From: Smartsheet Automation
To: Pulido, Kristen
Subject: West Oak Coffee Bar has completed the Downtown Reinvestment Grant form
Date: Saturday, September 6, 2025 11:52:05 AM

This message has originated from an **External Source**. Please be cautious regarding links and attachments.

<!--[if !mso]--> <!--[endif]-->

West Oak Coffee Bar has completed the Downtown Reinvestment Grant form

West Oak Coffee Bar has completed the Downtown Reinvestment Grant form:

• Address: 114 West Oak Street

• Type of work: Utility Upgrades, Facade & Building Renovation, Impact Fees, Interior/Code Improvements

• Planned Improvements: The space has been vacant for over the past 50 years so we will be bringing the building completely up to code, restoring as much of the original details as possible and finishing the space in an elegant finish out.

All new:
electric
plumbing
HVAC
decor
lighting

• Total Cost: 362132

• Total Grant Request: 50000

Additional Notes:

DRG App Data

Details Changes since 9/6/25, 11:49 AM

1 row added

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1 row added or updated (shown in yellow)

Row 1

Business name	West Oak Coffee Bar
Created date	09/06/25, 11:49 AM
Applicant name	Matthew Fisher
Applicant mailing address	114 West Oak Street
Phone number	+1 [redacted]
Email	[redacted]
Building owner different from applicant?	Yes
Building owner (if different from applicant)	Melinda McBride
Building owner phone	[redacted]
Building owner email	[redacted]
Building name	West Oak Coffee Bar
Project site/address	114 West Oak Street
Type of work	Utility Upgrades Facade & Building Renovation Impact Fees Interior/Code Improvements
Planned Improvements Details	The space has been vacant for over the past 50 years so we will be bringing the building completely up to code, restoring as much of the original details as possible and finishing the space in an elegant finish out. All new: electric plumbing HVAC decor lighting
Downtown	West Oak has been serving Denton for over the past 10 years. In that

benefit	time we have grown deep roots in the community. We provide space for all aspects of life to happen, from business meetings, celebrations, dates, job interviews...anything that brings people together and this project will allow us to expand our service to the people of Denton. We also hope invite a large number of guests in as well with the hope they will explore the rest of the Denton square
General or fire suppression application	General grant categories
Facade/building rehab cost	10200
Facade/building rehab requested grant	1408
Awnings cost	0
Awnings requested grant	0
Signs cost	0
Signs requested grant	0
Impact fees cost	18300
Impact fees requested grant	2527
Utility upgrades cost	158130
Utility upgrades requested grant	21833
Interior/code improvements cost	175502
Interior/code improvements requested grant	24232
Fire suppression system cost	

Fire suppression system requested grant	
Total cost (submission)	362132
Total cost (Smartsheet)	362132
Total grant request (submission)	50000
Total grant request (Smartsheet)	50000
Message Details	

Changes made by web-form@smartsheet.com

You are receiving this email because you are subscribed to a workflow "New application notification" (ID# 6133402949707652) on sheet DRG App Data
Exclude your changes from all notifications | Unsubscribe
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DOWNTOWN REINVESTMENT GRANT AGREEMENT FORM

Please complete and return with the Downtown Reinvestment Grant Application to the Economic Development office, 401 N. Elm St., Denton, Texas. If you have any questions, please contact the Economic Development Department at 940- 349-7776.

I have met with a representative from the Economic Development Department, and I have read and fully understand the Downtown Reinvestment Grant procedures established by the Denton City Council. I intend to use this grant program for the aforementioned renovation projects to advance the efforts of revitalization and historic preservation of Denton's historic downtown. *I have not received, nor will I receive insurance monies for this revitalization project.*

I understand that if I am awarded a Downtown Reinvestment Grant by the City of Denton, any deviation from the approved project may result in the partial or total withdrawal of the grant. (If I am awarded a reinvestment grant for facade, awning or sign work and the facade, sign or awning is altered for any reason within **one (1) year** from construction, I may be required to reimburse the City of Denton immediately for the full amount of the grant.)

West Oak Coffee Bar

Business/Organization Name

Matthew Fisher 9/4/25

Applicant's Signature *Printed Name* *Date*

Melinda McBride 9/5/25

Building Owner's Signature (if different from applicant) *Printed Name* *Date*

This section is to be completed by Economic Development staff.

Date considered by DEDC *Recommendation* *Staff Signature*

Date considered by TIRZ #1 Board *Recommendation* *Staff Signature*

Date considered by City Council *Approval* *Staff Signature*

Planning Division | Development Services
401 N Elm St., Denton, TX 76201 • (940) 349-8532

November 4, 2025

Mattea Minor
West Oak Coffee Bar
114 W Oak Street
Denton, TX 76201

RE: 114 W Oak Street –Restoring Original Window Openings

Dear Ms. Minor:

Pursuant to Section 4.10.7 of the Denton Development Code,

Historic Preservation Standards

1. *Existing window openings must remain and must not be filled in or covered over.*

Per staff's review of the material provided, and per Section 4.10.7 above, a Certificate of Design Consistency (DCC) is approved for the restoration of the original window openings at 114 W Oak Street. The scope of work is further shown in **Exhibit A**. Please note that any work that deviates from the work proposed in **Exhibit A** will require a new DDC.

Please use this approval letter as a record of staff's review. If you have any questions or require additional information, please contact me at (940) 349-8532 or via email at cameron.robertson@cityofdenton.com.

Sincerely,

Cameron Robertson

Cameron Robertson, AICP
Historic Preservation Officer

Exhibit A

Existing Conditions

Proposed

- Place Pella Impervia Fixed Frame (Picture) Windows in the presently enclosed, boarded up window openings.
- Will provide a stationary view and let in natural light into the second-story without being operable.
- Note: Window specs available upon request

Product Selection Guide
- Size and Performance Data F-FFDS-2
- Features and Options F-FFDS-3

Glazing Performance
- Dual-Pane F-FFDS-4
- Dual-Pane Laminated for Sound F-FFDS-17
- Dual-Pane Impact-Resistant Laminated F-FFDS-19
- Triple-Pane F-FFDS-21

Grille Types F-FFDS-25
Special Size Charts F-FFDS-26
Composite Configurations F-FFDS-27
Impact-Resistant Certifications and Approvals F-FFDS-28
Detailed Product Descriptions F-FFDS-29
Unit Sections
- Dual-Pane Single Units F-FFDS-31
- Dual-Pane Composites F-FFDS-32
- Triple-Pane Single Units F-FFDS-33
- Triple-Pane Composites F-FFDS-34
- Impact-Resistant Laminated Glass Single Units F-FFDS-35

Document Navigation Tips:

Items listed in the table of contents above are active links that will take you to the corresponding page.

The Pella logo on each page is a link back to this table of contents.

Bookmarks are also included in this PDF document and are available as an additional navigation option.

Supporting documents for this product:

Test Reports:
https://media.pella.com/professional/adm/CertificationReports/Test_Reports_IMP.pdf?utm_source=pdfdoc

CSI Specs (readable using Microsft Word or other text editing application):
https://media.pella.com/professional/adm/Fiberglass-CSI_Specs/08572_FF.rtf?utm_source=pdfdoc

AIA Masterspec (readable using Microsft Word or other text editing application):
https://media.pella.com/professional/adm/Fiberglass-CSI_Specs/085413_fl.doc?utm_source=pdfdoc

Detailed Product Description (readable using Microsft Word or other text editing application):
https://media.pella.com/professional/adm/Fiberglass/F2-FFDS.rtf?utm_source=pdfdoc

CAD cross sections (requires appropriate CAD software to read and use):
https://media.pella.com/professional/adm/Fiberglass/IMP-FF-Detail_D.dwg?utm_source=pdfdoc

3D & BIM (requires appropriate software to read and use):
https://media.pella.com/professional/adm/RevitFiles/Imp-Revit/Window-Fixed-Pella-Impervia-Block_Frame.zip?utm_source=pdfdoc

Sketchup (requires appropriate software to read and use):
https://media.pella.com/professional/adm/Fiberglass/PellaSKP_Impervia_Fixed_Frame.zip?utm_source=pdfdoc

Combination Recommendations:
https://media.pella.com/professional/adm/Fiberglass/F2_Combinations.pdf?utm_source=pdfdoc

Installation Details:
https://media.pella.com/professional/adm/Fiberglass/Pella-Impervia_InstallationDetails.pdf?utm_source=pdfdoc

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The information published in this document is believed to be accurate at the time of publication. However, because we are constantly working to improve our products, specifications are subject to change without notice. Consult your local Pella representative for up-to-date product information.

Size and Performance Data

	Standard
Sizes	
Special Sizes	●
Performance[1]	
Meets or Exceeds AAMA/WDMA Ratings	FW - CW +50 / -55 Hallmark Certified
Air Infiltration (cfm/ft² of frame @ 1.57 psf wind pressure)	0.05
Water Resistance	7.5 psf
Design Pressure	30 - 50 psf
Products with Impact-Resistant Laminated Glass	FW - LC +50 / -55 Missle C, Windzone 2 Hallmark Certified
Other Performance Criteria	
Forced Entry Resistance Level (Minimum Security Grade)[2]	40

Sound Transmission Class and Outdoor-Indoor Transmission Class

Frame Size Tested[3]	Glazing System				STC Rating	OITC Rating
	Overall Glazing Thickness	Exterior Glass Thickness	Interior Glass Thickness	Third Pane Thickness		
Fixed Frame Direct Set						
47-1/2" x 59-1/2"	1"	3mm	3mm	—	28	23
47-1/2" x 59-1/2"	1"	4mm	4mm	—	30	24
47-1/2" x 59-1/2"	1"	5mm	5mm	—	31	25
47-1/2" x 59-1/2"	1"	6mm	6mm	—	32	27
47-1/2" x 59-1/2"	1"	5mm	3mm	—	31	27
47-1/2" x 59-1/2"	1"	4mm	6mm	—	33	28
47-1/2" x 59-1/2"	1"	4mm	7mm Laminated	—	33	28
47-1/2" x 59-1/2"	1"	5mm	10mm Laminated	—	36	31
47-1/2" x 59-1/2"	1-1/4"	3mm	3mm	3mm	28	22
47-1/2" x 59-1/2"	1-1/4"	4mm	4mm	4mm	30	25
47-1/2" x 59-1/2"	1-1/4"	5mm	5mm	5mm	31	26
47-1/2" x 59-1/2"	1-1/4"	6mm	6mm	6mm	34	28

S = Standard; O = Optional

(1) See Design Data pages in this section for specific product performance class and grade values.

(2) The higher the level, the greater the product's ability to resist forced entry.

(3) ASTM E 1425 defines standard sizes for acoustical testing. Ratings achieved at that size are representative of all sizes of the same configuration.

All sizes and glass types are tested for air/water/structural and impact-resistance.

	Block Frame
Glazing	
Glazing Type	
Dual-pane Insulating Glass	S
Triple-pane Insulating Glass	O
Insulated Glass Options / Low-E Types	
Clear Insulating Glass (no Low-E coating)	S
Advanced Low-E Insulating Glass	O
SunDefense™ Low-E Insulating Glass	O
SunDefense+ Low-E Insulating Glass	O
AdvancedComfort Low-E Insulating Glass	O
NaturalSun Low-E Insulating Glass	O
NaturalSun+ Low-E Insulating Glass	O
Additional Glass Options	
Annealed Glass	S
Tempered Glass	O
Impact-Resistant Laminated Glass	O
Noise reduction glass (5/3mm, 4/6mm combinations)	O
Noise reduction laminated glass (4/7mm, 5/10mm non-impact)	O
Tinted glass (Bronze, Gray, Green) Advanced Low-E	O
Obscure Glass[1]	O
Spandrel Glass	O
Gas Fill / High Altitude	
Argon	S
High Altitude	O
High Altitude with argon	O
Exterior / Interior Factory Pre-finish Colors	
Powder-Coat White	S
Powder-Coat Brown, Black, Tan or Morning Sky Gray	O
Powder-Coat Dual-color (Brown, Black, Tan or Morning Sky Gray exterior with White interior)	O
Grilles	
Grilles-Between-the-Glass	
Traditional, Prairie, Top Row	O
Applied Grilles	
Equally Divided, Unequally Divided and Top Row	O

S = Standard; O = Optional

(1) Contact your local Pella sales representative for current offering.

