not be less than 10 minutes for Average Flow and not more than 60 minutes for Minimum Flow conditions.

   d. Per TCEQ Rules, 30 TAC § 217.63:

      i. Systems for preventing the discharge of wastewater must operate for a duration at least equal to the longest power outage on record for the past 60 months, or at least 20 minutes, whichever is longer. The design must be based on peak flows, inflow, and infiltration. If the longest power outage on record for the past 60 consecutive months is greater than 48 hours and generators will be used to provide backup power, then the owner must have a contract in place that guarantees fuel supply during an emergency. The owner must also have sufficient storage capacity at the wastewater treatment facility for the fuel required for the duration of the emergency.

      ii. For calculation purposes, the owner must assume that the lift station wet well is full to the pump activation level when the power outage period begins.

3. Force Main Capacity

   a. Force main capacity shall be sized to meet the capacity of the entire sewer basin. The force main may be designed to handle a portion of the basin with approval from the City's Engineer.

   b. The minimum force main size shall be four (4) inches in diameter, except for Grinder Pump lift stations.

   c. The minimum recommended velocity is three (3) fps, and the velocity shall not be less than two (2) fps when only the smallest pump is in operation.

   d. The maximum velocity through a force main shall not be more than six (6) fps and will require confirmation per 30 TAC §217.67 that the pipeline will not fail.

D. Pumps

Pump specifications are listed in the City of Denton Specification 33 25 02 Sewage Pumps. Substitutions or deviations from the list of acceptable pumps requires the approval of the City's Engineer. The number of pumps must comply with 30 TAC § 217.61(e). If pumps are to have a variable capacity, Variable Frequency Drives (VFDs) are to be specified. Stations requiring three pumps must be equipped with VFDs on at least two of the pumps.

E. Mechanical

1. Force Mains
    a. Force mains shall be laid to City of Denton Standard Specifications.
    b. Plans shall include plan and profile for the force main, including valves every 2,000 feet per 30 TAC § 217.67.
        i. Valves must be resilient wedge gate valves and conform to the Section 33 14 20 Resilient Seated (Wedge) Gate Valves of the City of Denton Standard Specifications;
        ii. Valves must be in a manhole and conform to Section 6.3.10 of this criteria manual and Section 33 05 61 Cast-In-Place Concrete Manholes of the City Standard Specifications; and
        iii. The force main shall have an isolation valve immediately downstream of the flow meter vault.
2. Lift Station Interior Piping
    a. Piping inside the lift station shall be ductile iron meeting AWWA C-150 and C-151. All fittings shall be ductile iron meeting AWWA C-110 or C-150. Interior of the pipe and fittings shall be lined with American Polybond Plus, which consists of a primer layer of 5 mils thick fusion bonded epoxy and 55 mils thick of modified DuPont Fusabond Polyethylene, or approved equal.
    b. All nut and bolt assemblies potentially exposed to sewer gases ~~inside the wet well~~ shall be ASTM 316 stainless steel.
3. Isolation Valves
    a. Each pump shall have one (1) isolation valve downstream of the pump, in a separate vault.
    b. Isolation valves shall be resilient seat gate valves or plug valves meeting the City of Denton Standard Construction Specifications.
4. Check Valves
    a. Check valves shall be controlled closing swing check valves with a lever arm or a ball check. There must be at least 15 feet of vertical head downstream in order to use a ball check valve.
    b. A check valve shall be located upstream of the isolation valve in a separate vault.
    c. All nuts and bolts shall be stainless steel.
5. Air Release / Vacuum Valves
    a. Air release valves of a type suitable for wastewater service shall be installed along the force main where the force main would be prone to trapped air.

b. The type of valve shall be ~~air release or~~ a combination of air release and vacuum breaker (see Drawing S803 on Sheet 6 of the City Standard Details). The design engineer shall determine the type and location, subject to approval of the City's Engineer.

c. Calculations for valve type and valve sizing shall be provided to the City.

d. Locations of the air release/vacuum valves shall be shown on the plan and profile sheets for the force main.

~~e. Isolation valves for air release valves that are three (3) inches or smaller shall be all bronze or brass. Isolation valves four (4) inches or larger shall meet City of Denton Standard Construction Specification for resilient seat gate valve. The first fitting placed into the force main shall be a brass corporate valve (male corporate fitting).~~

~~f. Air release valves shall be fitted with blow off valves, quick disconnect coupling and hose to permit back flushing after installation without dismantling the valve.~~

e. Air release valves along the force main outside of the lift station site must be located in a vault as shown in Standard Details.

~~g.~~f. Air release valves within the lift station valve vault shall have air vents plumbed to the vault drain.

6. Generators

a. On-site generators shall be installed to serve as the source of back-up power for lift stations. They must be sized for 125% of the largest pump motor, plus 100% of the additional pump motors and other loads.

b. Generators shall be mounted on a concrete foundation designed to handle the weight of the generator.

c. Generators shall ~~be~~ use diesel for fuel unless explicit written permission is granted to use ~~an~~ a different fuel.

d. Electrical receptacles for a mobile load bank shall be provided in the electrical design.

e. Generators rated for ~~3~~500KW~~w~~ or more shall be provided with a permanent load bank situated to adequate dissipate the heat generated on the lift station site.

f. Generators shall be furnished with sound attenuation appropriate for the location.

7. Hoists

Station designs that exceed or are likely to exceed the lifting capabilities of the existing City Water Reclamation service trucks are to provide permanent onsite hoists rated for the lifting of the heaviest assembly in the wet well, considering rag accumulation.

F. Electrical, Instrumentation, and Supervisory Control and Data Acquisition (SCADA) Requirements

1. In accordance with the Lift Station Instrumentation and Control Panel Build Agreement, the contractor building the lift station is required to utilize a pre-approved vendor from the City's current list to perform the specified Instrumentation and Controls (I&C) and SCADA work. The selection of the vendor for a specific project will be made during the pre-construction phase and will be based on vendor availability and project requirements~~The City of Denton Water Reclamation Department performs the build and install of SCADA and telemetry~~

~~packages. Developers should request the packet and the City of Denton will provide a bill of materials for this service.~~

2. Provide a radio pathway study showing line of sight from the lift station to the receiver at Pecan Creek Water Reclamation Plant.

3. Sites equipped with Variable Frequency Drives (VFDs) shall provide a climate-controlled building for housing all electrical and electronic equipment.

~~7.~~4. Adequate lighting of the lift station wet well, valve vault, pump control equipment, electrical and instrumentation equipment shall be included with the station design. All lighting provided should be LED lighting.

~~6.3.17~~6.3.18 Low-Pressure or Alternative Collection Systems

Low pressure collection systems may be allowed with specific approval by the City's Engineer.

6.3.19 Wastewater Treatment Plants, And Peak Flow Detention Facilities

If wastewater treatment plants or peak flow detention facilities are needed to support a development, the design shall be directed by the Water Utility considering the needs of the development and the Wastewater Utility System.

~~6.3.18~~6.3.20 On-Site Sewage Facilities

A. General

Planning, design and operation of on-site sewage facilities within the City of Denton must comply with the current 30 TAC Ch. 285 for On-Site Sewage Facilities, as amended. The property owner proposing to use an on-site sewage facility shall comply with the criteria listed in this Section, and Section 7.6.16 of the City of Denton DDC, as amended.

B. Permits Required

Any owner of a residential, commercial, or institutional building who utilizes an on-site sewage facility is required to secure a permit from the City of Denton to construct, alter, repair, or extend an on-site sewage facility regardless of the size of the lot or tract of land. Contact the Environmental Services Department~~ivision~~ at the Pecan Creek Water Reclamation Plant for details on permit fees and maintenance requirements.

C. Site Evaluations

A Professional Engineer or a professional sanitarian, licensed by the State of Texas, must perform site evaluations.

D. Planning Requirements

A Professional Engineer or a professional sanitarian, licensed by the State of Texas, must prepare on-site sewage facility plans.

E. On-Site Sewage Facility Land Use Requirements

Lots or tracts of land where an on-site sewage facility is proposed must have the following minimum area size.

1. A minimum of one (1) acre when a public water system serves the tract or lot; and

2. A minimum of two (2) acres when a private water well is located on the tract or lot.

~~6.3.19~~6.3.21 Pretreatment Device: Grease ~~Traps~~Interceptors / Grit Traps / Oil Separators

A. General

Planning, design, and operation of ~~grease traps~~ pretreatment devices within the City of Denton must comply with the most current City of Denton Plumbing Code, Chapter 28; Article VII; Section 2~~8~~6-56, as amended. The property owner proposing to use and operate a grease trap shall comply with the criteria listed in this Section and abide by required responsibilities outlined in City of Denton Code of Ordinances Chapter 26; Article XII – Liquid Waste.

Definitions can be found in the City of Denton Code of Ordinance, Chapter 26, Article XII, Section 26-306 and Chapter 26, Article V, Section 26-154.

B. ~~Device Required~~Applicability

Any user of the publicly owned treatment works (POTW), as defined by Section 26-15~~4~~3, and meeting the definition of "~~food service facilities" or "facilities which perform washing, cleaning, or servicing of automobiles, trucks, buses or similar equipment~~generator," as defined by Section 26-306, shall be required to install a ~~grease trap~~ interceptor ~~or grit trap~~pretreatment device in accordance with locally adopted plumbing codes as amended. Food service establishments shall not share grease interceptors unless specifically authorized by the City's Engineer.

These requirements are applicable to all commercial food service establishments, including those that are undergoing:

1. New construction
2. Interior remodeling to accommodate expansion or operational modifications
3. Changes of ownership/occupancy
4. Facilities which fail to meet limitations outlined in article V, Chapter 26 of the Code of the City of Denton, Texas
5. When discharges which may cause blockages in the wastewater collection system

~~Unless otherwise approved in writing by the City, all fixtures, equipment, and drain lines located in the food preparation, alcohol service, clean-up, and food service areas of a food service establishment shall be connected to a grease interceptor. Fixtures required to connect to a grease Interceptor shall include but are not limited to pot sinks, pre-rinse sinks, hand sinks, prep sinks, dishwashers, soup kettles, braising pans, wok ranges, mop sinks, floor sinks, floor drains, and wastewater generated from exhaust fan hood cleaning operations.~~

~~C. Sample Port Required~~Grease Interceptor Requirements

~~Any pretreatment device must have a sample port allowing for the instantaneous grab sampling of the effluent of the device. The sample port must be solely representative of the process wastewater and sanitary tie-ins must be done down-stream of the sampling port. The proposed sampling port must allow for a wide-mouthed 250-mL amber glass bottle to be submerged / partially submerged into the effluent.~~

~~Unless otherwise approved in writing by the City, all fixtures, equipment, and drain lines located in the food preparation, alcohol service, clean-up, and food service areas of a food service establishment shall be connected to a grease interceptor. Fixtures required to connect to a grease~~

~~Interceptor shall include but are not limited to pot sinks, pre-rinse sinks, hand sinks, prep sinks, dishwashers, soup kettles, braising pans, wok ranges, mop sinks, floor sinks, floor drains, and wastewater generated from exhaust fan hood cleaning operations.~~

~~D.~~C. Review Required

Plumbing plans for new facilities must be prepared by a plumber or a Professional Engineer, licensed by the State of Texas, and submitted as a part of the development process. These plans must show the fixtures draining into the pretreatment device. Plans must also include the flow-through rating of the pretreatment device as well as the grease or solids retention capacity~~. Plans must also show~~ and, the location of the down-stream sampling port. Plumbing plans for existing facilities must be submitted when applying for a certificate of occupancy. These plans must show the fixtures draining into the pretreatment device and indicate the flow through rating and grease and solids capacity of the pretreatment device.

D. Construction/Installation

All permitting, construction, and inspection activities must be completed in accordance with the City of Denton Plumbing Code Chapter 28. Additionally, the following specifications must be incorporated into grease trap design.

1. The grease interceptor shall be constructed with a minimum of two baffles. Each manhole access shall be minimum 20-in." diameter clear opening.
2. Grease traps are to be installed at a minimum distance of 10 ft~~t~~eet~~.~~ from sinks and dishwashers to allow for adequate cooling of the wastewater. Water temperatures must be less than 120 degrees prior to entering grease trap.
3. Pretreatment devices shall be constructed of a material that is compatible with the type of waste generated by the Facility and treated by the device.

~~3.~~ All grease bearing waste streams should be routed through an appropriate grease trap/interceptor, including: three-compartment sinks, pot/pan sinks, soup kettles, hand-washing sinks, automatic dishwashers, mop sinks and floor drains.

4.

5. Any pretreatment device must have a sample port allowing for the instantaneous grab sampling of the effluent of the device. The sample port must be solely representative of the process wastewater and sanitary tie-ins must be done down-stream of the sampling port. The proposed sampling port must allow for a wide-mouthed 250-mL amber glass bottle to be submerged or partially submerged into the effluent. Interior, above-ground hydromechanical grease interceptors with a liquid capacity of 100 gallons or less may install a sample spigot with a ball valve in leu of a sample port due to space constraints with city approval. The sample spigot must be solely representative of the process wastewater and sanitary tie-ins must be done down-stream of the sample spigot. Sample wells will have a minimum 12"-in. diameter access cover. Mechanical Traps and Interceptors that are installed above ground must be equipped with an influent flow regulator and an effluent valve assembly that allows for sample collection.

Unless otherwise approved in writing by the City's Engineer, all fixtures, equipment, and drain lines located in the food preparation, alcohol service, clean-up, and food service areas of a food service establishment shall be connected to a grease interceptor. Fixtures required to connect to a grease Interceptor shall include but are not limited to pot sinks, pre-rinse sinks, hand sinks, prep sinks,

dishwashers, soup kettles, braising pans, wok ranges, mop sinks, floor sinks, floor drains, and wastewater generated from exhaust fan hood cleaning operations.

E. Grease Interceptor Sizing Requirements

Sizing methods described herein are intended as guidance in determining grease trap/interceptor sizes that will afford the City's sanitary sewer system a minimum degree of protection against grease and other obstructing materials. Sizing determinations are based on operational data provided by business owners or their contractors. In approving a customer's plumbing or grease interceptor design, the City does not accept liability for the failure of a system to adequately treat wastewater to achieve effluent quality requirements specified under City of Denton Code of Ordinance Chapter 26. It is the responsibility of the generator and/or contractors to insure the appropriate level of treatment necessary for compliance with environmental and wastewater regulations.

1. ~~Definitions~~Gravity Grease Interceptors (GGI) shall meet the requirements of ASME A112.14.6 and IAPMO/ANSI Z1001. The required capacity of gravity grease interceptors shall be determined by multiplying the peak drain flow into the interceptor in GPM by a retention time of 30 minutes as required by the International Plumbing Code.