Glazing Performance - Total Unit

Glazing Thickness	Type of Glazing	NFRC Certified Product #	Glass (mm)		Gap Fill	U-Factor	SHGC	VLT	CR	Shaded Areas Meet ENERGY STAR® Performance Criteria in Zones Shown					
			Ext.	Int.						U. S.				Canada	
										Zone				ER	Zone
Fixed										N	NC	SC	S		CA
1"	Clear IG	PEL-N-257-00001-00001	3	3	air	0.46	0.68	0.72	45						
	with grilles-between-the-glass	PEL-N-257-00001-00002				0.46	0.61	0.64	45						
	with applied grilles	PEL-N-257-00001-00005				0.46	0.55	0.57	45						
1"	Clear IG	PEL-N-257-00003-00001	4	4	air	0.45	0.66	0.71	45						
	with grilles-between-the-glass	PEL-N-257-00003-00002				0.45	0.60	0.64	45						
	with applied grilles	PEL-N-257-00003-00005				0.45	0.53	0.57	45						
1"	Clear IG	PEL-N-257-00005-00001	5	5	air	0.45	0.65	0.71	45						
	with grilles-between-the-glass	PEL-N-257-00005-00002				0.45	0.59	0.63	45						
	with applied grilles	PEL-N-257-00005-00005				0.45	0.53	0.56	45						
1"	Clear IG	PEL-N-257-00007-00001	6	6	air	0.45	0.63	0.70	44						
	with grilles-between-the-glass	PEL-N-257-00007-00002				0.45	0.57	0.62	44						
	with applied grilles	PEL-N-257-00007-00005				0.45	0.51	0.56	44						
1"	Advanced Low-E IG	PEL-N-257-00014-00001	3	3	argon	0.27	0.32	0.61	58						
	with grilles-between-the-glass	PEL-N-257-00014-00002				0.27	0.29	0.55	58						
	with applied grilles	PEL-N-257-00014-00005				0.27	0.26	0.49	58						
1"	Advanced Low-E IG	PEL-N-257-00016-00001	4	4	argon	0.27	0.32	0.60	60						
	with grilles-between-the-glass	PEL-N-257-00016-00002				0.27	0.29	0.54	60						
	with applied grilles	PEL-N-257-00016-00005				0.27	0.26	0.48	60						
1"	Advanced Low-E IG	PEL-N-257-00018-00001	5	5	argon	0.27	0.31	0.60	60						
	with grilles-between-the-glass	PEL-N-257-00018-00002				0.27	0.29	0.54	60						
	with applied grilles	PEL-N-257-00018-00005				0.27	0.26	0.48	60						
1"	Advanced Low-E IG	PEL-N-257-00020-00001	6	6	argon	0.26	0.31	0.59	59						
	with grilles-between-the-glass	PEL-N-257-00020-00002				0.26	0.28	0.53	59						
	with applied grilles	PEL-N-257-00020-00005				0.26	0.26	0.47	59						
1"	SunDefense™ IG	PEL-N-257-00044-00001	3	3	argon	0.27	0.24	0.56	59						
	with grilles-between-the-glass	PEL-N-257-00044-00002				0.27	0.22	0.51	59			SC	S		
	with applied grilles	PEL-N-257-00044-00005				0.27	0.20	0.45	59			SC	S		
1"	SunDefense™ IG	PEL-N-257-00046-00001	4	4	argon	0.26	0.24	0.56	61						
	with grilles-between-the-glass	PEL-N-257-00046-00002				0.26	0.22	0.50	61			SC	S		
	with applied grilles	PEL-N-257-00046-00005				0.26	0.20	0.45	61			SC	S		
1"	SunDefense™ IG	PEL-N-257-00048-00001	5	5	argon	0.26	0.24	0.55	60						
	with grilles-between-the-glass	PEL-N-257-00048-00002				0.26	0.22	0.50	60			SC	S		
	with applied grilles	PEL-N-257-00048-00005				0.26	0.20	0.44	60			SC	S		
1"	SunDefense™ IG	PEL-N-257-00050-00001	6	6	argon	0.26	0.24	0.55	59						
	with grilles-between-the-glass	PEL-N-257-00050-00002				0.26	0.22	0.49	59			SC	S		
	with applied grilles	PEL-N-257-00050-00005				0.26	0.20	0.44	59			SC	S		
1"	SunDefense+ IG	PEL-N-257-02456-00001	3	3	argon	0.22	0.23	0.55	50	N	NC	SC	S		
	with grilles-between-the-glass	PEL-N-257-02457-00001				0.22	0.21	0.49	50	N	NC	SC	S		
	with applied grilles	PEL-N-257-02458-00001				0.22	0.19	0.44	50	N	NC	SC	S		
1"	SunDefense+ IG	PEL-N-257-02462-00001	4	4	argon	0.22	0.23	0.55	49	N	NC	SC	S		
	with grilles-between-the-glass	PEL-N-257-02463-00001				0.22	0.21	0.49	49	N	NC	SC	S		
	with applied grilles	PEL-N-257-02464-00001				0.22	0.19	0.44	49	N	NC	SC	S		
1"	SunDefense+ IG	PEL-N-257-02480-00001	5	5	argon	0.22	0.23	0.54	49	N	NC	SC	S		
	with grilles-between-the-glass	PEL-N-257-02481-00001				0.22	0.21	0.49	49	N	NC	SC	S		
	with applied grilles	PEL-N-257-02482-00001				0.22	0.19	0.43	49	N	NC	SC	S		
1"	SunDefense+ IG	PEL-N-257-02486-00001	6	6	argon	0.22	0.23	0.53	48	N	NC	SC	S		
	with grilles-between-the-glass	PEL-N-257-02487-00001				0.22	0.21	0.48	48	N	NC	SC	S		
	with applied grilles	PEL-N-257-02488-00001				0.22	0.19	0.43	48	N	NC	SC	S		

Continued on next page

R-Value = 1/U-Factor
SHGC = Solar Heat Gain Coefficient
VLT % = Visible Light Transmission
CR = Condensation Resistance
ER = Canadian Energy Rating

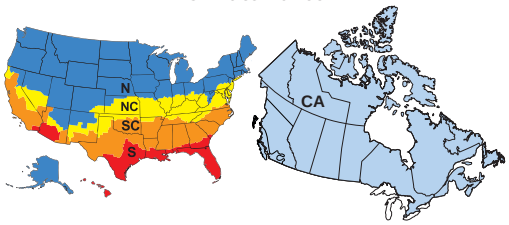
U.S. Glazing performance values are calculated based on NFRC 100, NFRC 200 and NFRC 500.
ENERGY STAR® values are updated to 2023 (version 7) criteria.

The Canadian values shown are based on the updated ENERGY STAR® 2020 initiative.

For center-glass values, see the Product Performance section.

Visit www.energystar.gov for Energy Star guidelines.

Climate Zones



Glazing Thickness	Type of Glazing	NFRC Certified Product #	Glass (mm)		Gap Fill	U-Factor	SHGC	VLT	CR	Shaded Areas Meet ENERGY STAR® Performance Criteria in Zones Shown					
			Ext.	Int.						U. S.				Canada	
										Zone				ER	Zone
Fixed										N	NC	SC	S		CA
1"	AdvancedComfort Low-E IG	PEL-N-257-00068-00001	3	3	argon	0.22	0.32	0.60	49	N	NC				
	with grilles-between-the-glass	PEL-N-257-00068-00002				0.22	0.29	0.54	49	N	NC				
	with applied grilles	PEL-N-257-00068-00005				0.22	0.26	0.48	49	N	NC				
1"	AdvancedComfort Low-E IG	PEL-N-257-00070-00001	4	4	argon	0.22	0.31	0.59	48	N	NC				
	with grilles-between-the-glass	PEL-N-257-00070-00002				0.22	0.28	0.53	48	N	NC				
	with applied grilles	PEL-N-257-00070-00005				0.22	0.25	0.47	48	N	NC				
1"	AdvancedComfort Low-E IG	PEL-N-257-00072-00001	5	5	argon	0.22	0.31	0.58	48	N	NC				
	with grilles-between-the-glass	PEL-N-257-00072-00002				0.22	0.28	0.52	48	N	NC				
	with applied grilles	PEL-N-257-00072-00005				0.22	0.25	0.47	48	N	NC				
1"	AdvancedComfort Low-E IG	PEL-N-257-00074-00001	6	6	argon	0.22	0.30	0.58	47	N	NC				
	with grilles-between-the-glass	PEL-N-257-00074-00002				0.22	0.28	0.52	47	N	NC				
	with applied grilles	PEL-N-257-00074-00005				0.22	0.25	0.46	47	N	NC				
1"	NaturalSun Low-E IG	PEL-N-257-00056-00001	3	3	argon	0.28	0.60	0.69	58					40	CA
	with grilles-between-the-glass	PEL-N-257-00056-00002				0.28	0.54	0.62	58					36	CA
	with applied grilles	PEL-N-257-00056-00005				0.28	0.49	0.55	58						
1"	NaturalSun Low-E IG	PEL-N-257-00058-00001	4	4	argon	0.28	0.59	0.69	60					39	CA
	with grilles-between-the-glass	PEL-N-257-00058-00002				0.28	0.53	0.61	60					36	CA
	with applied grilles	PEL-N-257-00058-00005				0.28	0.47	0.55	60						
1"	NaturalSun Low-E IG	PEL-N-257-00060-00001	5	5	argon	0.28	0.58	0.68	59					38	CA
	with grilles-between-the-glass	PEL-N-257-00060-00002				0.28	0.52	0.61	59					35	CA
	with applied grilles	PEL-N-257-00060-00005				0.28	0.47	0.54	59						
1"	NaturalSun Low-E IG	PEL-N-257-00062-00001	6	6	argon	0.27	0.56	0.67	59					39	CA
	with grilles-between-the-glass	PEL-N-257-00062-00002				0.27	0.51	0.60	59					36	CA
	with applied grilles	PEL-N-257-00062-00005				0.27	0.45	0.54	59						
1"	NaturalSun+ Low-E IG	PEL-N-257-02420-00001	3	3	argon	0.23	0.55	0.67	48	N				43	CA
	with grilles-between-the-glass	PEL-N-257-02421-00001				0.23	0.49	0.61	48	N				39	CA
	with applied grilles	PEL-N-257-02422-00001				0.23	0.44	0.54	48	N				37	CA
1"	NaturalSun+ Low-E IG	PEL-N-257-02426-00001	4	4	argon	0.23	0.53	0.67	48	N				42	CA
	with grilles-between-the-glass	PEL-N-257-02427-00001				0.23	0.48	0.60	48	N				39	CA
	with applied grilles	PEL-N-257-02428-00001				0.23	0.43	0.54	48	N				36	CA
1"	NaturalSun+ Low-E IG	PEL-N-257-02444-00001	5	5	argon	0.23	0.52	0.66	47	N				41	CA
	with grilles-between-the-glass	PEL-N-257-02445-00001				0.23	0.47	0.59	47	N				38	CA
	with applied grilles	PEL-N-257-02446-00001				0.23	0.43	0.53	47	N				36	CA
1"	NaturalSun+ Low-E IG	PEL-N-257-02450-00001	6	6	argon	0.23	0.51	0.65	47	N				41	CA
	with grilles-between-the-glass	PEL-N-257-02451-00001				0.23	0.46	0.59	47	N				38	CA
	with applied grilles	PEL-N-257-02452-00001				0.23	0.41	0.52	47	N				35	CA

R-Value = 1/U-Factor
SHGC = Solar Heat Gain Coefficient
VLT % = Visible Light Transmission
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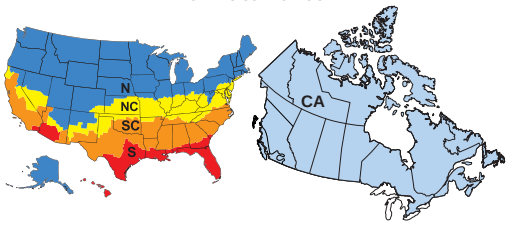
For center-glass values, see the Product Performance section.

Visit www.energystar.gov for Energy Star guidelines.

Climate Zones



Glazing Performance - Total Unit

Glazing Thickness	Type of Glazing	NFRC Certified Product #	Glass (mm)		Gap Fill	U-Factor	SHGC	VLT	CR	Shaded Areas Meet ENERGY STAR® Performance Criteria in Zones Shown					
			Ext.	Int.						U. S.				Canada	
										Zone				ER	Zone
Fixed — with Foam Insulation										N	NC	SC	S		CA
1"	Advanced Low-E IG	PEL-N-257-00206-00001	3	3	argon	0.27	0.32	0.61	59						
	with grilles-between-the-glass	PEL-N-257-00206-00002				0.27	0.29	0.55	59						
	with applied grilles	PEL-N-257-00206-00005				0.27	0.26	0.49	59						
1"	Advanced Low-E IG	PEL-N-257-00208-00001	4	4	argon	0.26	0.32	0.60	61						
	with grilles-between-the-glass	PEL-N-257-00208-00002				0.26	0.29	0.54	61						
	with applied grilles	PEL-N-257-00208-00005				0.26	0.26	0.48	61						
1"	Advanced Low-E IG	PEL-N-257-00210-00001	5	5	argon	0.26	0.31	0.60	60						
	with grilles-between-the-glass	PEL-N-257-00210-00002				0.26	0.29	0.54	60						
	with applied grilles	PEL-N-257-00210-00005				0.26	0.26	0.48	60						
1"	Advanced Low-E IG	PEL-N-257-00212-00001	6	6	argon	0.26	0.31	0.59	59						
	with grilles-between-the-glass	PEL-N-257-00212-00002				0.26	0.28	0.53	59						
	with applied grilles	PEL-N-257-00212-00005				0.26	0.26	0.47	59						
1"	SunDefense IG	PEL-N-257-00236-00001	3	3	argon	0.26	0.24	0.56	59						
	with grilles-between-the-glass	PEL-N-257-00236-00002				0.26	0.22	0.51	59			SC	S		
	with applied grilles	PEL-N-257-00236-00005				0.26	0.20	0.45	59			SC	S		
1"	SunDefense IG	PEL-N-257-00238-00001	4	4	argon	0.26	0.24	0.56	61						
	with grilles-between-the-glass	PEL-N-257-00238-00002				0.26	0.22	0.50	61			SC	S		
	with applied grilles	PEL-N-257-00238-00005				0.26	0.20	0.45	61			SC	S		
1"	SunDefense IG	PEL-N-257-00240-00001	5	5	argon	0.25	0.24	0.55	60		NC				
	with grilles-between-the-glass	PEL-N-257-00240-00002				0.25	0.22	0.50	60		NC	SC	S		
	with applied grilles	PEL-N-257-00240-00005				0.25	0.20	0.44	60		NC	SC	S		
1"	SunDefense IG	PEL-N-257-00242-00001	6	6	argon	0.25	0.24	0.55	60		NC				
	with grilles-between-the-glass	PEL-N-257-00242-00002				0.25	0.22	0.49	60		NC	SC	S		
	with applied grilles	PEL-N-257-00242-00005				0.25	0.20	0.44	60		NC	SC	S		
1"	SunDefense+ IG	PEL-N-257-02564-00001	3	3	argon	0.21	0.23	0.55	50	N	NC	SC	S	27	CA
	with grilles-between-the-glass	PEL-N-257-02565-00001				0.21	0.21	0.49	50	N	NC	SC	S	26	CA
	with applied grilles	PEL-N-257-02566-00001				0.21	0.19	0.44	50	N	NC	SC	S	25	CA
1"	SunDefense+ IG	PEL-N-257-02570-00001	4	4	argon	0.21	0.23	0.55	50	N	NC	SC	S	27	CA
	with grilles-between-the-glass	PEL-N-257-02571-00001				0.21	0.21	0.49	50	N	NC	SC	S	26	CA
	with applied grilles	PEL-N-257-02572-00001				0.21	0.19	0.44	50	N	NC	SC	S	25	CA
1"	SunDefense+ IG	PEL-N-257-02588-00001	5	5	argon	0.21	0.23	0.54	49	N	NC	SC	S	27	CA
	with grilles-between-the-glass	PEL-N-257-02589-00001				0.21	0.21	0.49	49	N	NC	SC	S	26	CA
	with applied grilles	PEL-N-257-02590-00001				0.21	0.19	0.43	49	N	NC	SC	S	25	CA
1"	SunDefense+ IG	PEL-N-257-02594-00001	6	6	argon	0.21	0.23	0.53	48	N	NC	SC	S	27	CA
	with grilles-between-the-glass	PEL-N-257-02595-00001				0.21	0.21	0.48	48	N	NC	SC	S	26	CA
	with applied grilles	PEL-N-257-02596-00001				0.21	0.19	0.43	48	N	NC	SC	S	25	CA
1"	AdvancedComfort Low-E IG	PEL-N-257-00260-00001	3	3	argon	0.22	0.32	0.60	49	N	NC				
	with grilles-between-the-glass	PEL-N-257-00260-00002				0.22	0.29	0.54	49	N	NC				
	with applied grilles	PEL-N-257-00260-00005				0.22	0.26	0.48	49	N	NC				
1"	AdvancedComfort Low-E IG	PEL-N-257-00262-00001	4	4	argon	0.22	0.31	0.59	49	N	NC				
	with grilles-between-the-glass	PEL-N-257-00262-00002				0.22	0.28	0.53	49	N	NC				
	with applied grilles	PEL-N-257-00262-00005				0.22	0.25	0.47	49	N	NC				
1"	AdvancedComfort Low-E IG	PEL-N-257-00264-00001	5	5	argon	0.21	0.31	0.58	48	N	NC			32	CA
	with grilles-between-the-glass	PEL-N-257-00264-00002				0.21	0.28	0.52	48	N	NC			30	CA
	with applied grilles	PEL-N-257-00264-00005				0.21	0.25	0.47	48	N	NC			28	CA
1"	AdvancedComfort Low-E IG	PEL-N-257-00266-00001	6	6	argon	0.21	0.30	0.58	47	N	NC			31	CA
	with grilles-between-the-glass	PEL-N-257-00266-00002				0.21	0.28	0.52	47	N	NC			30	CA
	with applied grilles	PEL-N-257-00266-00005				0.21	0.25	0.46	47	N	NC			28	CA