   ~~a. Heavy Food Preparation: Any area in which foods are prepared utilizing a grill, griddle, deep-fat fryer, commercial type ovens, and/or any similar food preparation equipment; or any area subject to flooding type of wet cleaning procedures due to the cutting or processing of meat, poultry, fish or pork; or any facility subject to rinsing preparation equipment that is exposed to dairy products. Heavy food preparation includes, but is not limited to, cafeterias, coffee shops, fast food restaurants, full service restaurants; pizza preparation, donut preparation, and meat and fish markets, etc.~~

   ~~b. Light Food Preparation: Any area in which foods are prepared exclusive of the use of fryers, grills or similar equipment. Light food preparation is usually limited to the preparation of hot dogs, sandwiches, salads or other similar foods and fountain-type cold drinks. Light food preparation includes, but is not limited to, sandwich shops, limited-menu concession stands, etc.~~

   ~~c. No Food Preparation: Any area in which foods are provided pre-wrapped, from an approved source, with microwave oven type heating being the maximum handling involved. No food preparation is limited to pre-packaged sandwiches or similar foods, candies and containerized beverages.~~

2. ~~Grease Trap Design Criteria~~Hydromechanical Grease Interceptors (HGI) shall be designed and tested in accordance with ASME A112.14.3 and/or CSA B481.1. Sizing shall be in accordance with HGI Sizing and Selection, as shown in the following two-step process:

   a. Step 1: Size by Flow Rate

      The minimum flow rate for HGIs may be calculated by either using pipe diameter or fixture volume using either a one-minute or two-minute drainage period. Use a one-minute drainage period when the interceptor will be installed inside of the building and has indirectly connected fixtures. When the interceptor will be installed outside of the building, use a two-minute drainage period.

      i. Fixture Volume Sizing

         Use the following formula for sizing fixtures by volume with a 75% fill factor:

         Fixture Capacity Gallons = [(L x W x H) / 231] x 0.75 [Eqn. 6.5]

         Note that,

Fixture Capacity Gallons x 1 = one-minute drainage period (GPM)
Fixture Capacity Gallons x 0.5 = two-minute drainage period (GPM)

Example calculations are shown below for a three-compartment sink with each compartment dimensions being 18 x 24 x 12 inches:

18 x 24 x 12 = 5184 ~~cubic inches (in3)~~cu. in.
5184 / 231 = 22.44 fixture capacity gallons
22.44 x 3 = 67.3 total fixture capacity gallons (three bowls)
67.3 x 0.75 = 50.4 total fixture capacity after loading factor (75%)
50.4 x 1 = 50 GPM one-minute drainage period
50.4 x 0.5 = 25 GPM two-minute drainage period

To determine the minimum required flow rate for the HGI, calculate the capacity of each fixture that will be connected and add the volumes together and use the appropriate drainage period. An appropriate HGI must be certified to meet the minimum flow rate as calculated.

b. Step 2: Calculate Grease Capacity

Once the minimum flow rate has been established as detailed in Step 1, the minimum grease storage capacity for the HGI required for the desired pump-out frequency is calculated as follows:

Grease Capacity Needed = Meals per day x GPV x DPC [Eqn. 6.6]

Where: GPV = Grease Production Values (See ~~FSE Values in~~ Table 6.3E below)
DPC = Days per Pumpout Cycle [Recommended 90 days]

Table 6.3-E: ~~Typical~~ Grease Productions Values for Typical FSEs

Menu	w/o Fryer, No Flatware	w/o Fryer, Flatware	w/ Fryer, No Flatware	w/ Fryer, Flatware
Bakery	0.035	0.0455	0.035	0.0455
Bar - Drinks Only	0.005	0.0065	0.025	0.0325
Bar and Grille	0.035	0.0455	0.035	0.0455
BBQ	0.035	0.0455	0.035	0.0455
Buffet	0.035	0.0455	0.035	0.0455
Burger Joint	0.025	0.0325	0.035	0.0455
Cafeteria - Full Serve	0.035	0.0455	0.035	0.0455
Cafeteria - Heat & Serve	0.025	0.0325	0.035	0.0455
Chinese	0.035	0.0455	0.035	0.0455
Coffee Shop	0.005	0.0065	0.025	0.0325
Continental breakfast	0.005	0.0065	0.025	0.0325
Convenience Store	0.005	0.0065	0.025	0.0325
Deli	0.005	0.0065	0.025	0.0325
Donut Shop	0.005	0.0065	0.035	0.0455
Don't know yet	0.035	0.0455	0.035	0.0455
Family Restaurant	0.035	0.0455	0.035	0.0455
Fast Food - Limited Prep	0.025	0.0325	0.025	0.0325
Fast Food - Full Prep	0.035	0.0455	0.035	0.0455
Fried Chicken	0.035	0.0455	0.035	0.0455

Table 6.3-E: ~~Typical~~ Grease Productions Values for ~~T~~typical FSEs				
Greek	0.035	0.0455	0.035	0.0455
Grocery Store	0.035	0.0455	0.035	0.0455
Ice Cream/Yogurt/Smoothies	0.005	0.0065	0.025	0.0325
Indian	0.035	0.0455	0.035	0.0455
Italian	0.035	0.0455	0.035	0.0455
Mexican	0.035	0.0455	0.035	0.0455
Pizza Restaurant	0.025	0.0325	0.035	0.0455
Pizza Carryout	0.005	0.0065	0.025	0.0325
Multi-unit dwelling	0.005	0.0065	0.025	0.0325
Salads / Healthy Bowls	0.025	0.0325	0.025	0.0325
Sandwich Shop	0.005	0.0065	0.025	0.0325
Seafood	0.035	0.0455	0.035	0.0455
Snack Bar	0.005	0.0065	0.025	0.0325
Steak House	0.035	0.0455	0.035	0.0455
Sushi	0.005	0.0065	0.025	0.0325

Notes:
[1] To determine the correct grease factor, select the menu type, then the correct column for whether there is a fryer and whether the establishment uses disposable or washable plates, glasses, knives, forks, and spoons (flatware).
[2] FSEs that are not open every day, may calculate the number of days open in a 90-day period and use that to calculate the total amount of grease capacity required and must submit calculation for review.

Source: Brown Grease Supply Study, 2011, Kennedy/Jenks Consultants.

Example calculations are shown below for a Fast Food – Full Prep, with fryer, with disposable flatware, serving 300 meals per day:

Grease factor from Table 6.3E = 0.035 pounds per meal
Meals per day = 300
Days between pump-outs = 90
Grease Capacity Needed = 0.035 x 300 x 90 = 945 pounds

The correctly sized and selected grease interceptor will have the minimum flow rate determined in Step 1 and the grease storage capacity calculated in Step 2. Grease interceptors certified to meet the minimum requirements of ASME A112.14.3 or CSA B481.1 shall have the flow rates and minimum grease storage capacities as listed in Table 6.3-F below:

Table 6.3-F: Minimum Grease Storage Capacity for Grease Interceptors	
HGI Flow Rate (GPM?)	Minimum Grease Storage Capacity[1] (lbs.)
20	40
25	50
35	70
50	100

Table 6.3-F: Minimum Grease Storage Capacity for Grease Interceptors	
75	150
100	200

Notes:
[1] Minimum grease capacity as required by ASME A112.14.3, PDI G101 and CSA B481.

Grease interceptors claiming grease capacities exceeding the minimum requirements in Table 6.3-F, shall be reviewed and approved by the City when the manufacturer can demonstrate by third-party test reports, including the incremental test data, that the interceptor(s) has the capacity claimed. Upon approval from the City, the grease interceptors proven grease storage capacity may be used in selecting the sizes and required number of units to satisfy the requirements of the two-step sizing method in Section 6.3.21.E.2 of this Manual.

F. Laundries

Commercial Laundries, laundromats, and dry cleaners shall be equipped with an interceptor to reduce the quantity of lint and silt that enter the collection system. The system must be of adequate size and design to allow for cool-down of wastewater so that separation can be more readily achieved. The interceptor must be installed with a wire basket or similar device, removable for cleaning, that prevents passage into the drainage system of solids ½-inch (12.7 mm) or larger in size, string, rags, buttons or other materials detrimental to the public sewerage system.

G. Car Washes

Where automobiles are washed (including detail shops utilizing hand-wash practices), separators shall have a minimum capacity of 1000 gallons for the first bay, with an additional 500 gallons of capacity for every other bay.

H. Automotive Repair Facilities (Garages and Service Stations)

Where automobiles are serviced, greased, or repaired or where gasoline is dispensed, oil or water separators shall have a minimum capacity of 500 gallons for the first 1000 sq. ft. of area to be drained, plus 250 gallons for each additional 1000 sq. ft. of area to be drained into the separator.

~~**Table 6.3-G: Grease Trap Design Criteria[1]**~~

~~Classification~~	~~Seating Capacity[2] > 50~~	~~Seating Capacity[2] < 50~~
~~Heavy Food Preparation~~	~~750-gal. gravity grease interceptor~~	~~250-gal. grease interceptor~~
~~Light Food Preparation~~	~~250-gal. gravity grease interceptor~~	~~20 GPM flow-through rating or 40-lb. retention capacity~~
~~No Food Preparation~~	~~No interceptor required~~	

~~**Notes:**~~
~~[1] Or the minimum size established by the currently adopted International Plumbing Code; whichever is more stringent.~~
~~[2] Seating Capacity is measured using locally adopted Maximum Floor Area Allowances per Occupant, found in the currently adopted version of the International Building Code.~~

~~6.3.20~~6.3.22 Inspections Required

New installations or existing pretreatment devices must be inspected by the City of Denton Pretreatment

Program prior to the issuance of a Certificate of Occupancy for new businesses.

6.4 Construction Plans

6.4.1 General

Before any public works construction relative to a development may begin, City staff will verify the construction plans have been approved. Construction may not begin until the construction plans have been approved, all materials used for public improvements have been submitted and approved, all fees (including review and inspection fees) have been paid, all necessary agreements and bonds have been provided, and a Pre-Construction Conference has been held by the City.

6.4.2 Responsibility

The sealing engineer is responsible for the accuracy, completeness, and conformance of the submitted plans to City standards. The purpose of the City review is to ensure conformance to City policies and standards. The City review is limited to facts as presented on the plans submitted. The City has no project engineering design or quality control review responsibility. The engineer of record certifying the plans is responsible for the accuracy and completeness of the plan documents. The City reserves the right to require plan corrections to fit actual field conditions or meet City standards requirements, which are found to be contrary to or omitted from the plans.

6.4.3 Format

Construction plans shall be digitally drawn on 24-in. x 36-in. size sheets with borders of 22-in. x 34-in., so half-size reproduced plans will be to half-scale fitting 11-in. x 17-in. sheets. Each sheet shall be legible when reduced to half-size. Digital copies of the plans shall also be provided.

6.4.4 Plan Requirements

Construction Plans must contain, as a minimum, information listed in the following sections before they can be approved:

A. General

North arrow, scale, date, and mean sea level elevations of all improvements, based on North America Vertical Datum 1988 (NAVD 88). Only NAVD 88 shall be used for plan elevations; no assumed or NGVD 29 elevations. Plans shall be drawn with a horizontal scale of one (1) inch equals 40 feet as a minimum, and appropriate corresponding vertical scale. The plans shall provide a reference to the elevation benchmark or monument used in the development of the plans. Show all crossings of existing and proposed underground utilities. Plans shall account for future changes in topography. The construction plans shall be signed and sealed by a Professional Engineer, licensed by the State of Texas, prior to bidding the project for construction.

B. Water Systems

Plan sheets must show the horizontal alignment of the proposed water system within street ROWs and easements, with horizontal control points for location of the ROWs and easements and for location of the water system within the ROWs and easements. Sizing of pipe, valves, fittings and appurtenances must be shown on the plan view. All valves, fittings, fire hydrants, and other appurtenances must be stationed and given GPS coordinates (with an accuracy of ± six (6) inches)

based on the City of Denton's grid coordinate system. Profile views of water mains ~~12 inches or larger must~~ shall be provided showing proposed grade, pipe material, casing pipe size and thickness (if any), and the location, elevation and size of any underground conduit or facility to be crossed. Deflections (if any) must be shown on the plan and profile views, as applicable, with stationing and the degree of deflection. Approved design deviations (if any) from City Standard Details must be provided. Show all service lines up to and including the meter can/vault. Service lines do not need to be stationed or have GPS coordinates. Adequate detail of other planned and existing improvements shall be shown to indicate planned crossings of utilities, storm drains, and stormwater facilities and potential conflict points.

C. Sanitary Sewer Systems

Plan sheets must show the horizontal alignment of the proposed sanitary sewer system within street ROWs and easements, with horizontal control points for location of the ROWs and easements and for location of the sanitary sewer system within the ROWs and easements. Sizing of pipe, manholes, fittings and appurtenances must be shown on the plan view. Manhole rim elevations, and pipe "IN" and "OUT" elevations must be shown. All manholes, fittings, and other appurtenances must be stationed and given GPS coordinates (with an accuracy of ± six (6) inches). based on the City of Denton's grid coordinate system. Every sanitary sewer line shall be profiled. Profile views shall show proposed grade, pipe material, casing pipe size and thickness (if any), manhole information, and the location, elevation and size of any underground conduit or facility to be crossed. Approved design deviations (if any) from City Standard Details must be provided. The plan view shall include arrows indicating direction of flow in pipe. Show all service lines to and including the public cleanout. Service lines do not need to be stationed or have GPS coordinates. Adequate detail of other planned and existing improvements shall be shown to indicate planned crossings of utilities, storm drains, and stormwater facilities and potential conflict points.

D. Grading

For situations involving proposed grading over existing water or sanitary sewer systems, provide a grading plan and profile showing the existing and proposed topography in 2-ft. contours. The grading plan shall consist of contours and spot elevations with water directional arrows to define the flow patterns.

Section 7: Streetlight Design Criteria

7.1 Overview

The purpose of Section 7 – Streetlight Design Criteria is to assist developers and engineers in creating an aesthetic, consistent, and safe lighting plan for our streets, sidewalks, and neighborhoods. This section outlines the process for design, review, and approval of new lighting projects, as well as criteria for modernizing existing lighting infrastructure. Streetlights are usually owned by Denton Municipal Electric (DME) which is a part of the City of Denton (the City), however they may be installed, operated, and maintained by DME, other electric utilities, or private owners depending on the location. This section of the DCM has been created to help navigate the process for selecting, permitting, placing, and maintaining streetlighting throughout the city. This manual does not apply to security, area, pathway, private, or other lighting not associated with a public road.

This manual cannot cover all the situations that might be encountered, required, or requested in the construction and installation of streetlighting. Any apparent discrepancy, omission, error, or requirement necessitating further explanation or interpretation should be referred to DME Engineering (940-349-7117 or 940-349-4173) for further clarification.

The goal of the criteria laid out in this Section 7 is to implement the following guiding principles into the application of street designs in the City of Denton:

A. Enhance safety of the community for pedestrians and drivers alike
B. Conserve energy by prioritizing efficient lighting design
C. Minimize impact to the environment including light pollution
D. Minimize impact to neighborhoods and residences by reducing light trespass
E. Provide for a uniform and aesthetic look throughout the city
F. Be fiscally responsible through effective application of design principles

7.1.1 Applicability

The existing streetlight installations throughout the City of Denton have been accepted as is at the time of approval of this manual. Retro-active replacements and upgrades solely for the purpose of bringing existing lighting up to the standards of this manual are not required. This manual is intended to apply to all new projects in the City beginning July 1, 2024. (This means the project has been approved/permitted by Development Services on or after July 1, 2024).

7.1.2 Organization

Section 7 – Streetlight Design Criteria is organized as follows:

A. Overview
B. Requirements
C. Developer & DME Responsibilities

7.2 Requirements

7.2.1 General

The City adheres to the guidance of ANSI RP-8 Recommended Practice for Design and Maintenance of Roadway and Parking Facility Lighting for all highways and streets *except for local residential streets with speed limits of 30 mph or less*. ANSI RP-8 acknowledges that vehicle headlights may provide adequate illumination for slower speeds when the driver has sufficient time for reaction and stopping. As per ANSI RP-8, Section 11.6.3.1 – 'When Residential Street Lighting May Not be Needed', for local residential streets (e.g., within a residential development) with speed limits of 30 mph or less, street lighting shall be placed no more than 250 feet apart. A photometric (lighting) study will be required for all new installations except for local residential streets with speed limits of 30 mph or less.

These standards shall apply to all new streetlight installations, upgrades, replacements, and conversions from the date of the adoption of these standards onward.

Easement, ROW~~right-of-way~~, and permitting regulations that are not listed in this manual still apply to streetlights. The developer is responsible for knowing and adhering to any laws and regulations governing development and construction relating to the work being done.

Developers are responsible for the design, materials, and installation costs of all streetlighting on public streets within and adjacent to their project. *See* the Developer and DME Responsibilities Section of this manual for more specific descriptions of responsibilities. DME will only energize new streetlights after the installation has been approved by DME. For most lighting installations, following energization, DME will accept ownership and maintenance of streetlights unless the lighting is located on a private drive (i.e. the City has not taken ownership of the street / streetlights) or the lighting is non-standard and will not be owned or maintained by DME.

Streetlights are not normally metered. The City (or customer in certain cases) is charged a monthly usage and maintenance fee per light according to the Denton Municipal Utility Rates Manual. This does not apply to private drives and other private properties where the developer or customer chooses to install lighting other than the standard city approved options. In such cases, DME will provide a metered service point only and the customer will be responsible for all installation, maintenance, and fees associated with the lighting installation in accordance with applicable city codes, ordinances, and utility service standards for the life of the installation.

City streets and street projects will not be considered complete until adequate streetlighting has been installed, approved, and energized. For example, for the streets in a new development to be accepted by and turned over to the City, street lighting must be complete.