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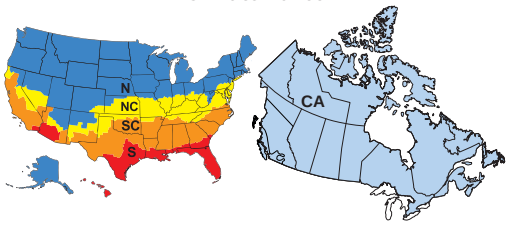
Climate Zones



Glazing Thickness	Type of Glazing	NFRC Certified Product #	Glass (mm)		Gap Fill	U-Factor	SHGC	VLT	CR	Shaded Areas Meet ENERGY STAR® Performance Criteria in Zones Shown					
			Ext.	Int.						U. S.				Canada	
										Zone				ER	Zone
Fixed — with Foam Insulation										N	NC	SC	S		CA
1"	NaturalSun Low-E IG	PEL-N-257-00248-00001	3	3	argon	0.28	0.60	0.69	58					40	CA
	with grilles-between-the-glass	PEL-N-257-00248-00002				0.28	0.54	0.62	58					36	CA
	with applied grilles	PEL-N-257-00248-00005				0.28	0.49	0.55	58						
1"	NaturalSun Low-E IG	PEL-N-257-00250-00001	4	4	argon	0.27	0.59	0.69	60					40	CA
	with grilles-between-the-glass	PEL-N-257-00250-00002				0.27	0.53	0.61	60					37	CA
	with applied grilles	PEL-N-257-00250-00005				0.27	0.47	0.55	60						
1"	NaturalSun Low-E IG	PEL-N-257-00252-00001	5	5	argon	0.27	0.58	0.68	59					40	CA
	with grilles-between-the-glass	PEL-N-257-00252-00002				0.27	0.52	0.61	59					36	CA
	with applied grilles	PEL-N-257-00252-00005				0.27	0.47	0.54	59						
1"	NaturalSun Low-E IG	PEL-N-257-00254-00001	6	6	argon	0.27	0.56	0.67	59					39	CA
	with grilles-between-the-glass	PEL-N-257-00254-00002				0.27	0.51	0.60	59					36	CA
	with applied grilles	PEL-N-257-00254-00005				0.27	0.45	0.54	59						
1"	NaturalSun+ Low-E IG	PEL-N-257-02528-00001	3	3	argon	0.23	0.55	0.67	49	N				43	CA
	with grilles-between-the-glass	PEL-N-257-02529-00001				0.23	0.49	0.61	49	N				39	CA
	with applied grilles	PEL-N-257-02530-00001				0.23	0.44	0.54	49	N				37	CA
1"	NaturalSun+ Low-E IG	PEL-N-257-02534-00001	4	4	argon	0.22	0.53	0.67	48	N				43	CA
	with grilles-between-the-glass	PEL-N-257-02535-00001				0.22	0.48	0.60	48	N				40	CA
	with applied grilles	PEL-N-257-02536-00001				0.22	0.43	0.54	48	N				37	CA
1"	NaturalSun+ Low-E IG	PEL-N-257-02552-00001	5	5	argon	0.22	0.52	0.66	48	N				42	CA
	with grilles-between-the-glass	PEL-N-257-02553-00001				0.22	0.47	0.59	48	N				40	CA
	with applied grilles	PEL-N-257-02554-00001				0.22	0.43	0.53	48	N				37	CA
1"	NaturalSun+ Low-E IG	PEL-N-257-02558-00001	6	6	argon	0.22	0.51	0.65	47	N				42	CA
	with grilles-between-the-glass	PEL-N-257-02559-00001				0.22	0.46	0.59	47	N				39	CA
	with applied grilles	PEL-N-257-02560-00001				0.22	0.41	0.52	47	N				36	CA

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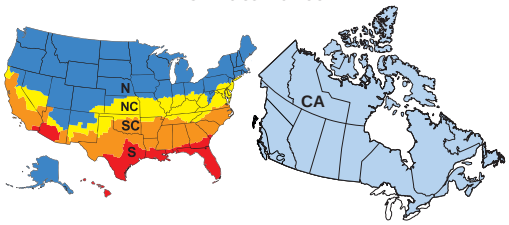
Climate Zones



Glazing Performance - Total Unit

Glazing Thickness	Type of Glazing	NFRC Certified Product #	Glass (mm)		Gap Fill	U-Factor	SHGC	VLT	CR	Shaded Areas Meet ENERGY STAR® Performance Criteria in Zones Shown					
			Ext.	Int.						U. S.				Canada	
										Zone				ER	Zone
Fixed — with High Altitude Glazing										N	NC	SC	S		CA
1"	(HA) Advanced Low-E IG	PEL-N-257-00013-00001	3	3	air	0.31	0.32	0.61	57						
	with grilles-between-the-glass	PEL-N-257-00013-00002				0.31	0.29	0.55	57						
	with applied grilles	PEL-N-257-00013-00005				0.31	0.27	0.49	57						
1"	(HA) Advanced Low-E IG	PEL-N-257-00015-00001	4	4	air	0.31	0.32	0.60	57						
	with grilles-between-the-glass	PEL-N-257-00015-00002				0.31	0.29	0.54	57						
	with applied grilles	PEL-N-257-00015-00005				0.31	0.26	0.48	57						
1"	(HA) Advanced Low-E IG	PEL-N-257-00017-00001	5	5	air	0.30	0.32	0.60	56						
	with grilles-between-the-glass	PEL-N-257-00017-00002				0.30	0.29	0.54	56						
	with applied grilles	PEL-N-257-00017-00005				0.30	0.26	0.48	56						
1"	(HA) Advanced Low-E IG	PEL-N-257-00019-00001	6	6	air	0.30	0.32	0.59	56						
	with grilles-between-the-glass	PEL-N-257-00019-00002				0.30	0.29	0.53	56						
	with applied grilles	PEL-N-257-00019-00005				0.30	0.26	0.47	56						
1"	(HA) SunDefense IG	PEL-N-257-00043-00001	3	3	air	0.31	0.24	0.56	57						
	with grilles-between-the-glass	PEL-N-257-00043-00002				0.31	0.22	0.51	57				S		
	with applied grilles	PEL-N-257-00043-00005				0.31	0.20	0.45	57				S		
1"	(HA) SunDefense IG	PEL-N-257-00045-00001	4	4	air	0.30	0.24	0.56	57						
	with grilles-between-the-glass	PEL-N-257-00045-00002				0.30	0.22	0.50	57				S		
	with applied grilles	PEL-N-257-00045-00005				0.30	0.20	0.45	57				S		
1"	(HA) SunDefense IG	PEL-N-257-00047-00001	5	5	air	0.30	0.24	0.55	56						
	with grilles-between-the-glass	PEL-N-257-00047-00002				0.30	0.22	0.50	56				S		
	with applied grilles	PEL-N-257-00047-00005				0.30	0.20	0.44	56				S		
1"	(HA) SunDefense IG	PEL-N-257-00049-00001	6	6	air	0.30	0.24	0.55	56						
	with grilles-between-the-glass	PEL-N-257-00049-00002				0.30	0.22	0.49	56				S		
	with applied grilles	PEL-N-257-00049-00005				0.30	0.20	0.44	56				S		
1"	(HA) SunDefense+ IG	PEL-N-257-02453-00001	3	3	air	0.25	0.23	0.55	46		NC	SC	S		
	with grilles-between-the-glass	PEL-N-257-02454-00001				0.25	0.21	0.49	46		NC	SC	S		
	with applied grilles	PEL-N-257-02455-00001				0.25	0.19	0.44	46		NC	SC	S		
1"	(HA) SunDefense+ IG	PEL-N-257-02459-00001	4	4	air	0.25	0.23	0.55	46		NC	SC	S		
	with grilles-between-the-glass	PEL-N-257-02460-00001				0.25	0.21	0.49	46		NC	SC	S		
	with applied grilles	PEL-N-257-02461-00001				0.25	0.19	0.44	46		NC	SC	S		
1"	(HA) SunDefense+ IG	PEL-N-257-02477-00001	5	5	air	0.24	0.23	0.54	45		NC	SC	S		
	with grilles-between-the-glass	PEL-N-257-02478-00001				0.24	0.21	0.49	45		NC	SC	S		
	with applied grilles	PEL-N-257-02479-00001				0.24	0.19	0.43	45		NC	SC	S		
1"	(HA) SunDefense+ IG	PEL-N-257-02483-00001	6	6	air	0.24	0.23	0.53	45		NC	SC	S		
	with grilles-between-the-glass	PEL-N-257-02484-00001				0.24	0.21	0.48	45		NC	SC	S		
	with applied grilles	PEL-N-257-02485-00001				0.24	0.19	0.43	45		NC	SC	S		
1"	(HA) AdvancedComfort Low-E IG	PEL-N-257-00067-00001	3	3	air	0.25	0.32	0.60	45		NC				
	with grilles-between-the-glass	PEL-N-257-00067-00002				0.25	0.29	0.54	45		NC				
	with applied grilles	PEL-N-257-00067-00005				0.25	0.26	0.48	45		NC				
1"	(HA) AdvancedComfort Low-E IG	PEL-N-257-00069-00001	4	4	air	0.25	0.31	0.59	45		NC				
	with grilles-between-the-glass	PEL-N-257-00069-00002				0.25	0.28	0.53	45		NC				
	with applied grilles	PEL-N-257-00069-00005				0.25	0.25	0.47	45		NC				
1"	(HA) AdvancedComfort Low-E IG	PEL-N-257-00071-00001	5	5	air	0.24	0.31	0.58	44		NC				
	with grilles-between-the-glass	PEL-N-257-00071-00002				0.24	0.28	0.52	44		NC				
	with applied grilles	PEL-N-257-00071-00005				0.24	0.25	0.47	44		NC				
1"	(HA) AdvancedComfort Low-E IG	PEL-N-257-00073-00001	6	6	air	0.24	0.31	0.58	44		NC				
	with grilles-between-the-glass	PEL-N-257-00073-00002				0.24	0.28	0.52	44		NC				
	with applied grilles	PEL-N-257-00073-00005				0.24	0.25	0.46	44		NC				

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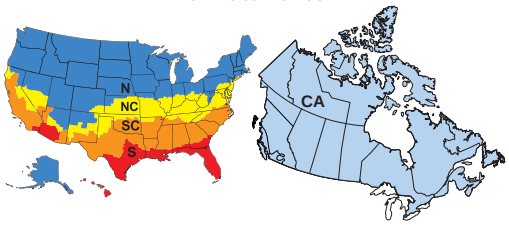
Climate Zones



Glazing Thickness	Type of Glazing	NFRC Certified Product #	Glass (mm)		Gap Fill	U-Factor	SHGC	VLT	CR	Shaded Areas Meet ENERGY STAR® Performance Criteria in Zones Shown					
										U. S.				Canada	
			Ext.	Int.						Zone				ER	Zone
Fixed — with High Altitude Glazing										N	NC	SC	S		CA
1"	(HA) NaturalSun Low-E IG	PEL-N-257-00055-00001	3	3	air	0.32	0.60	0.69	57					35	CA
	with grilles-between-the-glass	PEL-N-257-00055-00002				0.32	0.54	0.62	57						
	with applied grilles	PEL-N-257-00055-00005				0.32	0.49	0.55	57						
1"	(HA) NaturalSun Low-E IG	PEL-N-257-00057-00001	4	4	air	0.32	0.58	0.69	56						
	with grilles-between-the-glass	PEL-N-257-00057-00002				0.32	0.53	0.61	56						
	with applied grilles	PEL-N-257-00057-00005				0.32	0.47	0.55	56						
1"	(HA) NaturalSun Low-E IG	PEL-N-257-00059-00001	5	5	air	0.31	0.58	0.68	56					35	CA
	with grilles-between-the-glass	PEL-N-257-00059-00002				0.31	0.52	0.61	56						
	with applied grilles	PEL-N-257-00059-00005				0.31	0.47	0.54	56						
1"	(HA) NaturalSun Low-E IG	PEL-N-257-00061-00001	6	6	air	0.31	0.56	0.67	55					34	CA
	with grilles-between-the-glass	PEL-N-257-00061-00002				0.31	0.50	0.60	55						
	with applied grilles	PEL-N-257-00061-00005				0.31	0.45	0.54	55						
1"	(HA) NaturalSun+ Low-E IG	PEL-N-257-02417-00001	3	3	air	0.26	0.55	0.67	39	N				39	CA
	with grilles-between-the-glass	PEL-N-257-02418-00001				0.26	0.49	0.61	39	N				36	CA
	with applied grilles	PEL-N-257-02419-00001				0.26	0.44	0.54	39	N					
1"	(HA) NaturalSun+ Low-E IG	PEL-N-257-02423-00001	4	4	air	0.25	0.53	0.67	45	N				39	CA
	with grilles-between-the-glass	PEL-N-257-02424-00001				0.25	0.48	0.60	45	N				36	CA
	with applied grilles	PEL-N-257-02425-00001				0.25	0.43	0.54	45	N				34	CA
1"	(HA) NaturalSun+ Low-E IG	PEL-N-257-02441-00001	5	5	air	0.25	0.52	0.66	44	N				39	CA
	with grilles-between-the-glass	PEL-N-257-02442-00001				0.25	0.47	0.59	44	N				36	CA
	with applied grilles	PEL-N-257-02443-00001				0.25	0.42	0.53	44	N					
1"	(HA) NaturalSun+ Low-E IG	PEL-N-257-02447-00001	6	6	air	0.25	0.50	0.65	44	N				38	CA
	with grilles-between-the-glass	PEL-N-257-02448-00001				0.25	0.46	0.59	44	N				35	CA
	with applied grilles	PEL-N-257-02449-00001				0.25	0.41	0.52	44	N					