7.2.2 Roadway Lighting Requirements

A. Roadway Designations

To determine the proper lighting for a roadway, it is important to determine what type of vehicle and pedestrian traffic the roadway is meant to accommodate. Roadways may be classed into several different categories based on these two variables. The lighting requirements are then applied to provide adequate lighting to mitigate the risks of collision by a vehicle with another object, vehicle, or pedestrian.

Roadways may be classified as *highways and freeways, arterials, collectors,* and *local roads*. In this section of the DCM, local roads may also refer to auxiliary roadways such as *alleys, drives, dead-ends,* and *cul-de-sacs*. Local roads may be residential streets (providing direct access to homes) or other local roads providing access to businesses and connecting larger roads together. Local roads

generally have speed limits of 30 mph or less, while highways, arterials, and collectors will have higher speed limits. *Local roads* are further broken down into *residential* and *non-residential streets* in portions of this section to allow flexibility in managing light levels in residential neighborhoods. Specific road classification and design information may be found in Section 5 – Transportation Design Criteria of this DCM.

B. Lighting Evaluations and Design

For streetlighting of highways and streets, *except local residential streets with speed limits of 30 mph or less,* lighting shall be designed per ANSI RP-8. A photometric (lighting) study will be required for these new installations. ANSI RP-8 requires that a pedestrian activity classification be made to determine the required lighting levels. *See* ANSI RP-8 for further guidance on pedestrian activity classification and streetlighting design requirements. Additional information may also be found in the TxDOT Highway Illumination Manual, and AASHTO GL-7, "Roadway Lighting Design Guide". All designs adhering to ANSI RP-8 standards shall be verified and documented using appropriate lighting design software. A licensed Professional Engineer in the state of Texas shall stamp all lighting designs before each submittal.

For all local *residential* streets with speed limits of 30 mph or less, street lighting shall be installed at intersections, cul-de-sacs, and no more than 250 feet apart for the remainder of the street. Lighting may be installed along one side of the street, both sides in parallel, both sides alternating, or in the median. Separation distances should be measured along the centerline of the street. Additional lighting may need to be considered if there are obstacles or road geometries that cutoff some of the light. *See* the Sample Local Residential Streetlighting Layout shown below in Figure 7.1.

When designing or adding streetlights to existing roadways and/or neighborhoods, consideration should be given to the style and placement of any existing fixtures. New streetlighting shall be chosen from the available styles that most closely matches the style of the existing lighting in the area. Historic poles are only approved for specific applications and areas designated as historic districts or within the Downtown Implementation Plan area.

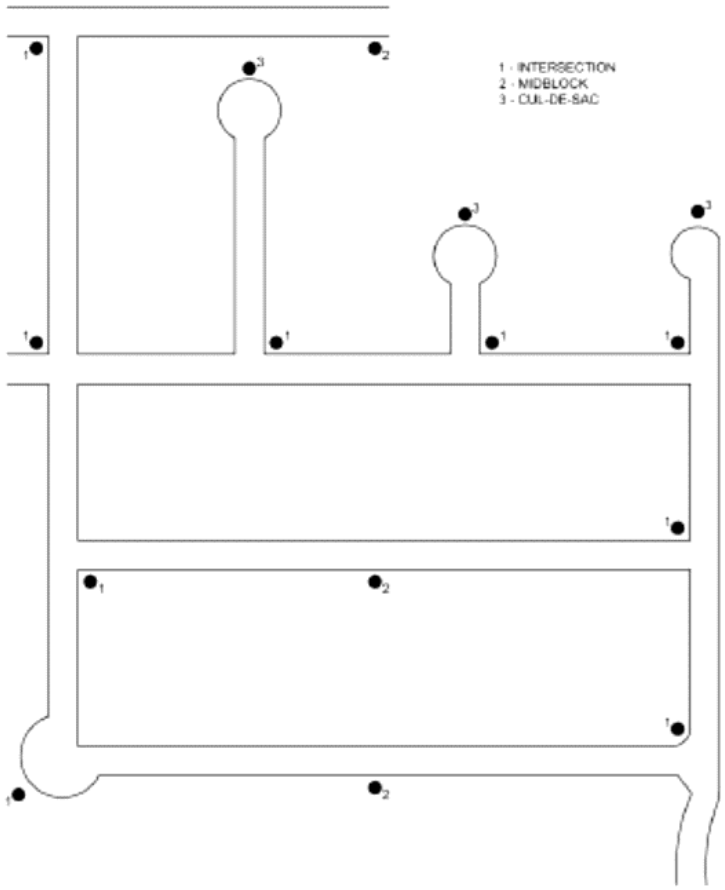

Figure 7.1 Sample Local Residential Street Lighting Layout

(Lights are shown at intersections, cul-de-sacs, and mid-block when spacing between lights exceeds 250 feet)

C. Intersection and Crosswalks

Intersections have a much higher number of potential conflict points as vehicles and pedestrians are permitted to cross through normal lanes of traffic. Therefore, additional care is needed when planning intersection lighting. ANSI RP-8 should be used to design lighting at intersections for larger, busier streets as stated previously. *See* Figure 7.2 shown below.

Because of the additional safety concerns for vehicles, cyclists, and pedestrians at crosswalks and intersections, the following examples (taken from ANSI RP-8) are provided to assist streetlight design for local streets. While not strictly required, they should be considered as good lighting practice for these types of locations.

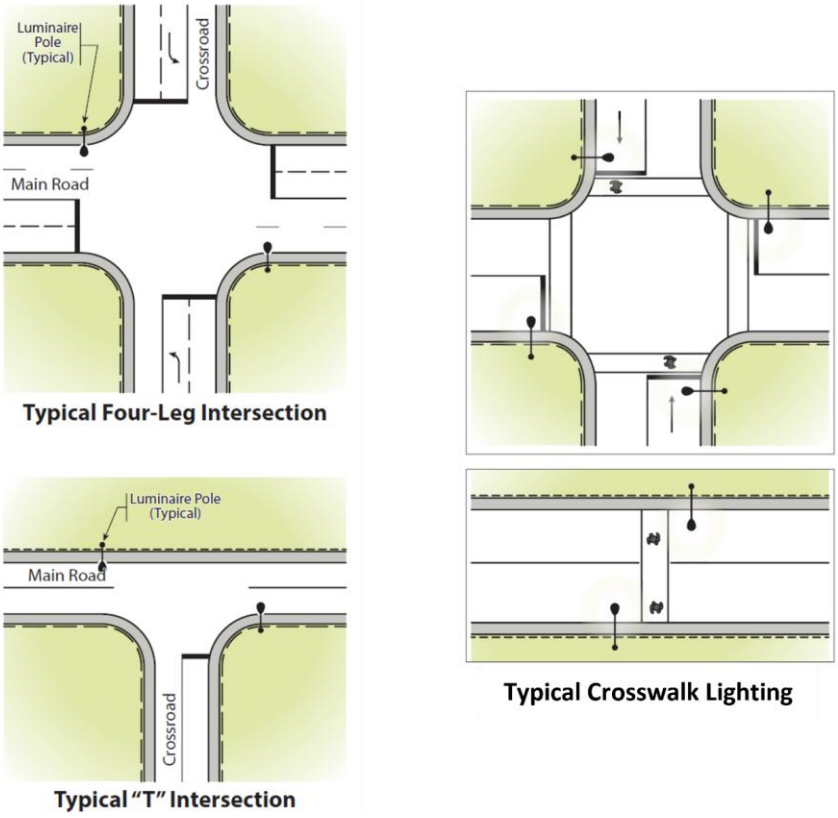

Figure 7.2 Typical Lighting Schematic for Intersections

D. Roundabouts and Traffic Circles

Like intersections, roundabouts and traffic circles have a higher number of potential conflict points than normal streets. ANSI RP-8 should be used to design lighting at traffic circles and roundabouts of larger streets. For local streets, an example of round-about lighting design considerations is shown below. Some locations may not require as much lighting as shown depending on the size of the traffic circle. *See* Figure 7.3 shown below.

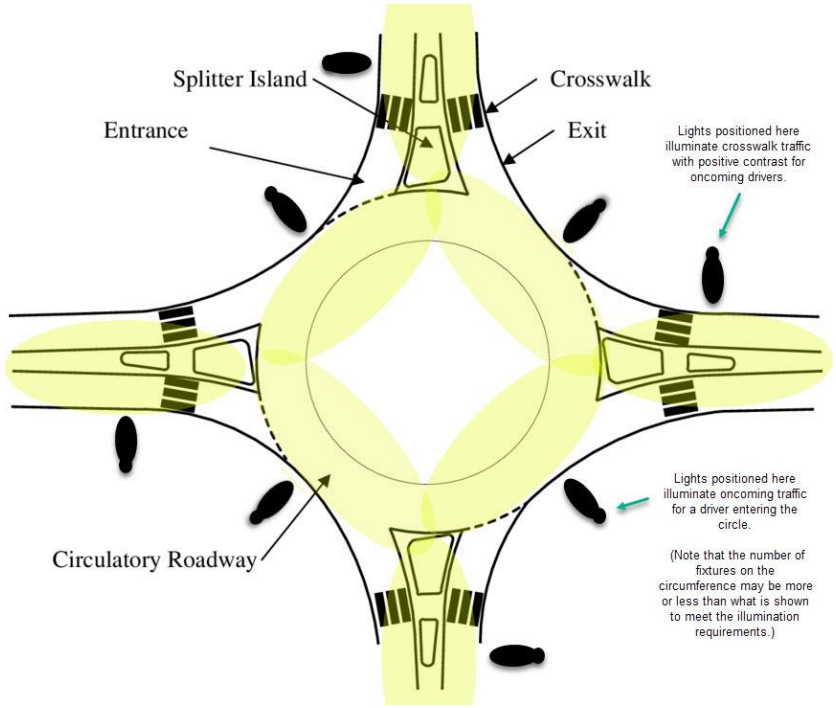

Figure 7.3 Roundabout Lighting Placement Schematic

E. Railroad Crossings

Railroad crossings are slightly different than normal intersections and require lighting adjustments accordingly. It is of course, vitally important that drivers are able to see a train that is crossing, and conversely, that the train engineer has a clear picture of any obstructions while approaching an intersection. Street lighting at railroad crossings should therefore illuminate the intersection while not causing glare for the drivers or train engineer. The following figure illustrates the recommended lighting placement for a railroad crossing. *See* Figure 7.4 shown below.

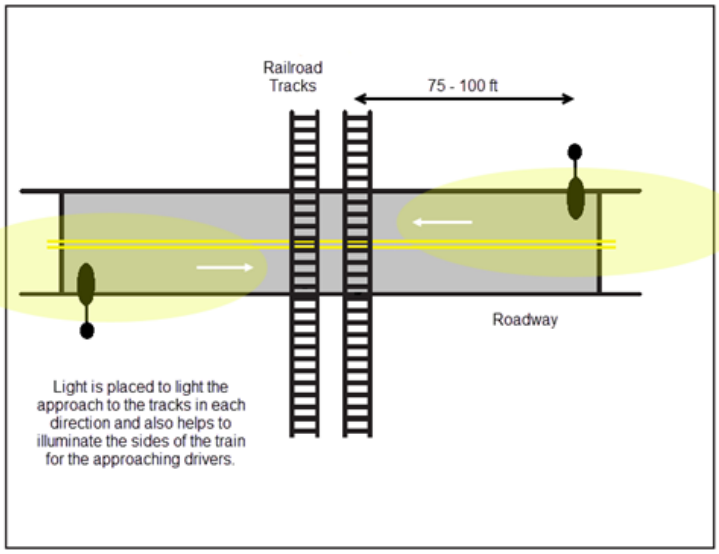

Figure 7.4 Railroad Crossing Schematic

7.2.3 Installation Requirements

A. Placement

1. Highways and Streets (except for local residential streets with speed limits of 30 mph or less)

   Installation should follow TxDOT recommendations in the TxDOT Highway Illumination Manual. Where TxDOT requirements do not apply, the streetlight system shall be installed in the ROW~~right-of-way~~ or within public utility easements and poles should be placed approximately 2.5 feet back from curbs and 10 feet back from edge of paving for uncurbed roads or, where there is sidewalk abutting the curb, approximately 1 foot behind the sidewalk. Deviations of more than 1 foot in either direction from these requirements must be approved by DME Engineering.

2. Local Residential Streets (speed limits of 30 mph or less)

   The streetlight system shall be installed in the ROW~~right-of-way~~ or within public utility easements. Poles should be placed approximately 2 feet back from the curb of 10 feet from un-curbed pavement. If a sidewalk abuts the curb, then the pole should be placed approximately 1 foot behind the sidewalk. In a residential neighborhood, streetlights should be placed within 5 feet of common property lines (e.g. between neighbors).

B. Vertical and Horizontal Clearance

New streetlights should not interfere with existing structures or rights-of-way, including sidewalks, nor should the placement preclude the ability to perform maintenance on the pole in a safe manner. *See* National Electric Safety Code (NESC) section 234 for specific clearances required for overhead

electric installations. The exception to this requirement is when streetlight arms are mounted directly to wooden distribution poles.

Proposed trees should be located at least 25 feet from any streetlight location. When installing new lights in a location with existing trees, consideration should be given to the age and maturity of the tree and whether it will interfere with the light when it is fully grown. DME will be responsible for tree trimming around streetlights to preserve the integrity of streetlighting as needed.

Median-mounted poles should be installed at least 20 feet back from an intersection to minimize the number of vehicle-streetlight collisions due to vehicles and trucks turning too sharply at the intersection.

In areas predominantly served by overhead electric powerlines, streetlights are usually installed by attaching streetlight arms to existing wood distribution poles. Care should be given when planning for lighting in these areas as overhead lines pose a conflict when placing new lighting poles. Clearances must be maintained for safety. Redesign/relocation of existing overhead power lines just to accommodate lighting is costly and time consuming. Utilizing existing wood pole locations and installations on the opposite side of the street are two ideas for additional placement options in these areas.

C. Approved Fixtures and Materials

The approved streetlight components for each class of roadway are listed below in Tables 7.2-A and 7.2-B.