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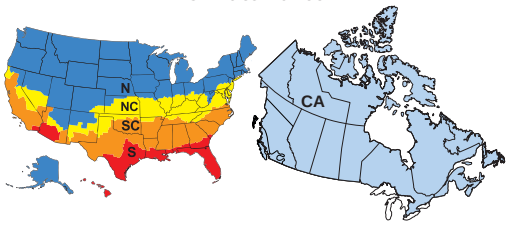

Glazing Performance - Total Unit

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			Ext.	Int.						U. S.				Canada	
										Zone				ER	Zone
Fixed — with High Altitude Glazing and Foam Insulation										N	NC	SC	S		CA
1"	(HA) Advanced Low-E IG	PEL-N-257-00205-00001	3	3	air	0.31	0.32	0.61	57						
	with grilles-between-the-glass	PEL-N-257-00205-00002				0.31	0.29	0.55	57						
	with applied grilles	PEL-N-257-00205-00005				0.31	0.27	0.49	57						
1"	(HA) Advanced Low-E IG	PEL-N-257-00207-00001	4	4	air	0.30	0.32	0.60	57						
	with grilles-between-the-glass	PEL-N-257-00207-00002				0.30	0.29	0.54	57						
	with applied grilles	PEL-N-257-00207-00005				0.30	0.26	0.48	57						
1"	(HA) Advanced Low-E IG	PEL-N-257-00209-00001	5	5	air	0.30	0.32	0.60	56						
	with grilles-between-the-glass	PEL-N-257-00209-00002				0.30	0.29	0.54	56						
	with applied grilles	PEL-N-257-00209-00005				0.30	0.26	0.48	56						
1"	(HA) Advanced Low-E IG	PEL-N-257-00211-00001	6	6	air	0.30	0.32	0.59	56						
	with grilles-between-the-glass	PEL-N-257-00211-00002				0.30	0.29	0.53	56						
	with applied grilles	PEL-N-257-00211-00005				0.30	0.26	0.47	56						
1"	(HA) SunDefense IG	PEL-N-257-00235-00001	3	3	air	0.30	0.24	0.56	58						
	with grilles-between-the-glass	PEL-N-257-00235-00002				0.30	0.22	0.51	58				S		
	with applied grilles	PEL-N-257-00235-00005				0.30	0.20	0.45	58				S		
1"	(HA) SunDefense IG	PEL-N-257-00237-00001	4	4	air	0.30	0.24	0.56	57						
	with grilles-between-the-glass	PEL-N-257-00237-00002				0.30	0.22	0.50	57				S		
	with applied grilles	PEL-N-257-00237-00005				0.30	0.20	0.45	57				S		
1"	(HA) SunDefense IG	PEL-N-257-00239-00001	5	5	air	0.29	0.24	0.55	57						
	with grilles-between-the-glass	PEL-N-257-00239-00002				0.29	0.22	0.50	57				S		
	with applied grilles	PEL-N-257-00239-00005				0.29	0.20	0.44	57				S		
1"	(HA) SunDefense IG	PEL-N-257-00241-00001	6	6	air	0.29	0.24	0.55	56						
	with grilles-between-the-glass	PEL-N-257-00241-00002				0.29	0.22	0.49	56				S		
	with applied grilles	PEL-N-257-00241-00005				0.29	0.20	0.44	56				S		
1"	(HA) SunDefense+ IG	PEL-N-257-02561-00001	3	3	air	0.24	0.23	0.55	47		NC	SC	S		
	with grilles-between-the-glass	PEL-N-257-02562-00001				0.24	0.21	0.49	47		NC	SC	S		
	with applied grilles	PEL-N-257-02563-00001				0.24	0.19	0.44	47		NC	SC	S		
1"	(HA) SunDefense+ IG	PEL-N-257-02567-00001	4	4	air	0.24	0.23	0.55	46		NC	SC	S		
	with grilles-between-the-glass	PEL-N-257-02568-00001				0.24	0.21	0.49	46		NC	SC	S		
	with applied grilles	PEL-N-257-02569-00001				0.24	0.19	0.44	46		NC	SC	S		
1"	(HA) SunDefense+ IG	PEL-N-257-02585-00001	5	5	air	0.24	0.23	0.54	45		NC	SC	S		
	with grilles-between-the-glass	PEL-N-257-02586-00001				0.24	0.21	0.49	45		NC	SC	S		
	with applied grilles	PEL-N-257-02587-00001				0.24	0.19	0.43	45		NC	SC	S		
1"	(HA) SunDefense+ IG	PEL-N-257-02591-00001	6	6	air	0.24	0.23	0.53	45		NC	SC	S		
	with grilles-between-the-glass	PEL-N-257-02592-00001				0.24	0.21	0.48	45		NC	SC	S		
	with applied grilles	PEL-N-257-02593-00001				0.24	0.19	0.43	45		NC	SC	S		
1"	(HA) AdvancedComfort Low-E IG	PEL-N-257-00259-00001	3	3	air	0.24	0.32	0.60	46		NC				
	with grilles-between-the-glass	PEL-N-257-00259-00002				0.24	0.29	0.54	46		NC				
	with applied grilles	PEL-N-257-00259-00005				0.24	0.26	0.48	46		NC				
1"	(HA) AdvancedComfort Low-E IG	PEL-N-257-00261-00001	4	4	air	0.24	0.31	0.59	45		NC				
	with grilles-between-the-glass	PEL-N-257-00261-00002				0.24	0.28	0.53	45		NC				
	with applied grilles	PEL-N-257-00261-00005				0.24	0.25	0.47	45		NC				
1"	(HA) AdvancedComfort Low-E IG	PEL-N-257-00263-00001	5	5	air	0.24	0.31	0.58	45		NC				
	with grilles-between-the-glass	PEL-N-257-00263-00002				0.24	0.28	0.52	45		NC				
	with applied grilles	PEL-N-257-00263-00005				0.24	0.25	0.47	45		NC				
1"	(HA) AdvancedComfort Low-E IG	PEL-N-257-00265-00001	6	6	air	0.24	0.31	0.58	44		NC				
	with grilles-between-the-glass	PEL-N-257-00265-00002				0.24	0.28	0.52	44		NC				
	with applied grilles	PEL-N-257-00265-00005				0.24	0.25	0.46	44		NC				

Continued on next page

R-Value = 1/U-Factor
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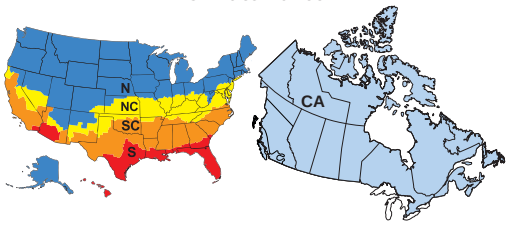
Climate Zones



Glazing Thickness	Type of Glazing	NFRC Certified Product #	Glass (mm)		Gap Fill	U-Factor	SHGC	VLT	CR	Shaded Areas Meet ENERGY STAR® Performance Criteria in Zones Shown					
										U. S.				Canada	
			Ext.	Int.						Zone				ER	Zone
Fixed — with High Altitude Glazing and Foam Insulation										N	NC	SC	S		CA
1"	(HA) NaturalSun Low-E IG	PEL-N-257-00247-00001	3	3	air	0.31	0.60	0.69	57					36	CA
	with grilles-between-the-glass	PEL-N-257-00247-00002				0.31	0.54	0.62	57						
	with applied grilles	PEL-N-257-00247-00005				0.31	0.49	0.55	57						
1"	(HA) NaturalSun Low-E IG	PEL-N-257-00249-00001	4	4	air	0.31	0.58	0.69	56					35	CA
	with grilles-between-the-glass	PEL-N-257-00249-00002				0.31	0.53	0.61	56						
	with applied grilles	PEL-N-257-00249-00005				0.31	0.47	0.55	56						
1"	(HA) NaturalSun Low-E IG	PEL-N-257-00251-00001	5	5	air	0.31	0.58	0.68	56					35	CA
	with grilles-between-the-glass	PEL-N-257-00251-00002				0.31	0.52	0.61	56						
	with applied grilles	PEL-N-257-00251-00005				0.31	0.47	0.54	56						
1"	(HA) NaturalSun Low-E IG	PEL-N-257-00253-00001	6	6	air	0.30	0.56	0.67	55					35	CA
	with grilles-between-the-glass	PEL-N-257-00253-00002				0.30	0.50	0.60	55						
	with applied grilles	PEL-N-257-00253-00005				0.30	0.45	0.54	55						
1"	(HA) NaturalSun+ Low-E IG	PEL-N-257-02525-00001	3	3	air	0.25	0.55	0.67	39	N				40	CA
	with grilles-between-the-glass	PEL-N-257-02526-00001				0.25	0.49	0.61	39	N				37	CA
	with applied grilles	PEL-N-257-02527-00001				0.25	0.44	0.54	39	N				34	CA
1"	(HA) NaturalSun+ Low-E IG	PEL-N-257-02531-00001	4	4	air	0.25	0.53	0.67	45	N				39	CA
	with grilles-between-the-glass	PEL-N-257-02532-00001				0.25	0.48	0.60	45	N				36	CA
	with applied grilles	PEL-N-257-02533-00001				0.25	0.43	0.54	45	N				34	CA
1"	(HA) NaturalSun+ Low-E IG	PEL-N-257-02549-00001	5	5	air	0.25	0.52	0.66	44	N				39	CA
	with grilles-between-the-glass	PEL-N-257-02550-00001				0.25	0.47	0.59	44	N				36	CA
	with applied grilles	PEL-N-257-02551-00001				0.25	0.42	0.53	44	N					
1"	(HA) NaturalSun+ Low-E IG	PEL-N-257-02555-00001	6	6	air	0.25	0.50	0.65	44	N				38	CA
	with grilles-between-the-glass	PEL-N-257-02556-00001				0.25	0.46	0.59	44	N				35	CA
	with applied grilles	PEL-N-257-02557-00001				0.25	0.41	0.52	44	N					

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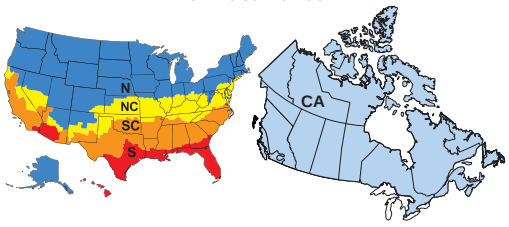
Climate Zones



Glazing Performance - Total Unit

Glazing Thickness	Type of Glazing	NFRC Certified Product #	Glass (mm)		Gap Fill	U-Factor	SHGC	VLT	CR	Shaded Areas Meet ENERGY STAR® Performance Criteria in Zones Shown					
										U. S.				Canada	
			Ext.	Int.						Zone				ER	Zone
Fixed — 5mm/3mm Glazing										N	NC	SC	S		CA
1"	Clear IG	PEL-N-257-00009-00001	5	3	air	0.45	0.66	0.71	45						
	with grilles-between-the-glass	PEL-N-257-00009-00002				0.45	0.59	0.64	45						
	with applied grilles	PEL-N-257-00009-00005				0.45	0.53	0.57	45						
1"	Advanced Low-E IG	PEL-N-257-00034-00001	5	3	argon	0.27	0.32	0.60	61						
	with grilles-between-the-glass	PEL-N-257-00034-00002				0.27	0.29	0.54	61						
	with applied grilles	PEL-N-257-00034-00005				0.27	0.26	0.48	61						
1"	SunDefense™ IG	PEL-N-257-00052-00001	5	3	argon	0.26	0.24	0.56	61						
	with grilles-between-the-glass	PEL-N-257-00052-00002				0.26	0.22	0.50	61			SC	S		
	with applied grilles	PEL-N-257-00052-00005				0.26	0.20	0.45	61			SC	S		
1"	SunDefense+ IG	PEL-N-257-02474-00001	5	3	argon	0.22	0.23	0.55	50	N	NC	SC	S		
	with grilles-between-the-glass	PEL-N-257-02475-00001				0.22	0.21	0.49	50	N	NC	SC	S		
	with applied grilles	PEL-N-257-02476-00001				0.22	0.19	0.44	50	N	NC	SC	S		
1"	AdvancedComfort Low-E IG	PEL-N-257-00076-00001	5	3	argon	0.22	0.31	0.59	49	N	NC				
	with grilles-between-the-glass	PEL-N-257-00076-00002				0.22	0.28	0.53	49	N	NC				
	with applied grilles	PEL-N-257-00076-00005				0.22	0.25	0.47	49	N	NC				
1"	NaturalSun Low-E IG	PEL-N-257-00064-00001	5	3	argon	0.28	0.58	0.68	60					38	CA
	with grilles-between-the-glass	PEL-N-257-00064-00002				0.28	0.52	0.61	60					35	CA
	with applied grilles	PEL-N-257-00064-00005				0.28	0.47	0.55	60						
1"	NaturalSun+ Low-E IG	PEL-N-257-02438-00001	5	3	argon	0.23	0.53	0.67	48	N				42	CA
	with grilles-between-the-glass	PEL-N-257-02439-00001				0.23	0.48	0.60	48	N				39	CA
	with applied grilles	PEL-N-257-02440-00001				0.23	0.43	0.53	48	N				36	CA
Fixed — 5mm/3mm with Foam Insulation															
1"	Advanced Low-E IG	PEL-N-257-00226-00001	5	3	argon	0.26	0.32	0.60	61						
	with grilles-between-the-glass	PEL-N-257-00226-00002				0.26	0.29	0.54	61						
	with applied grilles	PEL-N-257-00226-00005				0.26	0.26	0.48	61						
1"	SunDefense™ IG	PEL-N-257-00244-00001	5	3	argon	0.26	0.24	0.56	61						
	with grilles-between-the-glass	PEL-N-257-00244-00002				0.26	0.22	0.50	61			SC	S		
	with applied grilles	PEL-N-257-00244-00005				0.26	0.20	0.45	61			SC	S		
1"	SunDefense+ IG	PEL-N-257-02582-00001	5	3	argon	0.21	0.23	0.55	50	N	NC	SC	S	27	CA
	with grilles-between-the-glass	PEL-N-257-02583-00001				0.21	0.21	0.49	50	N	NC	SC	S	26	CA
	with applied grilles	PEL-N-257-02584-00001				0.21	0.19	0.44	50	N	NC	SC	S	25	CA
1"	AdvancedComfort Low-E IG	PEL-N-257-00268-00001	5	3	argon	0.22	0.31	0.59	49	N	NC				
	with grilles-between-the-glass	PEL-N-257-00268-00002				0.22	0.28	0.53	49	N	NC				
	with applied grilles	PEL-N-257-00268-00005				0.22	0.25	0.47	49	N	NC				
1"	NaturalSun Low-E IG	PEL-N-257-00256-00001	5	3	argon	0.27	0.58	0.68	61					40	CA
	with grilles-between-the-glass	PEL-N-257-00256-00002				0.27	0.52	0.61	61					36	CA
	with applied grilles	PEL-N-257-00256-00005				0.27	0.47	0.55	61						
1"	NaturalSun+ Low-E IG	PEL-N-257-02546-00001	5	3	argon	0.22	0.53	0.67	48	N				43	CA
	with grilles-between-the-glass	PEL-N-257-02547-00001				0.22	0.48	0.60	48	N				40	CA
	with applied grilles	PEL-N-257-02548-00001				0.22	0.43	0.53	48	N				37	CA