Table 7.2-A: Approved Luminaires and Hardware by Location

~~ROADWAY CLASSIFICATION~~	ROADWAY CLASSIFICATION					
	HIGHWAYS AND FREEWAYS (UNLESS OTHERWISE SPECIFIED BY TXDOT)	**ARTERIALS AND LARGE COLLECTORS**	**ALTERNATE ARTERIALS AND COLLECTORS**	**COLLECTORS AND LOCAL STREETS**	**EXISTING RESIDENTIAL LOCAL STREETS (ALSO USED IN HISTORIC DISTRICTS)**	**NEW RESIDENTIAL LOCAL STREETS (≤ 30 MPH)**
Make	Signify Lumec RFL	Signify Lumec RFM	Gardco Optiform M	Signify Lumec RFM	Hadco	Gardco
Model	RFL-241W112LED-4K-G2-R2M-UNV-DMG-ML-RCD7-API-GY3	RFM-160W48LED-4K-G2-R2M-UNV-DMG-ML-RCD7-API-GY3	OPF-M-A10-840-2TM-MAR-UNV-TR7-DGY	RFM-85W24LED-3K-G2-R2M-UNV-DMG-ML-RCD7-API-GY3	C-1891P RL34AANN2A SNR7WA3 NNNNSP1	OPF-S-P05-730-T2M-AR1-UNV-SP2-TR7
Wattage	241W LED	160W LED	112W LED	85W LED	69W LED	66W LED
Lumens	30,188	19,489	20,357	8,753	7,734	11,253
Color Temperature	4000k	4000K	4000K	3000K	3000K	3000K
Light Distribution Type	Type II	Type II	Type II	Type II	N/A	Light II
Voltage	120 – 277V or 347 – 480V	120 – 277V or 347 – 480V	120-277V	120 – 277V or 347 – 480V	120 - 277V	120 – 277V
B-U-G Rating	B4-U0-G4	B3-U0-G3	B3-U0-G3	B3-U0-G3	B2-U5-G4	B2-U0-G2
Pole Type	Steel, white concrete, or wood	Steel, white concrete, or wood	Dark Gray Steel	Steel, white concrete, or wood	Residential - Concrete aggregate Historic – Cast Aluminum	Steel, square, gray
Globe Type	N/A	N/A	N/A	N/A	Hadco, RL34 Acrylic Victorian	N/A
Arm Type	8-ft. metal (specs depend on pole type)	8-ft. metal (specs depend on pole type)	8-foot metal	8-ft. metal (specs depend on pole type)	N/A	Std-mount, no arm

Table 7.2-B: Approved Pole Types by Location

Part Information	Part Description	Highway and Freeway [1]	Arterial and Large Collector	Collector and Local Street	Existing Res. Local Street	Historic District [2]	New Res. Local Street [3]
POLE TYPE – WOOD DISTRIBUTION							
N/A	Wood pole. Various heights, but standard id 35 feet. DME warehouse item. Direct buried. Overhead electric service.	Yes	Yes	Yes	Yes	No	No
Arm - Shakespeare #OPAR-8-H	8-ft. curved aluminum arm. ~~DME warehouse item.~~	-	-	-	-	-	-
POLE TYPE – WHITE CONCRETE							
Lonestar #351101	35-ft. Concrete pole, white color. Single or double arm available. DME warehouse item. Direct buried. Underground electric service.	Yes	Yes	Yes	Yes	No	No
Arm - Curlee #2009032TG-Flat Base	8-ft. flat aluminum arm. ~~DME warehouse item.~~	-	-	-	-	-	-
POLE TYPE – CONCRETE AGGREGATE							
Lonestar #20004-SJB (Waterford Series)	20-ft. Concrete aggregate pole. Post-top luminaire configuration. Direct buried. Underground electric service. Legacy – replacement and maintenance only	No	No	No	Yes	No	No
POLE TYPE – ANTIQUE ALUMINUM							
Acuity #PX-CP18-12-F4-AB3/133T3-ANBK	12-ft. antique, decorative aluminum pole. Post-top luminaire configuration. Requires concrete foundation. Underground service.	No	No	Yes[2]	Yes[2]	Yes[2]	No
POLE TYPE – EMBEDDED STEEL							
(Single Arm) KW Industries RTSU35-9.0-11-RAL7043-18S-GS-E	35-foot round steel pole, gray color (RAL7043). Single arm, direct buried pole. Underground electric service. Arm included with pole. Pairs with Gardco Optiform M luminaire.	Yes	Yes	Yes	No	No	No
(Double Arm) KW Industries RTSU35-9.0-11-RAL7043-28S-GS-E	For use in medians. 35-foot round steel pole, gray color (RAL7043). Double arm, direct buried pole. Underground electric service. Arm included with pole. Pairs with Gardco Optiform M luminaire.	Yes	Yes	No	No	No	No

Part Information	Part Description	Highway and Freeway [1]	Arterial and Large Collector	Collector and Local Street	Existing Res. Local Street	Historic District [2]	New Res. Local Street [3]
POLE TYPE – BREAK-AWAY STEEL[4]							
(Single Arm) KW Industries RTSU35-9.0-11-RAL7043-18S-GS-BSC-1.00-SKT Foundation 30" x 96" Concrete	35-foot round steel pole, gray color (RAL7043). Single arm, breakaway base mounted on a poured concrete foundation. Underground electric service. Arm included with pole. Pairs with Gardco Optiform M luminaire. Contact DME for poured concrete foundation standards.	Yes[4]	Yes[4]	No	No	No	No
Double Arm (Single Arm) KW Industries RTSU35-9.0-11-RAL7043-28S-GS-BSC-1.00-SKT Foundation 30" x 96" Concrete	For use in medians. 35-foot round steel pole, gray color (RAL7043). Double arm, breakaway base mounted on a poured concrete foundation. Underground electric service. Arm included with pole. Pairs with Gardco Optiform M luminaire. Contact DME for poured concrete foundation standards.	Yes[4]	Yes[4]	No	No	No	No
POLE TYPE – BRIDGE-MOUNT STEEL STEEL[5]							
(Single Arm) KW Industries RTSU35-9.0-11-RAL7043-28S-GS-ATB1-17 Foundation TXDOT Bridge	For use in medians. 35-foot round steel pole, gray color (RAL7043). Double arm, breakaway base mounted on a concrete bridge foundation. Underground electric service. Arm included with pole. Pairs with Gardco Optiform M luminaire.	Yes	Yes	No	No	No	No
~~**POLE TYPE – STEEL**~~							
~~(Single Arm) KW Industries RTSU35-8-11-Gray-18S-N~~	~~35-ft. round steel pole, gray color.~~ ~~Single or double arm available.~~ ~~Used for TxDOT designed streetlighting.~~	~~Yes[4]~~	~~Yes[4]~~	~~No~~	~~No~~	~~No~~	~~No~~
~~(Double Arm) KW Industries RTSU35-8-11-Gray-28S-N~~	~~Part numbers may vary slightly depending on application.~~ ~~Not stocked by DME – custom order item.~~ ~~Breakaway bases with concrete foundations may be required for certain installations and bridges.~~ ~~Direct burial available also. Underground electric service~~						
~~Arm(s) – N/A~~	~~Arms are included with pole when ordering.~~	~~–~~	~~–~~	~~–~~	~~–~~	~~–~~	~~–~~
~~Breakaway base – N/A~~	~~Breakaway base included with pole when ordering.~~	~~–~~	~~–~~	~~–~~	~~–~~	~~–~~	~~–~~

~~Part Information~~	~~Part Description~~	~~Highway and Freeway~~ [1]	~~Arterial and Large Collector~~	~~Collector and Local Street~~	~~Existing Res. Local Street~~	~~Historic District~~ [2]	~~New Res. Local Street~~ [3]
POLE TYPE – STEEL RESIDENTIAL							
KW Ind., Part# SSP20-4-11-DGY GARDCO-DM10-BC Foundation 24" x 72" Concrete	20-ft., dark gray (RAL7043), 4-in. square steel pole. Drilled for single-luminaire with ~~std~~ standard mounting pattern. Underground service. Pairs with Gardco Optiform S luminaire. Contact DME for poured concrete foundation standards.~~Includes 3-in. by5-in. handhole and 8-in. bolt circle base pattern. Requires concrete foundation. Underground service.~~	No	No	No	No	No	Yes

Notes:
[1] Unless, otherwise specified by TxDOT.
[2] Historic streetlighting is only available for use in designated historic districts.
[3] Speed limits of 30 mph or less.
[4] Steel streetlight poles are only used for highways and roadways where TxDOT or City-approved plans require placement of break-away bases or non-standard mounting heights.

D. Historic Lighting

Historic lighting is a modern light fixture with a decorative pole and fixture that give the lighting the look of early 20th century lighting. Historic lighting has been approved for use only in the *designated historic* districts of Denton. All requests for historic lighting within these districts must be submitted to DME Engineering for design and approval. Historic lighting is not approved for installations outside of the historic districts. The requesting organization, developer, or agency shall be responsible for all costs related to the design and installation of historic streetlights.

E. Control System

All new streetlighting in the DME service area shall have a control node installed which, at a minimum, will turn the light on and off according to ambient light conditions (photocell control) and shall be compatible with the CityTouch lighting control system. *See* Table 7.2-C shown below. Where street lighting is installed by the developer, DME shall provide and install control nodes at the developer's expense. DME will commission the control nodes into the CityTouch program.

Where streetlighting is served by other electric utilities than DME, DME does not require or install control nodes.

Table 7.2-C: CityTouch-compatible control node models

Model Number	Voltage (V)	Use	Function
LLC7290	120 – 277	Cobra head lights	Photocell controller
LLC7294	347 – 480	High-voltage cobra head lights	Photocell controller
LLC7291	120 - 277	Post-top lights	Astro-clock (GPS location-based timers)

F. Dimming and Light Trespass

The City adheres to ANSI RP-8 lighting levels for all streets *except* local residential streets with speed limits of 30 mph or less. Lighting that has been designed to ANSI RP-8 cannot be dimmed without diminishing the lighting level which, by definition, no longer meets the RP-8 standard. Thus, all streetlighting that is not in residential neighborhoods with speed limits of 30 mph or less will be maintained at full brightness.

On local residential streets with speed limits of 30 mph or less, the streetlights may be dimmed by resident request at specific locations due to light pollution concerns by residents. DME will dim residential streetlights down as low as 60%.

The City also reserves the right to install house side shields (available only on cobrahead lights) and make other reasonable modifications to the luminaires to minimize impacts to the residents at the DME's discretion.

G. Migratory Birds and Other Flying Species

DME will dim residential streetlights down as low as 50% during select animal migration or activity periods as specified by the City Environmental Services & Sustainability Department.

H. International Dark Sky Association

DME installs and maintains two types of streetlight luminaires (light fixtures), post-top and cobrahead. The cobrahead light fixtures are endorsed by the International Dark Sky Associate (IDA) which makes recommendations on lighting with minimal up-light. The existing post-top lighting fixtures are not IDA endorsed, however an acceptable IDA approved alternate is being considered for all residential streets with speeds less than 30 mph.

7.2.4 Construction Requirements

Streetlight construction (e.g. conduit, wiring, etc.) shall follow the DME Standard Construction Drawings, stated below:

A. DSL-ARM
B. DSL-STD
C. DSL-12A
D. DSL-20C (Legacy)
E. DSL-35C
F. DSL-20S
G. DSL-35SE
H. DSL-35SE2
I. DSL-35SBK
J. DSL-35SBK2
~~E.~~K. DSL-35SBD

Conduit runs should not exceed 700 feet between pulling locations. When bends total 180 degrees conduit runs should be limited to 500 feet or less. No run of conduit should have more than 360 degrees of total bend between pulling points.

The total length of a single lighting circuit at 120V should be less than 1,000 feet, the total length of a single lighting circuit at 240V should be less than 2,000 feet, and the total length of a circuit at 480V should be less than 4,000 feet unless circuit design and loading has been validated by engineering.

Additional design information may be found in the *TxDOT Highway Illumination Manual*.

7.3 Developer and DME Responsibilities

7.3.1 Highways and Streets (except local residential streets with speed ≤ 30 mph)

Developer is responsible for streetlighting design that meets the requirements of ANSI RP-8 for the appropriate roadway characteristics. A photometric (lighting) study shall be required. The final design must be approved and stamped by a Texas licensed professional engineer. Final design must also be approved by DME Engineering.

Lighting levels, placement, and compliance with ANSI RP-8 must be verified and documented with lighting design software. At a minimum, documentation shall be provided to DME Engineering showing:

A. Street geometry (width, number of lanes, median size)

B. Street classifications (arterial, collector, etc.)

C. Pedestrian activity classification

D. Criteria levels applied (illuminance vs. luminance method, and levels)

E. Lighting placements (median, side, parallel, staggered)

F. Maximum separation distance*

As an alternative to displaying the maximum separation distance as stated in 7.3.1.F above, a layout drawing of the project may be provided with calculation grid values and/or light level isolines indicating that the installation meets the applicable requirements.

For TxDOT projects, the design contractor will provide specific lighting requirements, if any. The design package should dictate where lighting should be placed and what types of poles and fixtures should be used.

For City initiated projects, the City's Engineer or their contractor will design the street lighting and submit to DME Engineering for approval. Once approved, the city's contractor will perform all civil work, and pull wiring and install streetlights and poles. DME will provide service points as needed. DME will also install and commission control nodes for interconnection with CityTouch.

A monthly maintenance, repair, and usage fee will be charged to the City thereafter for all streetlights on public streets per current DME rates.

7.3.2 Local Residential Streets (with speed limits ≤ 30mph)

The Developer (or DME if DME is responsible for the given project) is responsible for the design and layout of streetlights at all intersections, cul-de-sacs, and no more than 250 feet between. DME Engineering shall approve the final design. Once the project is approved and permitted, the Developer is responsible for providing all civil work including grading, trenching, installation of conduit and pull-boxes, etc.

DME is responsible for installation of wire, streetlights and poles, and service points. DME will charge an initial installation cost to the developer based on the number of lights.

A monthly maintenance, repair, and usage fee will be charged to The City thereafter for all streetlights on public streets per current DME rates.

For City initiated projects, the City's Engineer or their contractor will design the street lighting and submit to DME for approval. Once approved, the city's contractor will perform all civil work, and pull wiring and install streetlights and poles. DME will provide service points as needed. DME will also install and commission control nodes for interconnection with CityTouch.

For private streets and drives (where the City of Denton does not take ownership of the roadway or streetlights), one of the following will occur:

A. If non-standard lights are installed, DME will provide a metered service point. Developer is responsible for installation of entire streetlighting system. Designated customer (individual, HOA, etc.) will be responsible for monthly power costs and all maintenance. **OR**

B. If standard DME lighting is installed, Developer is responsible for all civil work (grading, trenching, installation of conduit, etc.) and installation of poles and streetlights. DME will pull wires and connect the lights at the Developer's expense. Designated customer (individual, HOA, etc.) will be responsible the monthly streetlight power and maintenance rates. **OR**

C. Exceptions to this rule must be agreed upon by all parties in a formal agreement.

7.3.3 Streetlighting in Non-DME-Served Areas

Standard streetlights have been approved by the City as listed in the General Requirements section of this manual. Electric utilities other than DME may or may not be able to provide the same luminaires. Non-standard lights will not be maintained by DME or the City. DME will provide, install, maintain, and repair standard the City streetlights at the Developer's expense. The electric service provider will charge the City according to the rates agreed upon between the City and the electric service provider.

For streets in non-DME service territories, Developer should coordinate with the electric utility, DME, and the City at the earliest stage of development to determine and agree upon the following:

A. Developer, City/DME, and Customer responsibilities
B. Service points and project design
C. Mode of disconnect for safe maintenance (e.g. in-line fuses, etc.)
D. Mode of billing (metered usage, monthly rate, etc.)
E. Designated customer/developer responsible for fees
F. Other concerns as applicable

7.3.4 Customer/Citizen Requests for addition/removal of Streetlighting

~~When additional/modified/decreased lighting is requested by a customer, DME will perform an analysis of the lighting to determine if the modifications would provide added safety, visibility, and aesthetic value to a location. Light intrusion, cost, and feasibility will also be considered. At DME's discretion, lighting may be added or modified to bring the streetlighting closer in line with this manual or meet other specific concerns.~~

~~In coordination with the City's Environmental Services & Sustainability Department, DME may dim streetlights in residential areas to no lower than 50% brightness.~~Streetlights managed by DME are funded through the City's Capital Improvement Projects (CIP) process. As concerns are identified and provided to DME via citizen comments, staff input, and/or City Council direction the requests are directed to DME Engineering for technical evaluation. The technical evaluation is to determine if the modifications would provide added safety and visibility according to national and local standards and ordinances. Light pollution/intrusion, cost, feasibility, and aesthetic value are also considered. At the conclusion of the technical evaluation, DME Engineering submits a recommendation for or against inclusion of the project in the CIP.

DME will maintain the list of all requested modifications and prioritize those that have been recommended for inclusion within the upcoming CIP. Some or all of the highest priority projects will be programmed into the upcoming budget based on availability of funds.

Requests for dimming will be considered in residential areas, and in coordination with the City's Environmental Services & Sustainability Department, DME may dim streetlights in residential developments to no lower than 50% brightness. Cobrahead streetlights along other local, collector, and arterial streets may not be dimmed due to safety and regulatory requirements.

Section 8: Environmentally Sensitive Areas Design Criteria

8.1 Overview

The purpose of Section 8 - Environmentally Sensitive Areas (ESAs) Design Criteria is to provide the technical design criteria needed to achieve compliance with DDC Subchapter 7, Section 7.4. The goal is to provide basic guidance for implementing certain components of ESA plans, such as ESA Field Assessments. While the intent of this section is to assist applicants and developers with ESA requirements, full responsibility and liability for proper design and compliance with DDC § 7.4 remains with the developer or applicant. Users of this Manual should be knowledgeable and experienced in environmental surveys, inventorying and restoration (see the basic requirements for a qualified person in this section).

This section does not provide complete guidance for Alternative ESA Plans, as those plans are developed through a variance procedure, due to special circumstances or conditions that apply to the parcel for which the variance is sought. The Alternative ESA Plan procedure is described in DDC § 2.8.4.

The following documents govern the design criteria in this section:

A. The Denton Development Code

B. Floodplain Development Checklist

C. ESA Field Assessment Checklist

D. Alternative Environmentally Sensitive Area Checklist

E. The iSWM Landscape Technical Manual

F. The National Wetland Plant List

8.2 ESA Identification

8.2.1 The Official ESA Map

A. To locate potential ESAs, the applicant shall use the City of Denton's Official ESA Map.

B. The legend in the Official ESA Map displays the types of ESAs and their designations.

1. The City recognizes four types of ESAs

   a. Cross Timbers Upland Habitat

   b. Water Related Habitat

   c. Riparian Buffer ESA

   d. Floodplain ESA

2. ESAs can have one of two designations

   a. Designation Confirmed

      i. ESA assessments expire after 24 months; the applicant shall check the date that the assessment was approved to ensure that the current designation is correct

   b. Not Assessed or Assessment Expired

C. Areas determined to be ESAs during field assessments are added to the Official ESA Map.

D. Areas determined not to be ESAs during field assessments may potentially be removed from the Official ESA Map.

E. Because ESA criteria applies to all land and development, it may be necessary to perform ESA Field Assessments in areas not identified on the Official ESA Map. This could be due to site conditions or current aerial photography (among other reasons).

8.3 ESA Field Assessments

8.3.1 ESA Field Assessor Qualifications

ESA features shall be identified during the ESA Field Assessment by a qualified person. Minimum requirements to be considered a qualified person are:

A. Have a bachelor's degree in ecology or similar field of study; or

B. Be a certified/trained wetland scientist; or

C. Have similar qualifications in plant identification, soil classification, and hydrology.

1. The City accepts professional licenses and certifications such as Professional Wetland Scientist (PWS), Wetland Professional in Training (WPIT), and continuing professional education courses from applicable programs.

8.3.2 ESA Forms

All ESA submittals shall utilize the City's Assessment Forms:

A. Cross Timbers Upland Habitat Assessment Form

B. Floodplain ESA Assessment Form

C. Riparian Buffer ESA Assessment Form

D. Water-Related Habitat Assessment Form

8.3.3 ESA Field

ESA Field Assessments shall contain, at a minimum:

A. Assessor qualifications

B. Comprehensive reports appropriate for each ESA type and feature assessed

C. A project narrative with details of the assessment, including, but not limited to:

1. A brief description of the project's nature

2. Descriptions and locations for ESAs identified on the Official ESA Map

3. Descriptions and locations of any ESAs determined to be present

a. Include detailed reasoning as to why ESA features were identified

b. Include colored photographs as supporting evidence

4. Description and location of any ESAs determined to be absent

a. Include detailed reasoning as to why ESA features were not identified

b. Include colored photographs as supporting evidence

D. Shapefiles identifying both confirmed ESAs, and ESA locations that should be removed. The following geographic information shall be used:

1. Geographic Coordinate System: GCS North American 1983

2. Datum: D North American 1983

3. Prime Meridian: Greenwich

4. Projected Coordinate System: NAD 1983 State Plane Texas North Central FIPS 4202 Feet

5. Projection: Lambert Conformal Conic

E. A site map or series of maps, that delineate the boundaries and types of ESAs as indicated on the Official City of Denton ESA Map

F. A site map that delineates the boundaries and types of ESAs that were assessed; this may differ from the Official ESA Map

1. Indicate the reach of each assessment and locations of photographs taken on a map; this may be its own map

8.4 ESA Preservation Requirements

Where ESAs are identified, whether through field assessments or an existing, confirmed designation, ESA protection must be installed.

A. ESA protection shall consist of protective fencing established at the perimeter of any ESAs. Where a protected tree is located near the ESA perimeter, protective fencing shall be installed at the dripline of the tree.

B. Land-clearing to allow for the installation of ESA protection fencing shall occur upslope of the ESA perimeter (that is, on the outside perimeter), and shall not exceed a width of four feet. It shall not encroach into the dripline or critical root zone of any tree to be protected.

C. Protective fencing should be a minimum of four (4) feet in height and consist of plastic safety fencing or other approved fencing material. Protective fencing shall be supported by posts not exceeding 20 feet spacing.

D. Protective fencing shall be placed downslope of any perimeter controls for erosion and sedimentation.

8.4.1 ESA Inspections

A. Initial Inspections

1. An initial inspection must be conducted prior to commencing land-disturbing activities for the approval of permits or issuance of a Notice-to-Proceed.

2. ESA protective fencing shall be inspected against corresponding site plans for proper placement and installation.

B. Routine Inspections

1. ESA inspections shall be conducted after land-disturbing activities have commenced to

ensure compliance with ESA criteria, and may be conducted during all phases of development, including:

a. cut and fill
b. demolition
c. clearing and grading
d. grubbing
e. stockpiling
f. installation of utility infrastructure
g. construction
h. vertical building

2. Routine inspection items shall include:
   a. Maintenance, repair and replacement of ESA protective fencing; damaged ESA fencing shall be repaired or removed and replaced during all phases of development until final inspection.
3. During development, access to the ESA shall be prohibited; the ESA shall be preserved in its original state.
4. The disposal of any waste material into the ESA is prohibited.
5. Siltation/sedimentation to the ESA is prohibited; any that occurs shall be addressed in a timely manner.
   a. Siltation/sedimentation impacting up to 0.10 acres of any ESA must be removed by hand or equivalent method, as approved by the City.
   b. Siltation/sedimentation impacting 0.10 acres or more of any ESA must be addressed through an Alternative ESA Plan.
6. The permanent loss of any native vegetation is prohibited.
   a. Native vegetation loss impacting up to 0.10 acres of any ESA or the loss of up to two (2) trees, shall be replaced in-kind.
   b. Native vegetation loss impacting 0.10 acres or more of any ESA, or the loss of three (3) trees or more, must be addressed through an Alternative ESA Plan.

8.5 Restoration Plans for Permitted Uses and Activities

8.5.1 Restoration Plan Requirements

Permitted uses and activities for each ESA are described in DDC §§ 7.4.6-7.4.8. For permitted uses and activities, the applicant shall provide a restoration plan which, at a minimum, includes:

A. Locations and descriptions of any areas within the ESA that will require restoration.
B. Locations and descriptions of temporary stabilization measures.
C. Descriptions of restoration activities, including but not limited to:
   1. Erosion minimization

2. Native plant restoration
3. Invasive vegetation removal

D. Schedule/timeline for restoration activities

E. Descriptions and locations of permanent seed mixes and/or plantings.

8.5.2 Restoration Activities

A. This subsection applies to approved Restoration Plans and, and mitigation for Alternative ESA Plans.

B. Restoration and/or mitigation shall be initiated immediately whenever development activities have permanently or temporarily ceased within the ESA.

1. Development activities have permanently ceased when land-disturbing activities within the ESA have been completed.
2. In the context of this provision, "immediately" means as soon as practicable, but no later than the end of the next workday, following the day when development activities have temporarily or permanently ceased.

C. Restoration and/or mitigation shall be completed prior to close-out or issuance of final Certificate of Occupancy.

8.5.3 Alternative ESAs

For Alternative ESA plans, mitigation must be initiated as ESAs are disturbed and to the same extent, unless alternatively specified in the approved Plan

Section 9: Design Deviations

9.1 Overview

9.1.1 General

All developments within the City and its extraterrestrial jurisdictions shall conform to the design criteria established in this DCM. In the event that a development cannot comply with the design criteria established, a design deviation process is used to evaluate, document, and approve proposed alternative methods.

Any deviation from the required design criteria for design of facilities outlined in this DCM must be submitted as a design deviation request to the City's Engineer and Department Reviewer, prior to incorporating it into the final design of a project.

9.2 Design Deviation Procedure

9.2.1 Request for Design Deviation Submittal and Processing

A. All design deviation requests must be submitted as a formal request to Development Project Facilitation using the 'Request for Design Deviation Form' included in Appendix B, along with supporting documentation.

1. The 'Request for Design Deviation Form' shall be filled out completely with exception of the portions noted as "For Use by City".
2. Supporting documentation shall include:
    a. All pertinent information on the facilities involved or to be involved. The specific portion of this DCM, policies, or design standard(s) for which a design deviation is sought;
    b. Description(s) of all other design alternatives which the applicant has evaluated in attempts to comply with the design criteria prior to the request for design deviation; and
    c. A statement that provides justification for the requested design deviation and how it is the necessary and optimal solution when compared with reasonable alternatives for the scenario presented.
3. Design deviation requests that do not contain the required Request for Design Deviation Form and supporting documentation are incomplete and will not be reviewed.

B. The request and supporting documentation shall be submitted concurrently with Civil Engineering Plans, Zoning Compliance Plans, Planned Development, or Specific Use Permit submittal.

9.2.2 Criteria for Granting of Design Deviation

A. The review of a design deviation request by the City's Engineer and Department Reviewer shall assess whether the request:

1. Clearly demonstrates an exceptional hardship which prevents the design criteria from being met. This hardship cannot be solely self-imposed and should be based upon physical characteristics of the property, environmental conditions, or existing conditions created by surrounding development;

2. Is not detrimental to the public welfare;
3. Does not adversely impact the operations of the system or the public facility in question;
4. Is supported by a signed and sealed engineering analysis performed by a Licensed Professional Engineer in the State of Texas, if requested by the Engineering Department; and
5. Shall not be solely to mitigate a financial hardship.

B. The decision of the City's Engineer and Department Reviewer is guided by the criteria for approval, but is ultimately discretionary based on their engineering judgment and professional experience.

C. All approved design deviation requests shall be signed by the City's Engineer and Department Reviewer, before implementation.

D. The decision of the City's Engineer and Department Reviewer to grant a design deviation shall not relieve the applicant's Engineer of the professional obligation and responsibility to ensure any approved alternatives to the use of the material, design, or method of construction are fit for the intended purposes of the facilities at issue.

E. If a design deviation request is denied by the City's Engineer and Department Reviewer, the applicant may consider reviewing alternatives and resubmitting the application with more information as is deemed necessary, for re-evaluation by the City's Engineer and Department Reviewer.

9.3 Revocation of an Approved Design Deviation

9.3.1 Applicability and Procedure

A. An approved design deviation request may be revoked by the City's Engineer and Department Reviewer, if:
1. The supporting documentation that the City's Engineer and Department Reviewer used to review and approve the design deviation request is materially altered or updated. Any individual or entity that receives an approved design deviation request must provide the City's Engineer and Department Reviewer with any change in plans or conditions to the project that affect the requested deviation as soon as practicable after any such change occurs. Failure to provide these updates may result in design deviation revocation by the City.
2. The applicant is shown to have provided inaccurate or incomplete information during review of the design deviation request.
3. The City determines there is a failure to comply with any term, condition, or requirement applicable to a design deviation;

B. A decision to revoke a design deviation is effective immediately. Notice of the decision shall be communicated to the applicant.

Appendix A: Example Stormwater Facility Checklists

INSPECTION CHECKLIST FOR SIMPLE DETENTION BASIN

Facility Name: _____ **Facility Agreement Number:** _____

Basin/Pond Number: _____ **Inspected By:** _____ **Date:** _____

Type of Inspection: Annual _____, Quarterly _____, Monthly _____, Routine _____, or Storm Event _____, (# days since event _____)

Basin Conditions:

1. Is there standing water or wet spots? Yes____No _____Comments _____
2. Does sides or bottom show signs of erosion, settling, cracking, etc? Yes____No _____Comments _____
3. Does dam or emergency spillway show signs of erosion, settling, cracking, or other problems Yes____No _____Comments _____
4. Is there evidence of animal burrowing in dam? Yes____No _____Comments _____
5. Is there evidence of changes in shape or volume of basin? Yes____No _____Comments _____
6. Do vegetated areas need mowing? Yes____No _____Comments _____
7. Are there trees or woody growth in dam? Yes____No _____Comments _____
8. Are there areas that need to be re-vegetated? Yes____No _____Comments _____
9. Is there any accumulation of silt, trash, debris or litter in the basin? Yes____No _____Comments _____
10. Are there any other basin maintenance activities needed? Yes____No _____Comments _____

Structural Components:

1. Are pipes, channels, trash racks, etc. free of obstructions? Yes____No _____Comments _____
2. Are pipes, spillway or trash racks in need of repair? Yes____No _____Comments _____
3. Is the low flow or trickle channel in need of repair? Yes____No _____Comments _____
4. Is the outfall channel in need of repair? Yes____No _____Comments _____
5. Are there any other structural maintenance activities needed? Yes____No _____Comments _____

Plan for correcting deficiencies:

_____

_____

_____

_____

Signature:

_____

Owner's Representative

Date:

_____

ENGINEER'S CHECKLIST FOR STORMWATER
FACILITY MAINTENANCE AGREEMENT

Please attach additional sheets as necessary for comments and descriptions. Fit all sheets to 8½" x 11".

ORGANIZATION INFORMATION	
1. Company (Applicant)	**Address:**
2. Contact's Information: Contact Name Mailing Address Telephone Number(s) Email	**3. Execution Information:** Signatory's Name Mailing Address Telephone Number(s) Email

4. Property Location:
(Note: If the property has not been addressed, please enter the legal description)

5. Associated Plat Numbers:
(Note: if request is related to multiple plat applications, please list each individually)

6. Associated Building Permit Numbers:
(Note: if request is related to multiple permits, please list each individually)

AGREEMENT & ATTACHMENT INSTRUCTIONS

If the property owner is a **corporation**, the agreement must be signed by a person who is duly authorized to bind the corporation including, but not limited to, a President or Vice President. . If a **partnership**, the agreement must be signed by the managing partner. If the applicant is a **sole proprietor**, he/she signs the agreement on behalf of him or herself. Additionally, for corporations and partnerships, a copy of the *Articles of Incorporation*, showing signature authority for whoever signs the agreement must also be submitted (Note: Applicants may also submit a board resolution or power of attorney authorizing an agent or assign to sign on behalf of the property owner. The agreement must be completely filled out and three copies submitted to the Planning and Development Department. Signatures on all three agreement drafts must be original and notarized. Lastly, please submit a copy of the deed for the noted property.

NOTE: Agreement and all attachments should be submitted on 8 ½" x 11".

	Yes	No	N/A	Comments/Descriptions	Page 2 of 3
1. Legal Agreement – Standard agreement form provided by the City.					
2. Exhibit "A" - Legal Description (Attached)					
A. Metes and Bounds.					
B. Surveyor's Drawing, with seal affixed and marked as "Drainage Easement".					
C. Preliminary Plat.					
3. Exhibit "B" - Design Plan and Specifications (Attached)					
A. Design Calculations – in accordance with iSWM.					
B. Schematic Plan (See Example Detention Plan Schematic)- prepared in accordance with approved construction plans:					
• Plan View showing critical structural elements .					
• Critical structural elements are clearly labeled in layman terms.					
• Profile including a longitudinal section showing all critical structural elements with elevations.					
• Cross-sections as needed to show size and general grading. **NOTE: All Schematics should be submitted on 8 ½" x 11".**					
C. Landscaping shown per approved Landscape Plans.					
4. Exhibit "C" - Operations and Maintenance Plan (Attached)					
A. Routine Maintenance Specifications:					
1. Mowing as needed to control weeds and woody plants.					
2. Trash removal from critical structural elements.					
3. Additional maintenance.					
B. Non-routine Maintenance Activities:					
1. Bank repair and stabilization.					
2. Re-vegetation - required when 30% or more of area is unprotected.					

	Yes	No	N/A	Comments/Descriptions
3. Sediment removal from the detention/retention facility when:	___	___	___	_____
• Detention basin – when water depth is reduced 25% or more, or basin does not drain within 72 hours.	___	___	___	_____
• Retention pond – when water depth is 4' or less.	___	___	___	_____
• Sediment traps/forebay – when depth is reduced by 50% or more.	___	___	___	_____
4. Structural repair/replacement for all damaged or deteriorated structures, trickle channel, trash rack, etc.	___	___	___	_____
5. Mechanical equipment repairs.	___	___	___	_____
6. Other maintenance Activities.	___	___	___	_____

5. Exhibit "D" - Maintenance Checklist *

A. Covers ordinary needs, in layman terms.	___	___	___	_____
B. Structural components labeled consistent with Schematic Plan.	___	___	___	_____

*See attached Inspection Checklist for Detention Basin

NOTE: All Exhibits should be submitted on 8 ½" x 11".