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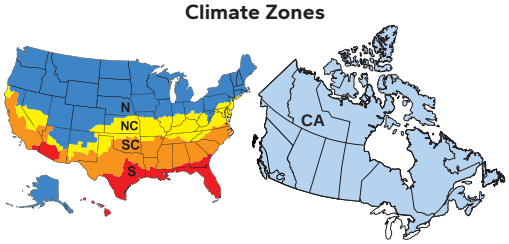
Climate Zones



Glazing Performance - Total Unit

Glazing Thickness	Type of Glazing	NFRC Certified Product #	Glass (mm)		Gap Fill	U-Factor	SHGC	VLT	CR	Shaded Areas Meet ENERGY STAR® Performance Criteria in Zones Shown					
			Ext.	Int.						U. S.				Canada	
										Zone				ER	Zone
Fixed — 5mm/3mm with High Altitude Glazing										N	NC	SC	S		CA
1"	(HA) Advanced Low-E IG	PEL-N-257-00033-00001	5	3	air	0.31	0.32	0.60	57						
	with grilles-between-the-glass	PEL-N-257-00033-00002				0.31	0.29	0.54	57						
	with applied grilles	PEL-N-257-00033-00005				0.31	0.26	0.48	57						
1"	(HA) SunDefense IG	PEL-N-257-00051-00001	5	3	air	0.30	0.24	0.56	57						
	with grilles-between-the-glass	PEL-N-257-00051-00002				0.30	0.22	0.50	57				S		
	with applied grilles	PEL-N-257-00051-00005				0.30	0.20	0.45	57				S		
1"	(HA) SunDefense+ IG	PEL-N-257-02471-00001	5	3	air	0.25	0.23	0.55	46		NC	SC	S		
	with grilles-between-the-glass	PEL-N-257-02472-00001				0.25	0.21	0.49	46		NC	SC	S		
	with applied grilles	PEL-N-257-02473-00001				0.25	0.19	0.44	46		NC	SC	S		
1"	(HA) AdvancedComfort Low-E IG	PEL-N-257-00075-00001	5	3	air	0.25	0.31	0.59	45		NC				
	with grilles-between-the-glass	PEL-N-257-00075-00002				0.25	0.28	0.53	45		NC				
	with applied grilles	PEL-N-257-00075-00005				0.25	0.25	0.47	45		NC				
1"	(HA) NaturalSun Low-E IG	PEL-N-257-00063-00001	5	3	air	0.32	0.58	0.68	57						
	with grilles-between-the-glass	PEL-N-257-00063-00002				0.32	0.52	0.61	57						
	with applied grilles	PEL-N-257-00063-00005				0.32	0.47	0.55	57						
1"	(HA) NaturalSun+ Low-E IG	PEL-N-257-02435-00001	5	3	air	0.26	0.53	0.67	45	N				38	CA
	with grilles-between-the-glass	PEL-N-257-02436-00001				0.26	0.47	0.60	45	N				35	CA
	with applied grilles	PEL-N-257-02437-00001				0.26	0.43	0.53	45	N					
Fixed — 5mm/3mm with High Altitude Glazing and Foam Insulation															
1"	(HA) Advanced Low-E IG	PEL-N-257-00225-00001	5	3	air	0.30	0.32	0.60	57						
	with grilles-between-the-glass	PEL-N-257-00225-00002				0.30	0.29	0.54	57						
	with applied grilles	PEL-N-257-00225-00005				0.30	0.26	0.48	57						
1"	(HA) SunDefense IG	PEL-N-257-00243-00001	5	3	air	0.30	0.24	0.56	58						
	with grilles-between-the-glass	PEL-N-257-00243-00002				0.30	0.22	0.50	58				S		
	with applied grilles	PEL-N-257-00243-00005				0.30	0.20	0.45	58				S		
1"	(HA) SunDefense+ IG	PEL-N-257-02579-00001	5	3	air	0.24	0.23	0.55	46		NC	SC	S		
	with grilles-between-the-glass	PEL-N-257-02580-00001				0.24	0.21	0.49	46		NC	SC	S		
	with applied grilles	PEL-N-257-02581-00001				0.24	0.19	0.44	46		NC	SC	S		
1"	(HA) AdvancedComfort Low-E IG	PEL-N-257-00267-00001	5	3	air	0.24	0.31	0.59	45		NC				
	with grilles-between-the-glass	PEL-N-257-00267-00002				0.24	0.28	0.53	45		NC				
	with applied grilles	PEL-N-257-00267-00005				0.24	0.25	0.47	45		NC				
1"	(HA) NaturalSun Low-E IG	PEL-N-257-00255-00001	5	3	air	0.31	0.58	0.68	57					35	CA
	with grilles-between-the-glass	PEL-N-257-00255-00002				0.31	0.52	0.61	57						
	with applied grilles	PEL-N-257-00255-00005				0.31	0.47	0.55	57						
1"	(HA) NaturalSun+ Low-E IG	PEL-N-257-02543-00001	5	3	air	0.25	0.53	0.67	45	N				39	CA
	with grilles-between-the-glass	PEL-N-257-02544-00001				0.25	0.47	0.60	45	N				36	CA
	with applied grilles	PEL-N-257-02545-00001				0.25	0.43	0.53	45	N				34	CA

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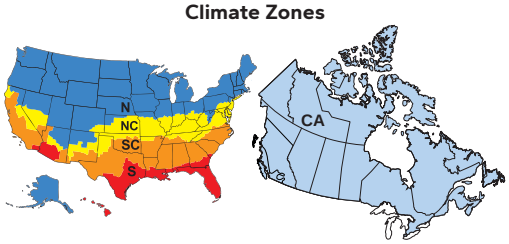

Glazing Performance - Total Unit

Glazing Thickness	Type of Glazing	NFRC Certified Product #	Glass (mm)		Gap Fill	U-Factor	SHGC	VLT	CR	Shaded Areas Meet ENERGY STAR® Performance Criteria in Zones Shown					
			Ext.	Int.						U. S.				Canada	
										Zone				ER	Zone
Fixed — 4mm/6mm Glazing										N	NC	SC	S		CA
1"	Clear IG	PEL-N-257-00011-00001	4	6	air	0.45	0.65	0.70	44						
	with grilles-between-the-glass	PEL-N-257-00011-00002				0.45	0.59	0.63	44						
	with applied grilles	PEL-N-257-00011-00005				0.45	0.53	0.56	44						
1"	Advanced Low-E IG	PEL-N-257-00036-00001	4	6	argon	0.26	0.31	0.60	59						
	with grilles-between-the-glass	PEL-N-257-00036-00002				0.26	0.29	0.54	59						
	with applied grilles	PEL-N-257-00036-00005				0.26	0.26	0.48	59						
1"	SunDefense™ IG	PEL-N-257-00054-00001	4	6	argon	0.26	0.24	0.55	60						
	with grilles-between-the-glass	PEL-N-257-00054-00002				0.26	0.22	0.50	60			SC	S		
	with applied grilles	PEL-N-257-00054-00005				0.26	0.20	0.44	60			SC	S		
1"	SunDefense+ IG	PEL-N-257-02468-00001	4	6	argon	0.22	0.23	0.54	48	N	NC	SC	S		
	with grilles-between-the-glass	PEL-N-257-02469-00001				0.22	0.21	0.49	48	N	NC	SC	S		
	with applied grilles	PEL-N-257-02470-00001				0.22	0.19	0.43	48	N	NC	SC	S		
1"	AdvancedComfort Low-E IG	PEL-N-257-00078-00001	4	6	argon	0.22	0.31	0.58	48	N	NC				
	with grilles-between-the-glass	PEL-N-257-00078-00002				0.22	0.28	0.52	48	N	NC				
	with applied grilles	PEL-N-257-00078-00005				0.22	0.25	0.47	48	N	NC				
1"	NaturalSun Low-E IG	PEL-N-257-00066-00001	4	6	argon	0.27	0.58	0.68	59					40	CA
	with grilles-between-the-glass	PEL-N-257-00066-00002				0.27	0.53	0.61	59					37	CA
	with applied grilles	PEL-N-257-00066-00005				0.27	0.47	0.54	59						
1"	NaturalSun+ Low-E IG	PEL-N-257-02432-00001	4	6	argon	0.23	0.53	0.66	47	N				42	CA
	with grilles-between-the-glass	PEL-N-257-02433-00001				0.23	0.48	0.59	47	N				39	CA
	with applied grilles	PEL-N-257-02434-00001				0.23	0.43	0.53	47	N				36	CA
Fixed — 4mm/6mm with Foam Insulation															
1"	Advanced Low-E IG	PEL-N-257-00228-00001	4	6	argon	0.26	0.31	0.60	60						
	with grilles-between-the-glass	PEL-N-257-00228-00002				0.26	0.29	0.54	60						
	with applied grilles	PEL-N-257-00228-00005				0.26	0.26	0.48	60						
1"	SunDefense™ IG	PEL-N-257-00246-00001	4	6	argon	0.25	0.24	0.55	60		NC				
	with grilles-between-the-glass	PEL-N-257-00246-00002				0.25	0.22	0.50	60		NC	SC	S		
	with applied grilles	PEL-N-257-00246-00005				0.25	0.20	0.44	60		NC	SC	S		
1"	SunDefense+ IG	PEL-N-257-02576-00001	4	6	argon	0.21	0.23	0.54	49	N	NC	SC	S	27	CA
	with grilles-between-the-glass	PEL-N-257-02577-00001				0.21	0.21	0.49	49	N	NC	SC	S	26	CA
	with applied grilles	PEL-N-257-02578-00001				0.21	0.19	0.43	49	N	NC	SC	S	25	CA
1"	AdvancedComfort Low-E IG	PEL-N-257-00270-00001	4	6	argon	0.21	0.31	0.58	48	N	NC			32	CA
	with grilles-between-the-glass	PEL-N-257-00270-00002				0.21	0.28	0.52	48	N	NC			30	CA
	with applied grilles	PEL-N-257-00270-00005				0.21	0.25	0.47	48	N	NC			28	CA
1"	NaturalSun Low-E IG	PEL-N-257-00258-00001	4	6	argon	0.27	0.58	0.68	59					40	CA
	with grilles-between-the-glass	PEL-N-257-00258-00002				0.27	0.53	0.61	59					37	CA
	with applied grilles	PEL-N-257-00258-00005				0.27	0.47	0.54	59						
1"	NaturalSun+ Low-E IG	PEL-N-257-02540-00001	4	6	argon	0.22	0.53	0.66	48	N				43	CA
	with grilles-between-the-glass	PEL-N-257-02541-00001				0.22	0.48	0.59	48	N				40	CA
	with applied grilles	PEL-N-257-02542-00001				0.22	0.43	0.53	48	N				37	CA

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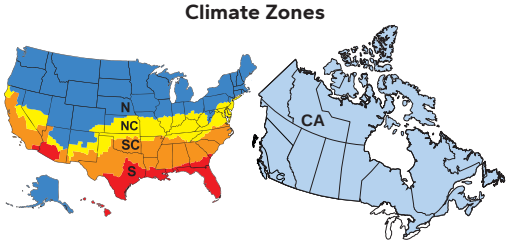
Climate Zones