(seal)	I certify that this Stormwater Facility Maintenance Agreement, checklist, required attachments, and additional comments, was prepared under my responsible supervision and that the information presented on this checklist and attachments is correct to the best of my knowledge. I also understand that an acceptance of this plan by the City does not waive any City standards or requirements unless a specific waiver request has been submitted and approved. Signed_____Date_____ Print Name:_____

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Appendix B: Design Deviation Request Form

Development Services
401 N. Elm Street, Denton, TX 76201 (940) 349-8541

City of Denton Design Deviation Request Form

Submitted by:_____ Phone:_____ Email:_____
Company:_____ Date:_____

Project Information
City of Denton Project Number:_____ Project:_____
Type of Development:_____
Location:_____ (include map)

Design Deviation Request (Each deviation from criteria requires a separate submittal and will be evaluated independently.)
Specify section of the DCM/DDC/design standard(s) for which a deviation is sought:

Please explain how the project is unable to meet the design criteria.
(This hardship cannot be solely self-imposed and should be based upon physical characteristics of the property, environmental condition, or existing conditions created by surrounding development.)

What other design alternatives have been evaluated to comply with the design criteria, prior to the request for design deviation:

Detailed explanation of requested design deviation:

The deviation request will be evaluated based on the criteria set forth in DCM 8.2.2.

☐ By submitting the design deviation request, the applicant hereby acknowledges and understands the design deviation procedure. (Please check.)

1 of 2

Development Services
401 N. Elm Street, Denton, TX 76201 (940) 349-8541

Supporting Documentation

List and provide attachments supporting the design deviation as stated in the DCM Section 8.2.1.
(drawings, calculations, topographic information, photographs, maps, or other pertinent information)

FOR USE BY THE CITY OF DENTON

Justification of Decision:

Deviation Decision: ☐ Accepted ☐ Denied

Reviewing Department: ☐ Solid Waste ☐ Stormwater ☐ Transportation ☐ Water/Wastewater ☐ Street Light

Department Reviewer:_____ City's Engineer:_____

Date:_____ Date:_____

Signature:_____ Signature:_____

(The deviation request decision must be signed by both the Department Reviewer and the City's Engineer.)

2 of 2

Note: Request the fillable Deviation Request form from your Facilitator.

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Appendix C: Poles and Luminaires - Standard Lighting Fixtures

Figure C.1: Residential Lighting – 20-ft. concrete aggregate pole woth post-top luminaire

Figure C.2: General Street Lighting – Wood (distribution) pole with single-mast arm and cobra head luminaire

Figure C.3: General Street Lighting – 35-ft. white concrete pole with single or double-mast arms and cobra head luminaire

Figure C.4: Historic District Lighting – 12-ft. concrete aggregate pole woth post-top luminaire

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Figure C.5: Alternate General Streetlighting – 35-ft. dark gray steel pole with single or double mast arms and new cobra head luminaire.

Appendix D: Types of Environmentally Sensitive Areas

The City of Denton has identified four distinct ESAs - Floodplains, Riparian Buffers, Water-Related Habitat, and Cross Timbers Upland Habitat. Native plants associated with each ESA are listed below. A complete list of Native Plants is included in Appendix E.

A. Floodplain ESAs exist on the terraced banks surrounding waterways where the land is subject to flooding. The City of Denton uses the most current FEMA Flood Insurance Rate Map (FIRM) to define boundaries of protected Floodplain ESAs. Areas designated as 1% Annual Chance Floodplain, labeled on the FIRM as Zone A or Zone AE, would be classified according to existing conditions as developed or undeveloped floodplains. Areas identified as undeveloped floodplains become protected Floodplain ESAs. Floodplain ESA habitat is often an extension of the more sensitive Riparian Buffer. Typical Floodplain ESA habitat is dominated by tree species that can tolerate intermittent flood events.

B. Riparian Buffer ESAs are adjacent to bodies of water such as wetlands, streams, rivers, ponds and lakes. A healthy functioning Riparian Buffer will have a mix of woody and herbaceous plants. Streams, creeks, and rivers are classified by their duration of flow; there are three types:

   1. Perennials flow continuously except during severe drought.

   2. Intermittent flow only for a portion of the year seasonally or after rainfall.

   3. Ephemerals only flow in direct response to rainfall and will often be dry.

C. Water-Related Habitat ESAs are split into four categories: wetlands, bottomland hardwood forests, springs, and deepwater habitats. These areas are typically found in low-lying areas near bodies of water but can also be isolated low-lying areas that meet characteristics of water-related habitats. These characteristics will likely include hydric soils, signs of hydrology, and hydrophytic vegetation.

   1. Wetlands can be isolated or adjacent and will have all three wetland indicators present: hydric soils, hydrology, and hydrophytic vegetation. Adjacent wetlands are connected to a jurisdictional water body, such as a lake or river, and are subject to federal regulation under the Clean Water Act; isolated wetlands are not connected to surface water bodies and are regulated at the state or city level.

      a. An area shall be classified as a wetland if it meets the Army Corps of Engineers three parameter technical criteria as outlined in the Corps of Engineers 1987 Wetlands Delineation Manual (Section D. Routine Determinations).

      b. The recommended routine method assumes sufficient hydrology and hydric soils if the area in question has over 50% vegetative cover of hydrophytic (facultative-wet and/or obligate as listed in the National Wetland Plant List (NWPL), Great Plains Region, and a clearly defined boundary between the hydrophytic and upland plant communities.

      c. Permitted water quality ponds, roadside ditches, and ponds fed by wells or other sources of artificial hydrology are not considered wetlands.

      d. The Wetlands Classification System (WCS) includes five major Systems: Marine, Estuarine, Riverine, Lacustrine, and Palustrine. The first four include both wetlands and deepwater habitats, but the Palustrine only includes wetland habitats. In North Central

Texas, the predominant wetland types are Riverine, Lacustrine and Palustrine, and are detailed in Table 9-A below.

Table D-1: Predominant Wetland Types of North Central Texas

Wetland Type	Major Characteristics
Riverine	Wetlands and deepwater habitats within a stream or river channel; includes oxbow lakes and sloughs; periodically influenced by flooding
Lacustrine	Wetlands and deepwater habitats associated with large lakes and reservoirs; situated in basins that lack significant tree or shrub cover
Palustrine	All non-tidal wetlands dominated by trees, shrubs, or persistent plants; includes Bottomland hardwood forests, which is the most widespread type of wetland in Texas and includes trees like pecan, sugarberry, and black willow.

2. Bottomland Hardwood Forest ESAs consist of deciduous forested wetlands and river bottoms. Denton defines this habitat as areas containing at least 50 percent of native trees and understory vegetation typically found in a bottomland hardwood forest.

3. Springs are points of natural groundwater discharge that produce flow, a pool of water, or maintain hydrophytic plant communities (refer to Facultative-wet or Obligate plant species as listed in the in the National Wetland Plant List (NWPL), Great Plains Region. Physical indicators include pooling of water, hydrophytic plants, or the presence of a water temperate gradient in a creek or pool.

4. Deepwater habitats are permanently flooded lands lying below the deepwater boundaries of wetlands. Deepwater habitats include environments where surface water is permanent and often deep, so that water, rather than air, is the principal medium within which the dominant organisms live, whether or not they are rooted in, or attached to, the substrate. As in wetlands, the dominant plants are hydrophytic.

Wetlands and deepwater habitats are defined separately because traditionally the term wetlands has not included deep, permanent water; however, both must be considered an ecological approach to classification. The boundary between wetland and deepwater habitats in the riverine and lacustrine systems lies at a depth of 2 meters (6.6 feet) below water; however, if emergent, shrubs or trees grow beyond this depth, their deep-water edge is the boundary.

D. Cross Timber Upland Habitat ESA are deciduous forest interspersed with prairie grasses. It can be split into four vegetative sub-regions. The predominate sub-region found in Denton, TX is the Eastern Cross Timbers. The Eastern Cross Timbers is dominated by Post Oaks and Blackjack Oaks.

Appendix E: Native Plants for ESAs

Table E-1: Native Plants List – Canopy Trees	
Common Name	**Botanical Name**
Red maple	*Acer rubrum*
Texas buckeye	*Aesculus arguta*
Pecan	*Carya illinoiensis*
Texas hickory (Black hickory)	*Carya texana*
Net-leaf hackberry	*Celtis reticulata*
Desert willow	*Chilopsis linearis*
White ash	*Fraxinus americana*
Green ash	*Fraxinus pennsylvanica*
Texas ash	*Fraxinus texensis*
Black walnut	*Juglans nigra*
Ashe juniper (Mountain cedar)	*Juniperus ashei*
Eastern red cedar	*Juniperus virginiana*
Sweetgum	*Liquidambar styraciflua*
Texas red oak	*Quercus buckleyi*
Escarpment live oak	*Quercus fusiformis*
Bur oak	*Quercus macrocarpa*
Blackjack oak	*Quercus marilandica*
Chinquapin oak	*Quercus muehlenbergii*
Shumard oak (Red oak)	*Quercus shumardii*
Bigelow oak	*Quercus sinuata var. breviloba*
Post oak	*Quercus stellata*
Live oak	*Quercus virginiana*
Black willow	*Salix nigra*
Western soapberry	*Sapindus saponaria var.drummondii*
Chittamwood (Gum bumelia)	*Sideroxylon lanuginosum*
Winged elm	*Ulmus alata*
American elm	*Ulmus americana*
Cedar elm	*Ulmus crassifolia*
Slippery elm	*Ulmus rubra*
Prickly ash (Texas hercules club)	*Zanthoxylum hirsutum*

Table E-2: Native Plants List – Small Trees and Shrubs	
Common Name	**Botanical Name**
White buckeye (Texas buckeye)	*Aesculus arguta*
Common beebush (Whitebrush)	*Aloysia gratissima*
Indigobush (False Indigo)	*Amorpha fruticosa*
Roosevelt-weed	*Baccharis neglecta*
Argarita (Mahonia)	*Berberis trifoliolata*
American beautyberry	*Callicarpa americana*
Buttonbush	*Cephalanthus occidentalis*
Eastern redbud	*Cercis canadensis*
Texas redbud	*Cercis canadensis var. texensis*
Roughleaf dogwood	*Cornus drummondii*
Downy hawthorn	*Crataegus mollis*
Greenhawthorn	*Crataegus reverchoni*
Common persimmon	*Diospyros virginiana*
46 Elbowbush	*Forestiera pubescens*
Carolina buckthorn	*Frangula caroliniana (Rhamnus caroliniana)*
Possum-haw	*Ilex decidua*
Yaupon Holly	*Ilex vomitoria*
Texas Walnut (Nogalito, Little walnut)	*Juglans microcarpa*
Mock orange	*Philadepphus pubescens*
Chickasaw plum	*Prunus angustifolia*
Oklahoma plum (Sand plum)	*Prunus gracilis*
Mexican plum	*Prunus mexicana*
Hog plum	*Prunus rivularis*
Hoptree	*Ptelea trifoliata var. mollis*
Flameleaf sumac	*Rhus copallinum*
Smooth sumac	*Rhus glabra*
Buffalo currant	*Ribes aureum*
White prairie rose	*Rosa foliolosa*
Elderberry	*Sambucus nigra var. canadensis*
Eve`s necklace	*Sophora affinis*
Coralberry	*Symphoricarpos orbiculatus*
Mexican buckeye (Texas buckeye)	*Ungnadia speciosa*
Farkleberry	*Vaccinium arboreum*
Rusty blackhaw	*Viburnum rufidulum*
Arkansas yucca	*Yucca arkansana*
Lotebush	*Ziziphus obtusifolia*
Peppervine	*Ampelopsis arborea*
Heartleaf ampelopsis	*Ampelopsis cordata*
Pipevine	*Aristolochia tomentosa*

Table E-2: Native Plants List – Small Trees and Shrubs	
Common Name	**Botanical Name**
Rattan vine	*Berchemia scandens*
Trumpet vine	*Campsis radicans*
Ballonvine	*Cardiospermum halicacabum*
Cowitch (Ivy-treevine, sorrelvine)	*Cissus incisa*
Old-man's-beard	*Clematis drummondii*
Bluebill (Leather-flower)	*Clematis pitcheri*
Carolina snailseed	*Cocculus carolinus*
Sharp-pod morning glory	*Ipomoea cordatotriloba var. cardatrtriloba*
Cotton morning glory	*Ipomoea cordatotriloba var. torreyana*
Coral honeysuckle	*Lonicera sempervirens*
Virginia creeper	*Parthenocissus quinquefolia*
Blackberry	*Rubus oklahomus*
47 Dewberry	*Rubus trivialis*
Greenbriar	*Smilax bona-nox*
Bristly greenbriar	*Smilax tamnoides*
Summer grape	*Vitis aestivalis*
Mustang grape	*Vitis mustangensis*
Riverbank grape	*Vitis riparia*

Table E-3: Native Plants List – Grasses	
Common Name	**Botanical Name**
Elliott's bentgrass (Annual tickle grass)	*Agrostis elliottiana*
winter bentgrass (Tickle grass)	*Agrostis hyemalis*
Big bluestem	*Andropogon gerardii*
Bushy bluestem	*Andropogon glomeratus*
Splitbeard bluestem	*Andropogon ternarius*
Broomsedge bluestem	*Andropogon virginicus*
Oilfield threeawn (Prairie threeawn)	*Aristida oligantha*
Purple threeawn	*Aristida purpurea*
Silver bluestem	*Bothriochloa laguroides*
Sideoats grama	*Bouteloua curtipendula*
Blue grama	*Bouteloua gracilis*
Hairy grama	*Bouteloua hirsuta*
Texas grama	*Bouteloua rigidiseta*
Red grama	*Bouteloua trifida*
Erect brachyelytrum	*Brachyelytrum erectum*
Downy brome	*Bromus pubescens*
Buffalograss	*Buchloe dactyloides*
Broadleaf woodoats (Inland sea-oats)	*Chasmanthium latifolium*
Hooded windmillgrass (Crowfoot grass)	*Chloris cucullata*
Short-spike windmillgrass	*Chloris subdolichostachya*
Tumble windmillgrass	*Chloris verticillata*
Feather finger grass (Showy chloris)	*Chloris virgata*
Carolina jointtail	*Coelorachis cylindrica*
Fall witchgrass	*Digitaria cognata*
American barnyard grass	*Echinochloa muricata*
Canada wildrye	*Elymus canadensis*
Virginia wildrye	*Elymus virginicus*
Gummy lovegrass	*Eragrostis curtipedicellata*
Big-top lovegrass	*Eragrostis hirsuta*
Plains lovegrass	*Eragrostis intermidia*
Spreading lovegrass	*Eragrostis pectinata*
Creeping lovegrass	*Eragrostis reptans*
Poverty droopseed	*Sporobolus vaginiflorus*
White tridens	*Tridens albescens*
Purpletop (redtop, purpletop tridens)	*Tridens flavus*
Longspike tridens	*Tridens strictus*
Eastern gammagrass	*Tripsacum dactyloides*
Prairie trisetum	*Trisetum interruptum*
Browntop signalgrass (Hurrah grass)	*Urochloa fasciculata*

Table E-3: Native Plants List – Grasses	
Common Name	**Botanical Name**
Broadleaf signalgrass	*Urochloa platyphylla*
Texas panicum (Texas signalgrass)	*Urochloa texana*
Common sixweeksgrass	*Vulpia octoflora*