Glazing Performance - Total Unit

Glazing Thickness	Type of Glazing	NFRC Certified Product #	Glass (mm) Ext.	Glass (mm) Int.	Gap Fill	U-Factor	SHGC	VLT	CR	Shaded Areas Meet ENERGY STAR® Performance Criteria in Zones Shown — U. S. Zone N	NC	SC	S	Canada ER	Canada Zone
Fixed — 4mm/6mm with High Altitude Glazing															
1"	(HA) Advanced Low-E IG	PEL-N-257-00035-00001	4	6	air	0.30	0.32	0.60	56						
	with grilles-between-the-glass	PEL-N-257-00035-00002				0.30	0.29	0.54	56						
	with applied grilles	PEL-N-257-00035-00005				0.30	0.26	0.48	56						
1"	(HA) SunDefense IG	PEL-N-257-00053-00001	4	6	air	0.30	0.24	0.55	56						
	with grilles-between-the-glass	PEL-N-257-00053-00002				0.30	0.22	0.50	56				S		
	with applied grilles	PEL-N-257-00053-00005				0.30	0.20	0.44	56				S		
1"	(HA) SunDefense IG	PEL-N-257-02465-00001	4	6	air	0.24	0.23	0.54	45		NC	SC	S		
	with grilles-between-the-glass	PEL-N-257-02466-00001				0.24	0.21	0.49	45		NC	SC	S		
	with applied grilles	PEL-N-257-02467-00001				0.24	0.19	0.43	45		NC	SC	S		
1"	(HA) AdvancedComfort Low-E IG	PEL-N-257-00077-00001	4	6	air	0.24	0.31	0.58	44		NC				
	with grilles-between-the-glass	PEL-N-257-00077-00002				0.24	0.28	0.52	44		NC				
	with applied grilles	PEL-N-257-00077-00005				0.24	0.25	0.47	44		NC				
1"	(HA) NaturalSun Low-E IG	PEL-N-257-00065-00001	4	6	air	0.31	0.58	0.68	55					35	CA
	with grilles-between-the-glass	PEL-N-257-00065-00002				0.31	0.52	0.61	55						
	with applied grilles	PEL-N-257-00065-00005				0.31	0.47	0.54	55						
1"	(HA) NaturalSun Low-E IG	PEL-N-257-02429-00001	4	6	air	0.25	0.52	0.66	44	N				39	CA
	with grilles-between-the-glass	PEL-N-257-02430-00001				0.25	0.47	0.59	44	N				36	CA
	with applied grilles	PEL-N-257-02431-00001				0.25	0.43	0.53	44	N				34	CA
Fixed — 4mm/6mm with High Altitude Glazing and Foam Insulation															
1"	(HA) Advanced Low-E IG	PEL-N-257-00227-00001	4	6	air	0.30	0.32	0.60	56						
	with grilles-between-the-glass	PEL-N-257-00227-00002				0.30	0.29	0.54	56						
	with applied grilles	PEL-N-257-00227-00005				0.30	0.26	0.48	56						
1"	(HA) SunDefense IG	PEL-N-257-00245-00001	4	6	air	0.29	0.24	0.55	57						
	with grilles-between-the-glass	PEL-N-257-00245-00002				0.29	0.22	0.50	57				S		
	with applied grilles	PEL-N-257-00245-00005				0.29	0.20	0.44	57				S		
1"	(HA) SunDefense IG	PEL-N-257-02573-00001	4	6	air	0.24	0.23	0.54	45		NC	SC	S		
	with grilles-between-the-glass	PEL-N-257-02574-00001				0.24	0.21	0.49	45		NC	SC	S		
	with applied grilles	PEL-N-257-02575-00001				0.24	0.19	0.43	45		NC	SC	S		
1"	(HA) AdvancedComfort Low-E IG	PEL-N-257-00269-00001	4	6	air	0.24	0.31	0.58	44		NC				
	with grilles-between-the-glass	PEL-N-257-00269-00002				0.24	0.28	0.52	44		NC				
	with applied grilles	PEL-N-257-00269-00005				0.24	0.25	0.47	44		NC				
1"	(HA) NaturalSun Low-E IG	PEL-N-257-00257-00001	4	6	air	0.31	0.58	0.68	56					35	CA
	with grilles-between-the-glass	PEL-N-257-00257-00002				0.31	0.52	0.61	56						
	with applied grilles	PEL-N-257-00257-00005				0.31	0.47	0.54	56						
1"	(HA) NaturalSun Low-E IG	PEL-N-257-02537-00001	4	6	air	0.25	0.52	0.66	44	N				39	CA
	with grilles-between-the-glass	PEL-N-257-02538-00001				0.25	0.47	0.59	44	N				36	CA
	with applied grilles	PEL-N-257-02539-00001				0.25	0.43	0.53	44	N				34	CA

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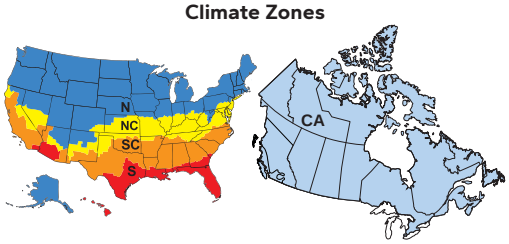
Climate Zones



Glazing Performance - Total Unit

Glazing Thickness	Type of Glazing	NFRC Certified Product #	Glass (mm)		Gap Fill	U-Factor	SHGC	VLT	CR	Shaded Areas Meet ENERGY STAR® Performance Criteria in Zones Shown					
			Ext.	Int.						U. S.				Canada	
										Zone				ER	Zone
Fixed — Tinted Glazing										N	NC	SC	S		CA
1"	Bronze Advanced Low-E IG	PEL-N-257-00038-00001	5	3	argon	0.27	0.28	0.39	61						
	with grilles-between-the-glass	PEL-N-257-00038-00002				0.27	0.25	0.35	61						
	with applied grilles	PEL-N-257-00038-00005				0.27	0.23	0.32	61			SC	S		
1"	Gray Advanced Low-E IG	PEL-N-257-00040-00001	5	3	argon	0.27	0.26	0.34	61						
	with grilles-between-the-glass	PEL-N-257-00040-00002				0.27	0.24	0.30	61						
	with applied grilles	PEL-N-257-00040-00005				0.27	0.21	0.27	61			SC	S		
1"	Green Advanced Low-E IG	PEL-N-257-00042-00001	5	3	argon	0.27	0.32	0.53	61						
	with grilles-between-the-glass	PEL-N-257-00042-00002				0.27	0.29	0.48	61						
	with applied grilles	PEL-N-257-00042-00005				0.27	0.26	0.43	61						
Fixed — Tinted Glazing with Foam Insulation															
1"	Bronze Advanced Low-E IG	PEL-N-257-00230-00001	5	3	argon	0.26	0.28	0.39	61						
	with grilles-between-the-glass	PEL-N-257-00230-00002				0.26	0.25	0.35	61						
	with applied grilles	PEL-N-257-00230-00005				0.26	0.23	0.32	61			SC	S		
1"	Gray Advanced Low-E IG	PEL-N-257-00232-00001	5	3	argon	0.26	0.26	0.34	61						
	with grilles-between-the-glass	PEL-N-257-00232-00002				0.26	0.24	0.30	61						
	with applied grilles	PEL-N-257-00232-00005				0.26	0.21	0.27	61			SC	S		
1"	Green Advanced Low-E IG	PEL-N-257-00234-00001	5	3	argon	0.26	0.32	0.53	61						
	with grilles-between-the-glass	PEL-N-257-00234-00002				0.26	0.29	0.48	61						
	with applied grilles	PEL-N-257-00234-00005				0.26	0.26	0.43	61						
Fixed — Tinted Glazing with High Altitude Glazing															
1"	Bronze Advanced Low-E IG	PEL-N-257-00037-00001	5	3	air	0.31	0.28	0.39	57						
	with grilles-between-the-glass	PEL-N-257-00037-00002				0.31	0.26	0.35	57						
	with applied grilles	PEL-N-257-00037-00005				0.31	0.23	0.32	57				S		
1"	Gray Advanced Low-E IG	PEL-N-257-00039-00001	5	3	air	0.31	0.26	0.34	57						
	with grilles-between-the-glass	PEL-N-257-00039-00002				0.31	0.24	0.30	57						
	with applied grilles	PEL-N-257-00039-00005				0.31	0.22	0.27	57				S		
1"	Green Advanced Low-E IG	PEL-N-257-00041-00001	5	3	air	0.31	0.32	0.53	57						
	with grilles-between-the-glass	PEL-N-257-00041-00002				0.31	0.29	0.48	57						
	with applied grilles	PEL-N-257-00041-00005				0.31	0.26	0.43	57						
Fixed — Tinted Glazing with Foam Insulation and High Altitude Glazing															
1"	Bronze Advanced Low-E IG	PEL-N-257-00229-00001	5	3	air	0.30	0.28	0.39	58						
	with grilles-between-the-glass	PEL-N-257-00229-00002				0.30	0.26	0.35	58						
	with applied grilles	PEL-N-257-00229-00005				0.30	0.23	0.32	58				S		
1"	Gray Advanced Low-E IG	PEL-N-257-00231-00001	5	3	air	0.30	0.26	0.34	58						
	with grilles-between-the-glass	PEL-N-257-00231-00002				0.30	0.24	0.30	58						
	with applied grilles	PEL-N-257-00231-00005				0.30	0.22	0.27	58				S		
1"	Green Advanced Low-E IG	PEL-N-257-00233-00001	5	3	air	0.30	0.32	0.53	58						
	with grilles-between-the-glass	PEL-N-257-00233-00002				0.30	0.29	0.48	58						
	with applied grilles	PEL-N-257-00233-00005				0.30	0.26	0.43	58						

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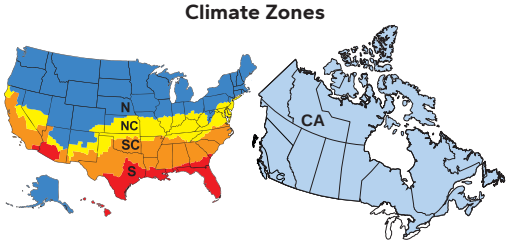
Climate Zones



Glazing Performance - Total Unit

Glazing Thickness	Type of Glazing	NFRC Certified Product #	Glass (mm)		Gap Fill	U-Factor	SHGC	VLT	CR	Shaded Areas Meet ENERGY STAR® Performance Criteria in Zones Shown					
			Ext.	Int.						U. S.				Canada	
										Zone				ER	Zone
Fixed — Laminated for Sound Glazing										N	NC	SC	S		CA
1"	Clear IG	PEL-N-257-00103-00001	4	7	air	0.45	0.64	0.70	45						
	with grilles-between-the-glass	PEL-N-257-00103-00002				0.45	0.58	0.63	45						
	with applied grilles	PEL-N-257-00103-00005				0.45	0.52	0.56	45						
1"	Clear IG	PEL-N-257-00109-00001	5	10	air	0.44	0.62	0.69	44						
	with grilles-between-the-glass	PEL-N-257-00109-00002				0.44	0.56	0.62	44						
	with applied grilles	PEL-N-257-00109-00005				0.44	0.51	0.55	44						
1"	Advanced Low-E IG	PEL-N-257-00108-00001	4	7	argon	0.26	0.31	0.60	60						
	with grilles-between-the-glass	PEL-N-257-00108-00002				0.26	0.28	0.53	60						
	with applied grilles	PEL-N-257-00108-00005				0.26	0.26	0.48	60						
1"	Advanced Low-E IG	PEL-N-257-00114-00001	5	10	argon	0.25	0.31	0.59	59		NC				
	with grilles-between-the-glass	PEL-N-257-00114-00002				0.25	0.28	0.53	59		NC				
	with applied grilles	PEL-N-257-00114-00005				0.25	0.26	0.47	59		NC				
1"	SunDefense™ IG	PEL-N-257-00106-00001	4	7	argon	0.26	0.24	0.55	60						
	with grilles-between-the-glass	PEL-N-257-00106-00002				0.26	0.22	0.50	60			SC	S		
	with applied grilles	PEL-N-257-00106-00005				0.26	0.20	0.44	60			SC	S		
1"	SunDefense™ IG	PEL-N-257-00112-00001	5	10	argon	0.25	0.24	0.54	59		NC				
	with grilles-between-the-glass	PEL-N-257-00112-00002				0.25	0.22	0.49	59		NC	SC	S		
	with applied grilles	PEL-N-257-00112-00005				0.25	0.20	0.43	59		NC	SC	S		
Fixed — Laminated for Sound Glazing with Foam Insulation															
1"	Advanced Low-E IG	PEL-N-257-00300-00001	4	7	argon	0.26	0.31	0.60	60						
	with grilles-between-the-glass	PEL-N-257-00300-00002				0.26	0.28	0.53	60						
	with applied grilles	PEL-N-257-00300-00005				0.26	0.26	0.48	60						
1"	Advanced Low-E IG	PEL-N-257-00306-00001	5	10	argon	0.25	0.31	0.59	59		NC				
	with grilles-between-the-glass	PEL-N-257-00306-00002				0.25	0.28	0.53	59		NC				
	with applied grilles	PEL-N-257-00306-00005				0.25	0.26	0.47	59		NC				
1"	SunDefense IG	PEL-N-257-00298-00001	4	7	argon	0.25	0.24	0.55	61		NC				
	with grilles-between-the-glass	PEL-N-257-00298-00002				0.25	0.22	0.50	61		NC	SC	S		
	with applied grilles	PEL-N-257-00298-00005				0.25	0.20	0.44	61		NC	SC	S		
1"	SunDefense IG	PEL-N-257-00304-00001	5	10	argon	0.24	0.24	0.54	59		NC				
	with grilles-between-the-glass	PEL-N-257-00304-00002				0.24	0.22	0.49	59		NC	SC	S		
	with applied grilles	PEL-N-257-00304-00005				0.24	0.20	0.43	59		NC	SC	S		

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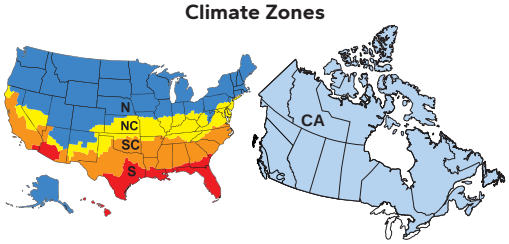

Glazing Performance - Total Unit

Glazing Thickness	Type of Glazing	NFRC Certified Product #	Glass (mm)		Gap Fill	U-Factor	SHGC	VLT	CR	Shaded Areas Meet ENERGY STAR® Performance Criteria in Zones Shown					
			Ext.	Int.						U. S.				Canada	
										Zone				ER	Zone
Fixed — Laminated for Sound with High Altitude Glazing										N	NC	SC	S		CA
1"	(HA) Advanced Low-E IG	PEL-N-257-00107-00001	4	7	air	0.30	0.32	0.60	56						
	with grilles-between-the-glass	PEL-N-257-00107-00002				0.30	0.29	0.53	56						
	with applied grilles	PEL-N-257-00107-00005				0.30	0.26	0.48	56						
1"	(HA) Advanced Low-E IG	PEL-N-257-00113-00001	5	10	air	0.30	0.32	0.59	55						
	with grilles-between-the-glass	PEL-N-257-00113-00002				0.30	0.29	0.53	55						
	with applied grilles	PEL-N-257-00113-00005				0.30	0.26	0.47	55						
1"	(HA) SunDefense IG	PEL-N-257-00105-00001	4	7	air	0.30	0.24	0.55	57						
	with grilles-between-the-glass	PEL-N-257-00105-00002				0.30	0.22	0.50	57				S		
	with applied grilles	PEL-N-257-00105-00005				0.30	0.20	0.44	57				S		
1"	(HA) SunDefense IG	PEL-N-257-00111-00001	5	10	air	0.29	0.24	0.54	55						
	with grilles-between-the-glass	PEL-N-257-00111-00002				0.29	0.22	0.49	55				S		
	with applied grilles	PEL-N-257-00111-00005				0.29	0.20	0.43	55				S		
Fixed — Laminated for Sound Glazing with Foam Insulation and High Altitude Glazing															
1"	(HA) Advanced Low-E IG	PEL-N-257-00299-00001	4	7	air	0.29	0.32	0.60	57						
	with grilles-between-the-glass	PEL-N-257-00299-00002				0.29	0.29	0.53	57						
	with applied grilles	PEL-N-257-00299-00005				0.29	0.26	0.48	57						
1"	(HA) Advanced Low-E IG	PEL-N-257-00305-00001	5	10	air	0.29	0.32	0.59	55						
	with grilles-between-the-glass	PEL-N-257-00305-00002				0.29	0.29	0.53	55						
	with applied grilles	PEL-N-257-00305-00005				0.29	0.26	0.47	55						
1"	(HA) SunDefense IG	PEL-N-257-00297-00001	4	7	air	0.29	0.24	0.55	57						
	with grilles-between-the-glass	PEL-N-257-00297-00002				0.29	0.22	0.50	57				S		
	with applied grilles	PEL-N-257-00297-00005				0.29	0.20	0.44	57				S		
1"	(HA) SunDefense IG	PEL-N-257-00303-00001	5	10	air	0.29	0.24	0.54	56						
	with grilles-between-the-glass	PEL-N-257-00303-00002				0.29	0.22	0.49	56				S		
	with applied grilles	PEL-N-257-00303-00005				0.29	0.20	0.43	56				S		

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SHGC = Solar Heat Gain Coefficient
VLT % = Visible Light Transmission
CR = Condensation Resistance
ER = Canadian Energy Rating

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The Canadian values shown are based on the updated ENERGY STAR® 2020 initiative.

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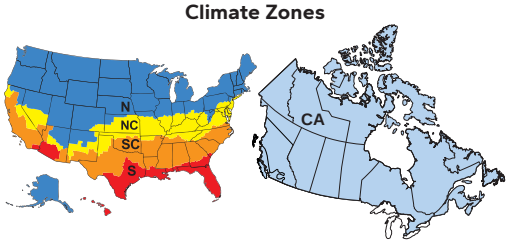
Climate Zones



Glazing Performance - Total Unit

Glazing Thickness	Type of Glazing	NFRC Certified Product #	Glass (mm)		Gap Fill	U-Factor	SHGC	VLT	CR	Shaded Areas Meet ENERGY STAR® Performance Criteria in Zones Shown					
			Ext.	Int.						U. S.				Canada	
										Zone				ER	Zone
Fixed — with Impact-Resistant Laminated Glazing										N	NC	SC	S		CA
1"	Clear IG (PVB)	PEL-N-257-00385-00001	3	8.6	air	0.44	0.64	0.70	45						
	with grilles-between-the-glass	PEL-N-257-00386-00001				0.44	0.58	0.63	45						
	with applied grilles	PEL-N-257-02345-00001				0.44	0.52	0.56	45						
1"	Clear IG (SGP)	PEL-N-257-00887-00001	5	10.1	air	0.45	0.62	0.69	45						
	with grilles-between-the-glass	PEL-N-257-00888-00001				0.45	0.56	0.62	45						
	with applied grilles	PEL-N-257-02353-00001				0.45	0.51	0.56	45						
1"	Clear IG (SGP)	PEL-N-257-01067-00001	5	11.7	air	0.45	0.61	0.68	44						
	with grilles-between-the-glass	PEL-N-257-01068-00001				0.46	0.55	0.61	44						
	with applied grilles	PEL-N-257-02361-00001				0.45	0.50	0.54	44						
1-1/4"	Clear IG (PVB)	PEL-N-257-01173-00001	6	13.6	air	0.43	0.59	0.67	46						
	with grilles-between-the-glass	PEL-N-257-01174-00001				0.43	0.53	0.60	46						
	with applied grilles	PEL-N-257-02367-00001				0.43	0.48	0.54	46						
1-1/4"	Clear IG (SGP)	PEL-N-257-01281-00001	6	13.6	air	0.43	0.59	0.66	46						
	with grilles-between-the-glass	PEL-N-257-01282-00001				0.43	0.53	0.59	46						
	with applied grilles	PEL-N-257-02375-00001				0.43	0.48	0.53	46						
1"	Advanced Low-E IG (PVB)	PEL-N-257-00435-00001	3	8.6	argon	0.26	0.32	0.59	60						
	with grilles-between-the-glass	PEL-N-257-00436-00001				0.26	0.29	0.53	60						
	with applied grilles	PEL-N-257-02350-00001				0.26	0.26	0.47	60						
1"	Advanced Low-E IG (SGP)	PEL-N-257-00919-00001	5	10.1	argon	0.26	0.31	0.59	59						
	with grilles-between-the-glass	PEL-N-257-00920-00001				0.27	0.28	0.53	59						
	with applied grilles	PEL-N-257-02356-00001				0.26	0.26	0.47	59						
1"	Advanced Low-E IG (SGP)	PEL-N-257-01115-00001	5	11.7	argon	0.26	0.31	0.57	58						
	with grilles-between-the-glass	PEL-N-257-01116-00001				0.28	0.29	0.52	58						
	with applied grilles	PEL-N-257-02366-00001				0.26	0.26	0.46	58						
1-1/4"	Advanced Low-E IG (PVB)	PEL-N-257-01223-00001	6	13.6	argon	0.25	0.31	0.57	60		NC				
	with grilles-between-the-glass	PEL-N-257-01224-00001				0.25	0.28	0.51	60		NC				
	with applied grilles	PEL-N-257-02372-00001				0.25	0.25	0.46	60		NC				
1-1/4"	Advanced Low-E IG (SGP)	PEL-N-257-01331-00001	6	13.6	argon	0.25	0.31	0.56	59		NC				
	with grilles-between-the-glass	PEL-N-257-01332-00001				0.25	0.28	0.50	59		NC				
	with applied grilles	PEL-N-257-02380-00001				0.25	0.25	0.45	59		NC				
1"	SunDefense™ IG (PVB)	PEL-N-257-00411-00001	3	8.6	argon	0.25	0.23	0.55	61		NC	SC	S		
	with grilles-between-the-glass	PEL-N-257-00412-00001				0.25	0.21	0.49	61		NC	SC	S		
	with applied grilles	PEL-N-257-02348-00001				0.25	0.19	0.44	61		NC	SC	S		
1"	SunDefense™ IG (SGP)	PEL-N-257-00905-00001	5	10.1	argon	0.25	0.24	0.55	59		NC				
	with grilles-between-the-glass	PEL-N-257-00906-00001				0.27	0.22	0.49	59			SC	S		
	with applied grilles	PEL-N-257-02358-00001				0.25	0.20	0.44	59		NC	SC	S		
1"	SunDefense™ IG (SGP)	PEL-N-257-01093-00001	5	11.7	argon	0.26	0.24	0.53	58						
	with grilles-between-the-glass	PEL-N-257-01094-00001				0.28	0.22	0.48	58			SC	S		
	with applied grilles	PEL-N-257-02364-00001				0.26	0.20	0.43	58			SC	S		
1-1/4"	SunDefense™ IG (PVB)	PEL-N-257-01199-00001	6	13.6	argon	0.25	0.23	0.53	60		NC	SC	S		
	with grilles-between-the-glass	PEL-N-257-01200-00001				0.25	0.21	0.48	60		NC	SC	S		
	with applied grilles	PEL-N-257-02370-00001				0.25	0.19	0.42	60		NC	SC	S		
1-1/4"	SunDefense™ IG (SGP)	PEL-N-257-01307-00001	6	13.6	argon	0.25	0.24	0.52	60		NC				
	with grilles-between-the-glass	PEL-N-257-01308-00001				0.25	0.22	0.47	60		NC	SC	S		
	with applied grilles	PEL-N-257-02378-00001				0.25	0.20	0.41	60		NC	SC	S		
1"	Bronze Advanced Low-E IG (PVB)	PEL-N-257-00447-00001	3	8.6	argon	0.26	0.31	0.43	61						
	with grilles-between-the-glass	PEL-N-257-00448-00001				0.26	0.28	0.39	61						
	with applied grilles	PEL-N-257-02352-00001				0.26	0.25	0.35	61						
1"	Bronze Advanced Low-E IG (SGP)	PEL-N-257-00923-00001	5	10.1	argon	0.26	0.30	0.41	59						
	with grilles-between-the-glass	PEL-N-257-00924-00001				0.27	0.28	0.36	59						
	with applied grilles	PEL-N-257-02360-00001				0.26	0.25	0.32	59						
1-1/4"	Bronze Advanced Low-E IG (PVB)	PEL-N-257-01235-00001	6	13.6	argon	0.25	0.30	0.33	59		NC				
	with grilles-between-the-glass	PEL-N-257-01236-00001				0.25	0.27	0.30	59		NC				
	with applied grilles	PEL-N-257-02374-00001				0.25	0.24	0.26	59		NC				

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Glazing Performance - Total Unit

Glazing Thickness	Type of Glazing	NFRC Certified Product #	Glass (mm) Ext.	Glass (mm) Int.	Gap Fill	U-Factor	SHGC	VLT	CR	Shaded Areas Meet ENERGY STAR® Performance Criteria in Zones Shown: U. S. Zone N	NC	SC	S	Canada ER	Canada Zone CA
Fixed — with Foam Insulation and Impact-Resistant Laminated Glazing															
1"	Advanced Low-E IG (PVB)	PEL-N-257-01415-00001	3	8.6	argon	0.25	0.32	0.59	61		NC				
	with grilles-between-the-glass	PEL-N-257-01416-00001				0.25	0.29	0.53	61		NC				
	with applied grilles	PEL-N-257-02386-00001				0.25	0.26	0.47	61		NC				
1"	Advanced Low-E IG (SGP)	PEL-N-257-01899-00001	5	10.1	argon	0.25	0.31	0.59	60		NC				
	with grilles-between-the-glass	PEL-N-257-01900-00001				0.25	0.28	0.53	60		NC				
	with applied grilles	PEL-N-257-02392-00001				0.25	0.26	0.47	60		NC				
1"	Advanced Low-E IG (SGP)	PEL-N-257-02095-00001	5	11.7	argon	0.26	0.31	0.57	59						
	with grilles-between-the-glass	PEL-N-257-02096-00001				0.26	0.29	0.52	59						
	with applied grilles	PEL-N-257-02402-00001				0.26	0.26	0.46	59						
1-1/4"	Advanced Low-E IG (PVB)	PEL-N-257-02203-00001	6	13.6	argon	0.25	0.31	0.57	60		NC				
	with grilles-between-the-glass	PEL-N-257-02204-00001				0.25	0.28	0.51	60		NC				
	with applied grilles	PEL-N-257-02408-00001				0.25	0.25	0.46	60		NC				
1-1/4"	Advanced Low-E IG (SGP)	PEL-N-257-02311-00001	6	13.6	argon	0.25	0.31	0.56	60		NC				
	with grilles-between-the-glass	PEL-N-257-02312-00001				0.25	0.28	0.50	60		NC				
	with applied grilles	PEL-N-257-02416-00001				0.25	0.25	0.45	60		NC				
1"	SunDefense™ IG (PVB)	PEL-N-257-01391-00001	3	8.6	argon	0.25	0.23	0.55	61		NC	SC	S		
	with grilles-between-the-glass	PEL-N-257-01392-00001				0.25	0.21	0.49	61		NC	SC	S		
	with applied grilles	PEL-N-257-02384-00001				0.25	0.19	0.44	61		NC	SC	S		
1"	SunDefense™ IG (SGP)	PEL-N-257-01885-00001	5	10.1	argon	0.25	0.24	0.55	60		NC				
	with grilles-between-the-glass	PEL-N-257-01886-00001				0.25	0.22	0.49	60		NC	SC	S		
	with applied grilles	PEL-N-257-02394-00001				0.25	0.20	0.44	60		NC	SC	S		
1"	SunDefense™ IG (SGP)	PEL-N-257-02073-00001	5	11.7	argon	0.25	0.24	0.53	59		NC				
	with grilles-between-the-glass	PEL-N-257-02074-00001				0.25	0.22	0.48	59		NC	SC	S		
	with applied grilles	PEL-N-257-02400-00001				0.25	0.20	0.43	59		NC	SC	S		
1-1/4"	SunDefense™ IG (PVB)	PEL-N-257-02179-00001	6	13.6	argon	0.24	0.23	0.53	60		NC	SC	S		
	with grilles-between-the-glass	PEL-N-257-02180-00001				0.24	0.21	0.48	60		NC	SC	S		
	with applied grilles	PEL-N-257-02406-00001				0.24	0.19	0.42	60		NC	SC	S		
1-1/4"	SunDefense™ IG (SGP)	PEL-N-257-02287-00001	6	13.6	argon	0.24	0.24	0.52	60		NC				
	with grilles-between-the-glass	PEL-N-257-02288-00001				0.24	0.22	0.47	60		NC	SC	S		
	with applied grilles	PEL-N-257-02414-00001				0.24	0.20	0.41	60		NC	SC	S		
1"	Bronze Advanced Low-E IG (PVB)	PEL-N-257-01427-00001	3	8.6	argon	0.25	0.31	0.43	61		NC				
	with grilles-between-the-glass	PEL-N-257-01428-00001				0.25	0.28	0.39	61		NC				
	with applied grilles	PEL-N-257-02388-00001				0.25	0.25	0.35	61		NC				
1"	Bronze Advanced Low-E IG (SGP)	PEL-N-257-01903-00001	5	10.1	argon	0.25	0.30	0.41	59		NC				
	with grilles-between-the-glass	PEL-N-257-01904-00001				0.25	0.28	0.36	59		NC				
	with applied grilles	PEL-N-257-02396-00001				0.25	0.25	0.32	59		NC				
1-1/4"	Bronze Advanced Low-E IG (PVB)	PEL-N-257-02215-00001	6	13.6	argon	0.25	0.30	0.33	60		NC				
	with grilles-between-the-glass	PEL-N-257-02216-00001				0.25	0.27	0.30	60		NC				
	with applied grilles	PEL-N-257-02410-00001				0.25	0.24	0.26	60		NC				