Table E-4: Native Plants List – Herbaceous Wetland	
Common Name	**Botanical Name**
Ear-leaf ammannia	*Ammannia auriculata*
Purple ammannia (Toothcup)	*Ammannia coccinea*
Water-hyssop	*Bacopa monnieri*
Disk water-hyssop	*Bacopa rotundifolia*
Texas bergia (waterwort)	*Bergia texana*
Caric sedge (Benjamin's sedge)	*Carex bushii*
Davis' Caric sedge	*Carex davisii*
Heavy-fruit caric sedge	*Carex gravida*
Few-flower caric sedge	*Carex hyalina*
Foxtail caric sedge	*Carex vulpinoidea*
Taper-leaf flat sedge	*Cyperus acuminatus*
Yellow flat sedge	*Cyperus flavescnes*
Slender flat sedge	*Cyperus lupulinus*
Fragrant flat sedge	*Cyperus odoratus*
Bent-awn flat sedge	*Cyperus reflexus*
One-flower flat sedge	*Cyperus retroflexus*
Sedge	*Cyperus setigerus*
Burhead (Erect burhead)	*Echinodorus berteroi*
Creeping burhead	*Echinodorus cordifolius*
Needle spikerush	*Eleocharis acicularis*
Spikerush	*Eleocharis geniculata*
Spikerush	*Eleocharis monteicensis*
Large-spike spikerush	*Eleocharis palustris*
Dwarf spikerush	*Eleocharis parvula*
Square-stem spikerush	*Eleocharis quadrangulata*
Horsetail (Scouring-rush)	*Equisetum hyemale*
Fimbristylis	*Fimbristylis puberula*
Umbrella sedge	*Fuirena simplex*
Bladderpod (Bagpod)	*Glottidium vesicarium*
Blue mud plantain	*Heteranthera limosa*
Water-pennywort	*Hydrocotyle umbellata*
Dudley's rush	*Juncus dudleyi*
Common rush (Soft rush)	*Juncus effusus*
Ring-seed rush	*Juncus filipendulus*
Inland rush	*Juncus interior*
Grassleaf rush	*Juncus marginatus*
Torrey's rush	*Juncus torreyi*
Water willow	*Justicia americana*
Slender-leaf flat sedge	*Kyllinga pumila*

Table E-4: Native Plants List – Herbaceous Wetland	
Common Name	**Botanical Name**
Frogfruit (Lance-leaf frogfruit)	*Lippia lanceolata*
Frogfruit (Turkey tangle)	*Lippia nodiflora*
Seedbox (Rattlebox)	*Ludwigia alternifolia*
Primrose-willow	*Ludwigia decurrens*
Creeping seedbox (Torrey's seedbox)	*Ludwigia glandulosa*
Water primrose	*Ludwigia prploides*
Floating water primrose (Creeping primrose)	*Ludwigia repens*
Water horehound (American bugleweed)	*Lycopus americanus*
Lance-leaf loosestrife	*Lythrum alatum*
California loosestrife	*Lythrum californicum*
Prostrate water-hyssop	*Mecardonia procumbens*
Lax hornpod	*Mitreola petiolata*
Water pepper (Swamp smartweed)	*Polygonum hydropiperoides*
Pink smartweed	*Polygonum pensylvanicum*
Water smartweed	*Polygonum punctatum*
Pleat-leaf knotweed	*Polygonum tenue*
Pickerelweed	*Pontederia cordata*
Star-rush white-top sedge (Umbrella grass)	*Rhynchospora colorata*
Toothcup	*Rotala remosior*
Common arrowhead (Duck potato, Wapato)	*Sagittaria latifolia*
Delta arrowhead	*Sagittaria platyphylla*
Lizard's tail	*Saururus cernuus*
Giant bulrush	*Schoenoplectus californicus*
Three-square bulrush (American bulrush)	*Schoenoplectus pungens*
Soft-stem bulrush (Great bulrush)	*Schoenoplectus tabernaemontani*
Rattlebush	*Sesbania drummondii*
Southern cattail	*Typha domingensis*
Common cattail	*Typha latifolia*

Table E-5: Native Plants List – Aquatic Plants	
Common Name	**Botanical Name**
Larger waterwort	*Callitriche heterophylla*
Coontail	*Ceratophyllum demersum*
Water stargrass	*Heteranthera dubia*
Umbrella water-pennywort	*Hydrocotyle umbellata*
Lesser duckweed	*Lemna aequinoctialis*
Southern naiad	*Najas guadalupensis*
Lotus	*Nelumbo lutea*
Spatterdock (Cow lily, Yellow pond lily)	*Nuphar advena*
White water-lily	*Nymphaea odorata*
Water-thread pondweed	*Potamogeton diversifolia*
Long-leaf pondweed	*Potamogeton nodosus*
Baby pondweed	*Potamogeton pusillus*
Sago pondweed	*Stuckenia pectinatus*
Cone-spur bladderwort	*Utricularia gibba*
Wild celery (Eel grass)	*Vallisneria americana*
Common poolmat (horned pondweed)	*Zannichelia palustrus*

Table E-6: Native Plants List – Ferns	
Common Name	**Botanical Name**
Engelmann's Adder's tongue	*Ophioglossum engelmannii*
Adder's tongue	*Ophioglossum vulgatum*
Purple cliff-brake	*Pellaea atropurpurea*
Common woodsia	*Woodsia obtusa*

Table E-7: Native Plants List – Cacti	
Common Name	**Botanical Name**
Pinapple cactus	*Coryphantha sulcata*
Pincushion cactus	*Coryphantha vivipara*
Plains nipple cactus	*Escobaria missouriensis*
Eastern prickly-pear	*Opuntia humifusa*
Plains prickly-pear	*Opuntia macrorhiza*
Brown-spine prickly-pear	*Opuntia phaeacantha var. major*
Green-flower cholla (Jumping cactus)	*Opuntia tunicata*

Table E-8: Native Plants List – Forbs (Wildflowers)	
Common Name	**Botanical Name**
Prairie acacia	*Acacia angustissima*
Hop hornbeam	*Acalypha ostryifolia*
Virginia copperleaf	*Acalypha virginica*
Western yarrow	*Achillea millefolium*
Wild onion (Meadow garlic)	*Allium canadense*
Prairie onion	*Allium drummondii*
Blue star (Texas slimpod)	*Amsonia ciliata*
Ble star (Willow slimpod)	*Amsonia tabernaemontana*
Blue funnel lily	*Androstephium coeruleum*
Tenpetal anemone	*Anemone berlandieri*
Carolina anemone	*Anemone caroliniana*
Western rock-jasmine	*Anrdosac occidentalis*
Pussytoes anemone	*Antennaria parlinii*
Arkansas lazy daisy	*Aphanostpehus skirrhobasis*
Prairie dogbane (Indian-hemp)	*Apocynum cannabinum*
Green-dragon (Jack-in-the-pulpit)	*Arisaema dracontium*
Indian plantain	*Arnoglossum plantagineum (Cacalia plantaginea)*
Antelope-horns (trailing milkweed)	*Asclepias asperula*
Butterfly milkweed	*Asclepias tuberosa*
Green-flower milkweed	*Asclepias viridiflora*
Green milkweed	*Asclepias viridis*
Drummond's aster	*Aster drummondii*
Heath aster	*Aster ericoides*
Aromatic aster	*Aster oblongifolius*
Late purple aster	*Aster patens var. gracilis*
Silky aster	*Aster pratensis*
Saltmarsh aster	*Aster subulatus*
Bent-pod milk-vetch	*Astragalus distortus*
Slim-pod milk-vetch	*Astragalus leptocarpus*
Lotus milk-vetch	*Astragalus lotiflorus*
Western daisy	*Astranthium intefrifolium*
Plains wild indigo	*Baptisia bracteata*
Green wild indigo	*Baptisia sphaerocarpa*
Texas green-eyes	*Berlandiera betonicifolia (B. texana)*
Prairie Bishop's weed	*Biflora americana*
Scarlet spiderling	*Boerhavia diffusa*
Erect spiderling	*Boerhavia erecta*
Plains kuhnia (False boneset)	*Brickellia eupatorioides var. corymbulosa*
Plains winecup (Plains poppy-mallow)	*Callirhoe alcaeoides*

Table E-8: Native Plants List – Forbs (Wildflowers)	
Common Name	**Botanical Name**
Winecup (Purple poppy-mallow)	*Callirhoe involucrata*
Palmleaf poppy-mallow (Finger poppy-mallow)	*Callirhoe pedata (C. digitata)*
Sundrops (Squarebud day primrose)	*Calylophus berlandieri*
Yellow sundrops (yellow eveving-primrose)	*Calylophus serrulatus*
Horseherb (Prostrate lawnflower)	*Calyptocarpus vialis*
Wild hyacinth	*Camassia scilloides*
Indian paintbrush	*Castilleja indivisa*
Redroot (Jersey tea)	*Ceanothus herbaceus*
Basketflower	*Centaurea americana*
Mountain pink	*Centaurium beyrichii*
Lady Bird's centaury	*Centaurium texense*
Short-stalked chickweed	*Cerastium brachypodum*
Nodding chickweed	*Cerastium nutans*
Wild cherry	*Chaerophyllum tainturieri*
Common least daily	*Chaetopappa asteroides*
Partridge pea	*Chameachrista fasciculata (Cassia fasciculata)*
Sensitive pea	*Chameachrista nicitans (Cassia nictitans)*
Pit-seed goosefoot	*Chenopodium berlandieri*
Thick-leaf goosefoot	*Chenopodium pratericola*
Soft golden aster (Camphorweed)	*Chrysopsis pilosa*
Tall thistle	*Cirsium altissimum*
Bull thistle	*Cirsium horridulum*
Texas thistle	*Cirsium texanum*
Violet collinsia	*Collinsia violacea*
Erect dayflower	*Commelina erecta*
Texas bindweed	*Convolvulus equitans*
Horseweed	*Conyza canadensis*
Rain-lily	*Cooperia drummondii*
Lance Coreopsis	*Coreopsis lanceolata*
Plains coreopsis	*Coreopsis tinctoria*
Rock coreopsis	*Coreopsis wrightii*
Mealy fumewort	*Corydalis crystallina*
Scratch daisy	*Croptilon hookerianum*
Woolly croton	*Croton capitatus*
Tropic croton	*Croton glandulosus*
One-seeded croton	*Croton monanthogynous*
Texas croton	*Croton texensis*
Buffalo gourd	*Cucubita foetidissima*
Texas Gourd	*Cucurbita texana*

Table E-8: Native Plants List – Forbs (Wildflowers)	
Common Name	**Botanical Name**
Winged pigweed	*Cycloloma atriplicifolium*
Showy prairie clover	*Dalae compacta*
Golden dalea	*Dalea aurea*
White prairie clover	*Dalea candida var candida*
Bigtop dalea	*Dalea enneandra*
Round-head dalea (White prairie clover)	*Dalea multiflora*
Angels Trumpet (Indian apple)	*Datura wrightii*
Rattlesnake-weed	*Daucus pusillus*
Prairie larkspur	*Delphinium carolinianum var. virescens*
Tansy mustard	*Descurainia pinnata*
Illinois bundleflower	*Desmanthus illinoensis*
Prairie bundleflower	*Desmanthus leptolobus*
Panicled tick-clover	*Desmodium paniculatum*
Sessile tick-clover	*Desmodium sessilifolium*
Tweedy's tick-clover	*Desmodium tweedyi*
Pony foot	*Dichondra carolinensis*
Woolly cotton-flower	*Dimorphocarpa wislizenii*
Rough buttonweed	*Diodia teres*
Low silverbush (Low wild mercury)	*Ditaxis humilis*
Shooting star	*Dodecatheon meadia*
Wedge-leaf draba (Whitlow-wort)	*Draba cuneifolia*
Broad-pod draba	*Draba platycarpa*
Carolina draba	*Draba reptans*
Clasping coneflower	*Dracopis amplexicaulis*
Snake Herb	*Dyschoriste linearis*
Blacksamson	*Echinacea angustifolia*
Purple coneflower	*Echinacea atrorubens*
Yarva de tajo (Pieplant)	*Eclipta prostrata*
Englemann daisy	*Englemannia peristenia (E. pinnatifida)*
Basin fleabane	*Erigeron geiseri*
Philadelphia fleabane	*Erigeron philadelphicus*
Annual wild buckwheat	*Eriogonum annuum*
Longleaf wild buckwheat	*Eriogonum longifolium*
Heart-sepal wild buckwheat	*Eriogonum multiflorum*
Prairie fleabane	*Eriogonum strigosus*
Texas stork's bill	*Erodium texanum*
Brushy eryngo	*Eryngium diffusum*
Hooker's enyngo	*Eryngium hookeri*
Leavenworth eryngo	*Eryngium leavenworthii*

Table E-8: Native Plants List – Forbs (Wildflowers)	
Common Name	**Botanical Name**
Rattlesnake master (Button snakeroot)	*Eryngium yuccifolium*
Western wallflower	*Erysimum capitatum*
Tall thoroughwort	*Eupatorium altissimum*
Blue mist flower	*Eupatorium coelestinum*
Late-flowering boneset	*Eupatorium serotinum*
Snow-on-the-prairie	*Euphorbia bicolor*
Fire-on-the-mountain	*Euphorbia cyanthophora*
Tootherd spurge	*Euphorbia dentata*
Snow-on-the-mountain	*Euphorbia marginata*
Weak spurge	*Euphorbia tetrapoda*
Texas spreadwing	*Eurytaenia texana*
Bluebells	*Eustoma russellianum (E. grandiflorum)*
Big-head pygmycudweed	*Evax prolifera*
Spring pygmycudweed	*Evax verna*
Shaggy dwarf morning-glory	*Evolvulus nuttallianus*
Silver dwarf morning-glory	*Evolvulus sericeus*
Florida snake cotton	*Froelichia floridana*
Prairie gaillardia (Lanceleaf gaillardia)	*Gaillardia aestivalis*
Indian blanket	*Gaillardia pulchella*
Fragrant gaillardia	*Gaillardia sauvis*
Woods bedstraw (Wild licorice)	*Galium circaezans*
Hairy bedstraw	*Galium pilosum*
Plains gaura	*Gaura brachycarpa*
Sweet gaura (Beeblossom)	*Gaura drummondii*
Velvetweed (Lizard-tail gaura)	*Gaura parviflora*
Wavy-leaf gaura (Wavyleaf beeblossom)	*Gaura sinuata*
Wild honeysuckle	*Gaura suffulta*
Crane's bill (Carolina geranium)	*Geranium carolinianum*
White avens	*Geum canadense*
Dakota vervain	*Glandularia bipinnatifida (Verbena bipinnatifida)*
Rose vervain	*Glandularia canadensis (Verbena canadensis)*
Bladderpod (Bagpod)	*Glottidium vesicarium*
Lonestar gumweed (Little-head gumweed)	*Grindelia adenodonta*
Narrow-leaf gumweed	*Grindelia lanceolata*
Prairie bluets	*Hedyotis nigricans*
Common sunflower	*Helianthus annuus*
Texas blueweed (Blue-weed sunflower)	*Helianthus cilaris*
Maximilian Sunflower	*Helianthus maximiliani*
India heliotrope (turnsole)	*Heliotropium indicum*

Table E-8: Native Plants List – Forbs (Wildflowers)	
Common Name	**Botanical Name**
Pasture heliotrope	*Heliotropium tenellum*
Bladdermallow (Net-Vein herissantia)	*Herissantia crispa*
Gray golden-aster	*Heterotheca canescens*
Camphorweed	*Heterotheca subaxillaris*
Hawkweed	*Hieracium gronovii*
Nodding green violet	*Hybanthus verticillatus*
Carolina wooly-white (Old-plainsman)	*Hymenopappus acabiosaeus*
Old-plainsman (Woolly-white)	*Hymenopappus artemisifolius*
Spotted St. John's wort	*Hypericum punctatum*
Scarlet pea	*Indigofera miniata*
Standing cypress	*Ipomopsis rubra*
Sumpweed (Marsh-elder)	*Iva annua*
Warty calrop	*Kallstroemia parviflora*
Trailing ratany	*Krameria lanceolata*
Virginia dwarfdandelion	*Krigia virginica*
Wright's dwarfdandelion	*Krigia wrightii*
Wild lettuce	*Lactuca canadensis*
Western wild lettuce	*Lactuca ludoviciana*
Narrow-leaf pinweed	*Lechea tenuifolia*
Virginia pepperweed	*Lepidium virginicum*
Hairy bush-clover	*Lespedeza hirta*
Trailing bush-clover	*Lespedeza procumbens*
Tall bush-clover	*Lespedeza stuevei*
Slender lepedeza	*Lespedeza virginicum*
White bladderpod	*Lesquerella gracilis*
Narrow-leaf conobea	*Leucospora multifida*
Tall gayfeather (Tall blazing star)	*Liatris aspera*
Pink-scale gayfeather (Handsome blazing star)	*Liatris elegans*
Narrow-leaf gayfeather	*Liatris mucronata*
Prairie blazing star (Kansas gayfeather)	*Liatris pynchostachya*
Smooth gayfeather (Scaly blazing star)	*Liatris squarrosa var. glabrata*
Arkansas dogshade	*Limnosciadium pinnatum*
False pimpernel	*Lindernia dubia*
Texas yellow star	*Lindheimera taxana*
Small meadow flax	*Linum pratense*
Stiffstem flax	*Linum rigidum*
Puccoon (Carolina gromwell)	*Lithospermum caroliniense*
Narrowleaf gromwell (Narrowleaf puccoon)	*Lithospermum incisum*
Cardinal flower	*Lobelia cardinalis*

Table E-8: Native Plants List – Forbs (Wildflowers)	
Common Name	**Botanical Name**
Carrot-leaf lomatium	*Lomatium foeniculaceum*
Deervetch (Prairie trefoil)	*Lotus purshianus (L. unifoliolatus)*
Texas bluebonnet	*Lupinus texensis*
Texas skeleton plant	*Lygodesmia texana*
Turks Cap (Wax mallow)	*Malvaviscus arboreus v. drummondii*
Barbara's buttons (Puffballs)	*Marshallia caespitosa*
Creeping cucumber	*Melothria pendula*
Stickleaf (Chickenthief)	*Mentzelia oilgosperma*
White four-o'clock	*Mirabilis albida*
Giant four-o'clock	*Mirabilis gigantea*
Narrow-leaf four-o'clock	*Mirabilis linearis*
Wild four-o'clock	*Mirabilis nyctaginea*
Carolina bristlemallow	*Modiola caroliniana*
Lemon mint (Lemon beebalm)	*Monarda citriodora*
Basil beebalm	*Monarda clinopodioides*
Wild bergamont	*Monarda fistulosa*
Spotted beebalm	*Monarda punctata*
Poverty-weed	*Monolepis nuttalliana*
Spring forget-me-not	*Myosotis macrosperma*
Southern forget-me-not	*Myosotis verna*
tiny mousetail	*Myosurus minimus*
Prairie celestial	*Nemastylis geminiflora*
Yellow puff	*Neptunia lutea*
Crow poison (False garlic)	*Nothoscordum bivalve*
Texas toad-flax	*Nuttallanthus texanus*
Scarlet muskflower	*Nyctaginia capitata*
Cutleaf evening primrose	*Oenothera laciniata*
Four-point evening primrose	*Oenothera rhombipetala*
Spack evening primrose	*Oenothera spachiana*
Showy evening primrose	*Oenothera speciosa*
Stemless evening primrose	*Oenothera triloba*
Soft-hair marbleseed	*Onosmodium bejariense*
Aniseroot	*Osmorhiza longistylis*
Common yellow oxalis	*Oxalis stricta*
Violet woodsorrel	*Oxalis violacea*
Prairie groundsel	*Packera plattensis (Senecio plattensis)*
Small palafoxia	*Palafoxia callosa*
Rose palafoxia	*Palafoxia rosea*
Passionflower	*Passiflora incarnata*

Table E-8: Native Plants List – Forbs (Wildflowers)	
Common Name	**Botanical Name**
Tall-bread scurf-pea	*Pediomelum cuspidata (Psoralea cuspidata)*
Rock scurf-pea	*Pediomelum reverchonii (Psoralea reverchonii)*
Round-leaf scurf-pea	*Pediomelum rhombifolium*
Foxglove	*Penstemon cobaea*
Beardtongue	*Penstemon laxiflorus*
Blue curls	*Phacelia congesta*
Annual phlox (Pride-of-Texas)	*Phlox drummondii var. mcallisterii*
Prairie Phlox	*Phlox pilosa*
Drummond's leaf-flower	*Phyllanthus abnormis*
Knotweed leaf-slower	*Phyllanthus polygonoides*
Cut-leaf ground-cherry	*Physalis angulata*
Beach ground-cherry	*Physalis cinerascens*
Downy groundcherry (Husk tomato)	*Physalis pubescens*
Finger flase dragonhead	*Physostegia digitalis*
Beautiful false dragonhead	*Physostegia pulchella*
Obedient Plant	*Physostegia virginiana var. praemorse*
Pokeweed	*Phytolacca americana*
Bracted plantain (Bottlebrush plantain)	*Plantago aristata*
Prairie plantain (Slender plantain)	*Plantago elongata*
Slender plantago (Slim-spike plantago)	*Plantago heterophylla*
Bristle-bracted plantain	*Plantago patagonica*
Red-seed plantain (Tallow-weed)	*Plantago rhodosperma*
Pale-seed plantain	*Plantago virginica*
Purple pluchea (Marsh fleabane)	*Pluchea odorata*
Clammyweed	*Polansia dodecandra*
White milkwort	*Polygala alba*
Pink milkwort (Procession flower)	*Polygala incarnata*
Pleat-leaf knotweed	*Polygonum tenue*
Juniper-leaf	*Polypremum procumbens*
Prairie parsley	*Polytaenia nuttallii*
Common selfheaf (Heal-all)	*Prunella vulgaris var. lanceolata*
Edible scurf-pea	*Psoralea hypogaeum var. subulatum*
Wild alfalfa (Slim-leaf scurf-pea)	*Psoralea tenuiflora*
Mock bishop's weed	*Ptilimnium nuttallii*
False dandelion (Carolina desert-chickory)	*Pyrrhopappus carolinianus*
Texas dandelion (Smallflower desert-chickory)	*Pyrrhopappus pauciflorus*
Mexican hat (Upright prairie coneflower)	*Ratibida columnifera*
Pigeonberry (Rougeplant)	*Rivina humilis*
Blackeyed Susan	*Rudbeckia hirta*

Table E-8: Native Plants List – Forbs (Wildflowers)	
Common Name	**Botanical Name**
Low ruellia	*Ruellia humilis*
Pale dock	*Rumex altissimus*
Heart-wing sorrel	*Rumex hastatulus*
Meadow pink	*Sabatia campestris*
Buckley's sabatia	*Sabatia formosa*
Trailing pearlwort	*Sagina decumbens*
Blue sage	*Salvia azurea*
Tropical sage	*Salvia coccinea*
Engelmann's sage	*Salvia engelmannii*
Mealycup sage	*Salvia farinacea*
Texas sage	*Salvia texana*
Thin-leaf brookweed	*Samolus valerandi*
Black snakeroot	*Sanicula canadensis*
Catclaw sensitive briar	*Schrankia nuttallii (Mimosa nutallii)*
Roemer sensitive briar	*Schrankia roemeriana (Mimosa roemeriana)*
Small scullcap	*Scutellaria parvula*
Wright's skullcap	*Scutellaria wrightii*
Yellow stonecrop	*Sedum nuttallianum*
Texas groundsel	*Senecio ampullaceus*
Cofee-bean	*Sesbania herbacea (S. macrocarpa)*
Rock cress	*Sibara virginica*
Bur cucumber	*Sicyos angulatus*
Spreading fanpetal	*Sida abutifolia*
Prickly fanpetals	*Sida spinosa*
Sleepy catchfly	*Silene antirrhina*
Widow's frill	*Silene stellata*
Compassplant	*Silphium laciniatum*
Sword-leaf blue-eyed grass	*Sisyrinchium chilense*
Dotted blue-eyed grass	*Sisyrinchium pruinosum (S. langloisii)*
American nightshade	*Solanum ptychenthum (Solanum americanum)*
Common goldenrod	*Solidago canadensis*
Tall goldenrod	*Solidago gigantea*
Stiff goldenrod	*Solidago rigida*
Elm-leaf goldenrod	*Solidago ulmifolia*
Forked scaleseed	*Spermolepis divaricata*
beggar's-lice (Bristly scaleseed)	*Spermolepis echinata*
Spreading scaleseed	*Spermolepis inermis*
Slender ladies' tresses	*Spiranthes lacera*
Mousesear	*Stachys crenata*

Table E-8: Native Plants List – Forbs (Wildflowers)	
Common Name	**Botanical Name**
False gaura	*Stenosiphon linifolius*
Smooth jewelflower (Smooth twistflower)	*Streptanthus hyacinthoides*
Trailing wild bean	*Strophostyles helvola*
Smooth-seed wild bean	*Strophostyles leiosperma*
Sunbright (Prairie flameflower)	*Talinum parviflorum*
Goat's rue (Virginia tephrosia)	*Tephrosia virginiana*
Sawtooth nerveray	*Tetragonotheca ludoviciana*
Fineleaf four-nerve daisy	*Tetraneuris linearifolia (Hymenoxys linearifolia)*
Wood sage	*Teucrium canadense*
Greenthread	*Thelesperma filifolium*
Small Bristle-leaf (Tiny Tim)	*Thymophylla tenuiloba*
Ohis spiderwort	*Tradescantia ohioensis*
Tharp's spiderwort	*Tradescantia tharpii*
Peanut clover	*Trifolium polymorphum*
Venus' looking glass	*Triodanis holzingeri*
Slender-leaved Venus looking-glass	*Triodanis leptocarpa*
Hen and Chickens	*Triodanis perfoliata*
Beaked cornsalad	*Valerianella radiata*
Wood's cornsalad	*Valerianella woodsiana*
Bracted vervain	*Verbana bractaeta*
Texas vervain	*Verbena halei*
Hoary vervain	*Verbena stricta*
White vervain	*Verbena urticifolia*
Gulf vervain (Course vervain)	*Verbena xutha*
Cowpen daisy (Golden crownbeard)	*Verbesina encelioides*
White Crownbeard (Frostweed, Iceplant)	*Verbesina virginica*
Western ironweed	*Vernonia baldwinii*
Purslane speedwell (Neckweed)	*Veronica peregrina*
Blue violet	*Viola palmata*
Common blue violet	*Viola sororia*
Carolina violet	*Viola villosa*
Prairie brazoria	*Warnockia scutellarioides*
Orange zexmenia	*Wedelia texana (Zexmenia hispida)*
Texas sleepy daisy	*Xanthisma texanum*

City of Denton Design Criteria Manual

Updates

Mike Linder, PE, CFM
Drainage Engineer
Engineering Services

Dec. 15, 2025

Agenda

- Public Outreach Plan
- Background
- City Criteria Manual Updates
  - Solid Waste and Recycling
  - Stormwater and Drainage
  - Transportation
  - Water and Wastewater
  - Streetlight Design
  - Environmentally Sensitive Areas
  - Design Deviations
- Next Steps
- Technical Experts in Attendance
  - Art Garcia, SC, PMP
  - Michael Linder, PE, CFM
  - Jennifer Rovezzi, CFM
  - Rakibul Alam, Ph.D.
  - Robert Applegate, EIT
  - Aaron Bennion

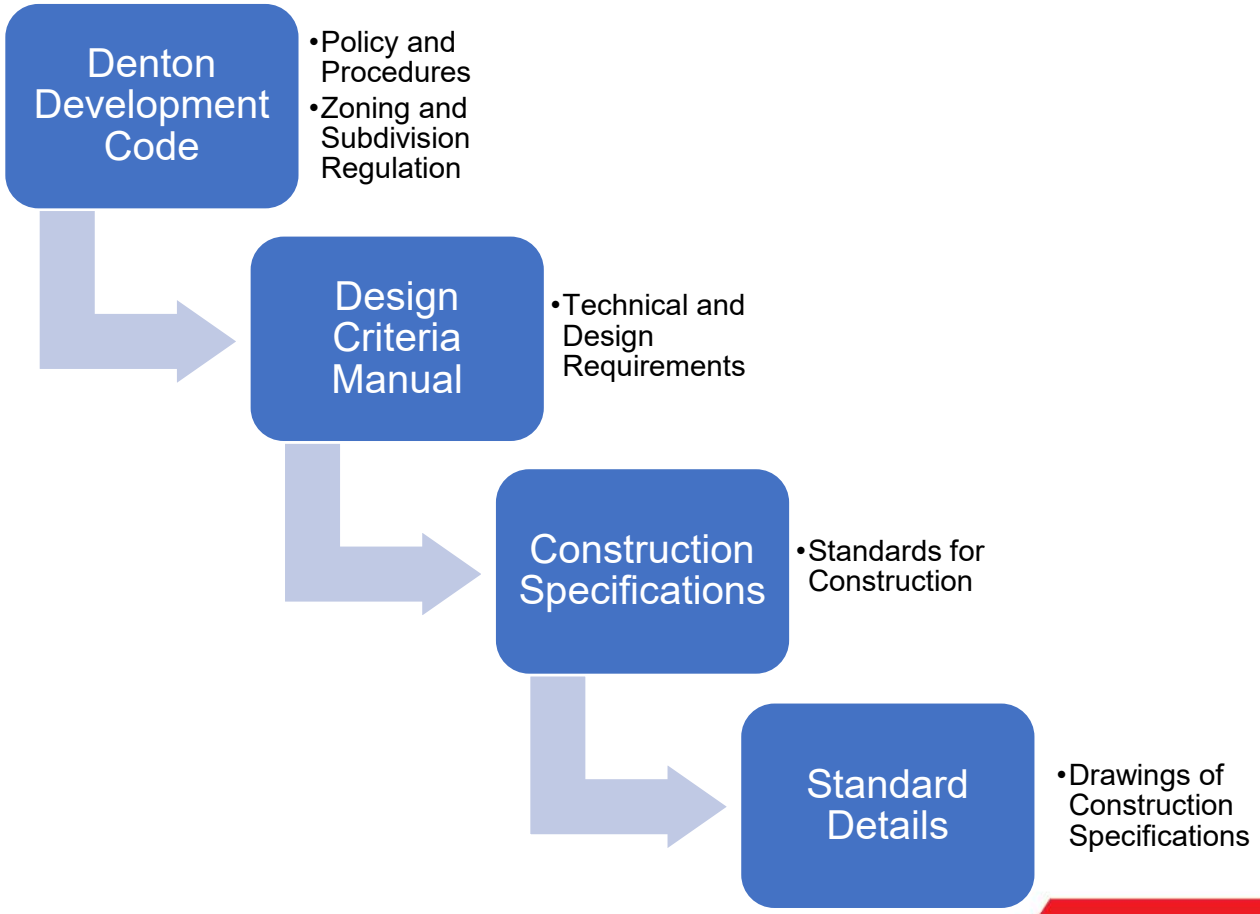
Public Outreach Plan

Date	Public Outreach
September 2, 2025	Denton Developer Community Update
October 22, 2025	Developer Town Hall
October 22, 2025	Planning and Zoning Commission Work Session
October 24, 2025	Criteria Manual Updates Published Online
November 13, 2025	Texas Society of Professional Engineers
December 15, 2025	Public Utilities Board Work Session
December 17, 2025	Mobility Committee Work Session
December 22, 2025	Advertise in Denton Record Chronicle
January 13, 2025	Public Hearing
February 1, 2026	Effective Date

Background

- Criteria Manual Updates
  - Reviewed by Staff
    - Comments addressed by subject mater experts and reviewed by staff in a series of meetings in September
  - Comments from the Public
  - Public Outreach
  - Website Publication
  - Newspaper Publication
  - City Council Work Session and Public Hearing

Governing Documents for the City



Solid Waste and Recycling Criteria Manual Updates

- Provided additional guidance on side-load enclosures for situations where typical front-load enclosure can not fit

Stormwater Design Criteria Manual Updates

- Allow the use of polypropylene pipe in the public storm drain system

- Require that any development disturbing more than one acre must treat the stormwater runoff from impervious surfaces to remove pollutants in accordance with iSWM
  - This was included as a recommendation in the previous update

Transportation Criteria Manual Updates

- Added a new street classification – ‘Major Collector’
- Added traffic management plan for school-related development projects
- Removed the Bike-Ped Traffic Impact Analysis requirement
- Updated Traffic Calming measures
- Updated ‘on-street’ parking

Water and Wastewater Criteria Manual Updates

- Revised organization of sections
- Require geotechnical studies and recommendations during design
- Add cathodic protection design criteria requirements for approved metallic pipe
- Additional requirements for lift stations to improve planning, emergency provisions, and station monitoring

Streetlight Criteria Manual Updates

- Added new style of light pole

- Clarified the process for requesting the addition or removal of streetlighting

Environmentally Sensitive Areas Criteria Manual

- Provided criteria for identifying Environmentally Sensitive Areas
- Provided criteria for assessing Environmentally Sensitive Areas
- Provided criteria for preserving and restoring Environmentally Sensitive Areas

Next Steps

- Present updates to Mobility Committee on December 17, 2025
- Public Hearing and Propose Adoption on January 13, 2025
- Effective Date of February 1, 2026

Questions?

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