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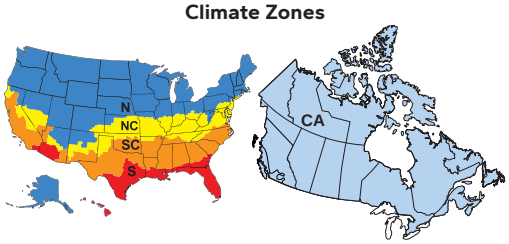
Climate Zones



Glazing Performance - Total Unit

Glazing Thickness	Type of Glazing	NFRC Certified Product #	Glass (mm)			Gap Fill	U-Factor	SHGC	VLT	CR	Shaded Areas Meet ENERGY STAR® Performance Criteria in Zones Shown					
			Ext.	Mid.	Int.						U. S.				Canada	
											Zone				ER	Zone
Fixed — Triple-Pane Glazing											N	NC	SC	S		CA
1-1/4"	Advanced Low-E IG	PEL-N-257-00137-00001	3	3	3	argon	0.16	0.29	0.54	73	N	NC			37	CA
	with grilles-between-the-glass	PEL-N-257-00137-00002					0.16	0.26	0.48	73	N	NC			35	CA
	with applied grilles	PEL-N-257-00137-00005					0.16	0.24	0.43	73	N	NC			34	CA
1-1/4"	Advanced Low-E IG	PEL-N-257-00141-00001	4	4	4	argon	0.17	0.28	0.53	71	N	NC			35	CA
	with grilles-between-the-glass	PEL-N-257-00142-00001					0.17	0.26	0.47	71	N	NC			34	CA
	with applied grilles	PEL-N-257-00141-00002					0.17	0.23	0.42	71	N	NC	SC	S	32	CA
1-1/4"	Advanced Low-E IG	PEL-N-257-00147-00001	5	5	5	argon	0.19	0.28	0.52	69	N	NC			32	CA
	with grilles-between-the-glass	PEL-N-257-00148-00001					0.19	0.26	0.47	69	N	NC			31	CA
	with applied grilles	PEL-N-257-00147-00002					0.19	0.23	0.42	69	N	NC	SC	S	29	CA
1-1/4"	Advanced Low-E IG	PEL-N-257-00153-00001	6	6	6	argon	0.21	0.28	0.51	66	N	NC			30	CA
	with grilles-between-the-glass	PEL-N-257-00154-00001					0.22	0.25	0.46	66	N	NC				
	with applied grilles	PEL-N-257-00153-00002					0.21	0.23	0.41	66	N	NC	SC	S	27	CA
1-1/4"	SunDefense™ IG	PEL-N-257-00158-00001	3	3	3	argon	0.16	0.22	0.50	73	N	NC	SC	S	33	CA
	with grilles-between-the-glass	PEL-N-257-00158-00002					0.16	0.20	0.45	73	N	NC	SC	S	31	CA
	with applied grilles	PEL-N-257-00158-00005					0.16	0.18	0.40	73	N	NC	SC	S	30	CA
1-1/4"	SunDefense™ IG	PEL-N-257-00162-00001	4	4	4	argon	0.17	0.22	0.49	71	N	NC	SC	S	31	CA
	with grilles-between-the-glass	PEL-N-257-00163-00001					0.17	0.20	0.44	71	N	NC	SC	S	30	CA
	with applied grilles	PEL-N-257-00162-00002					0.17	0.18	0.39	71	N	NC	SC	S	29	CA
1-1/4"	SunDefense™ IG	PEL-N-257-00168-00001	5	5	5	argon	0.19	0.22	0.48	69	N	NC	SC	S	29	CA
	with grilles-between-the-glass	PEL-N-257-00169-00001					0.19	0.20	0.43	69	N	NC	SC	S	28	CA
	with applied grilles	PEL-N-257-00168-00002					0.19	0.18	0.39	69	N	NC	SC	S	27	CA
1-1/4"	SunDefense™ IG	PEL-N-257-00174-00001	6	6	6	argon	0.21	0.22	0.47	66	N	NC	SC	S	26	CA
	with grilles-between-the-glass	PEL-N-257-00175-00001					0.22	0.20	0.42	66	N	NC	SC	S		
	with applied grilles	PEL-N-257-00174-00002					0.21	0.18	0.38	66	N	NC	SC	S	24	CA
1-1/4"	NaturalSun Low-E IG	PEL-N-257-00116-00001	3	3	3	argon	0.16	0.49	0.61	73	N				48	CA
	with grilles-between-the-glass	PEL-N-257-00116-00002					0.16	0.44	0.55	73	N				45	CA
	with applied grilles	PEL-N-257-00116-00005					0.16	0.40	0.49	73	N	NC			43	CA
1-1/4"	NaturalSun Low-E IG	PEL-N-257-00120-00001	4	4	4	argon	0.17	0.47	0.60	70	N				46	CA
	with grilles-between-the-glass	PEL-N-257-00121-00001					0.18	0.43	0.54	70	N				42	CA
	with applied grilles	PEL-N-257-00120-00002					0.17	0.39	0.48	70	N	NC			41	CA
1-1/4"	NaturalSun Low-E IG	PEL-N-257-00126-00001	5	5	5	argon	0.19	0.47	0.59	68	N				43	CA
	with grilles-between-the-glass	PEL-N-257-00127-00001					0.20	0.42	0.53	68	N				39	CA
	with applied grilles	PEL-N-257-00126-00002					0.19	0.38	0.47	68	N	NC			38	CA
1-1/4"	NaturalSun Low-E IG	PEL-N-257-00132-00001	6	6	6	argon	0.21	0.45	0.58	65	N				40	CA
	with grilles-between-the-glass	PEL-N-257-00133-00001					0.22	0.41	0.52	65	N				36	CA
	with applied grilles	PEL-N-257-00132-00002					0.21	0.37	0.46	65	N	NC			35	CA

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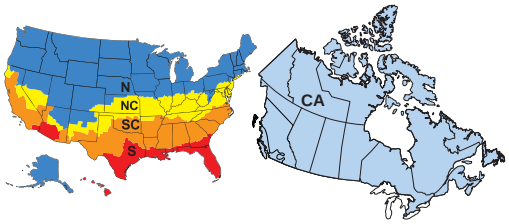
Climate Zones



Glazing Performance - Total Unit

Glazing Thickness	Type of Glazing	NFRC Certified Product #	Glass (mm) Ext.	Glass (mm) Mid.	Glass (mm) Int.	Gap Fill	U-Factor	SHGC	VLT	CR	Shaded Areas Meet ENERGY STAR® Performance Criteria in Zones Shown: U. S. Zone N	U. S. Zone NC	U. S. Zone SC	U. S. Zone S	Canada ER	Canada Zone CA
Fixed — Triple-Pane Glazing and Foam Insulation											N	NC	SC	S		CA
1-1/4"	Advanced Low-E IG	PEL-N-257-00329-00001	3	3	3	argon	0.15	0.29	0.54	74	N	NC			38	CA
	with grilles-between-the-glass	PEL-N-257-00329-00002					0.15	0.26	0.48	74	N	NC			36	CA
	with applied grilles	PEL-N-257-00329-00005					0.15	0.24	0.43	74	N	NC			35	CA
1-1/4"	Advanced Low-E IG	PEL-N-257-00333-00001	4	4	4	argon	0.16	0.28	0.53	71	N	NC			36	CA
	with grilles-between-the-glass	PEL-N-257-00334-00001					0.17	0.26	0.47	71	N	NC			34	CA
	with applied grilles	PEL-N-257-00333-00002					0.16	0.23	0.42	71	N	NC	SC	S	33	CA
1-1/4"	Advanced Low-E IG	PEL-N-257-00339-00001	5	5	5	argon	0.18	0.28	0.52	69	N	NC			34	CA
	with grilles-between-the-glass	PEL-N-257-00340-00001					0.19	0.26	0.47	69	N	NC			31	CA
	with applied grilles	PEL-N-257-00339-00002					0.18	0.23	0.42	69	N	NC	SC	S	31	CA
1-1/4"	Advanced Low-E IG	PEL-N-257-00345-00001	6	6	6	argon	0.20	0.28	0.51	66	N	NC			31	CA
	with grilles-between-the-glass	PEL-N-257-00346-00001					0.21	0.25	0.46	66	N	NC			28	CA
	with applied grilles	PEL-N-257-00345-00002					0.20	0.23	0.41	66	N	NC	SC	S	28	CA
1-1/4"	SunDefense IG	PEL-N-257-00350-00001	3	3	3	argon	0.15	0.22	0.50	74	N	NC	SC	S	34	CA
	with grilles-between-the-glass	PEL-N-257-00350-00002					0.15	0.20	0.45	74	N	NC	SC	S	33	CA
	with applied grilles	PEL-N-257-00350-00005					0.15	0.18	0.40	74	N	NC	SC	S	32	CA
1-1/4"	SunDefense IG	PEL-N-257-00354-00001	4	4	4	argon	0.16	0.22	0.49	72	N	NC	SC	S	33	CA
	with grilles-between-the-glass	PEL-N-257-00355-00001					0.17	0.20	0.44	72	N	NC	SC	S	30	CA
	with applied grilles	PEL-N-257-00354-00002					0.16	0.18	0.39	72	N	NC	SC	S	30	CA
1-1/4"	SunDefense IG	PEL-N-257-00360-00001	5	5	5	argon	0.18	0.22	0.48	69	N	NC	SC	S	30	CA
	with grilles-between-the-glass	PEL-N-257-00361-00001					0.19	0.20	0.43	69	N	NC	SC	S	28	CA
	with applied grilles	PEL-N-257-00360-00002					0.18	0.18	0.39	69	N	NC	SC	S	28	CA
1-1/4"	SunDefense IG	PEL-N-257-00366-00001	6	6	6	argon	0.20	0.22	0.47	66	N	NC	SC	S	28	CA
	with grilles-between-the-glass	PEL-N-257-00367-00001					0.21	0.20	0.42	66	N	NC	SC	S	25	CA
	with applied grilles	PEL-N-257-00366-00002					0.20	0.18	0.38	66	N	NC	SC	S	25	CA
1-1/4"	NaturalSun Low-E IG	PEL-N-257-00308-00001	3	3	3	argon	0.16	0.49	0.61	73	N				48	CA
	with grilles-between-the-glass	PEL-N-257-00308-00002					0.16	0.44	0.55	73	N				45	CA
	with applied grilles	PEL-N-257-00308-00005					0.16	0.40	0.49	73	N	NC			43	CA
1-1/4"	NaturalSun Low-E IG	PEL-N-257-00312-00001	4	4	4	argon	0.17	0.47	0.60	71	N				46	CA
	with grilles-between-the-glass	PEL-N-257-00313-00001					0.17	0.43	0.54	71	N				43	CA
	with applied grilles	PEL-N-257-00312-00002					0.17	0.39	0.48	71	N	NC			41	CA
1-1/4"	NaturalSun Low-E IG	PEL-N-257-00318-00001	5	5	5	argon	0.19	0.47	0.59	69	N				43	CA
	with grilles-between-the-glass	PEL-N-257-00319-00001					0.19	0.42	0.53	69	N				40	CA
	with applied grilles	PEL-N-257-00318-00002					0.19	0.38	0.47	69	N	NC			38	CA
1-1/4"	NaturalSun Low-E IG	PEL-N-257-00324-00001	6	6	6	argon	0.21	0.45	0.58	66	N				40	CA
	with grilles-between-the-glass	PEL-N-257-00325-00001					0.22	0.41	0.52	66	N				36	CA
	with applied grilles	PEL-N-257-00324-00002					0.21	0.37	0.46	66	N	NC			35	CA

Continued on next page

R-Value = 1/U-Factor
SHGC = Solar Heat Gain Coefficient
VLT % = Visible Light Transmission
CR = Condensation Resistance
ER = Canadian Energy Rating

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ENERGY STAR® values are updated to 2023 (version 7) criteria.

The Canadian values shown are based on the updated ENERGY STAR® 2020 initiative.

For center-glass values, see the Product Performance section.

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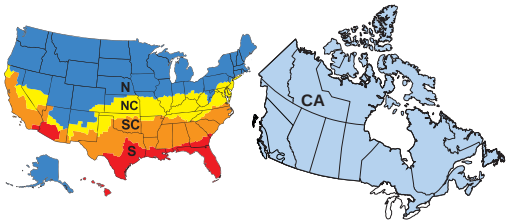
Climate Zones



Impervia® Fixed Frame Windows

Glazing Performance - Total Unit

Glazing Thickness	Type of Glazing	NFRC Certified Product #	Glass (mm) Ext.	Glass (mm) Mid.	Glass (mm) Int.	Gap Fill	U-Factor	SHGC	VLT	CR	Shaded Areas Meet ENERGY STAR® Performance Criteria in Zones Shown — U. S. Zone N	NC	SC	S	Canada ER	Canada Zone
Fixed — Triple-Pane High Altitude Glazing																
1-1/4"	(HA) Advanced Low-E IG	PEL-N-257-00136-00001	3	3	3	air	0.19	0.29	0.54	69	N	NC			33	CA
	with grilles-between-the-glass	PEL-N-257-00136-00002					0.19	0.27	0.48	69	N	NC			32	CA
	with applied grilles	PEL-N-257-00136-00005					0.19	0.24	0.43	69	N	NC			30	CA
1-1/4"	(HA) Advanced Low-E IG	PEL-N-257-00139-00001	4	4	4	air	0.20	0.29	0.53	67	N	NC			32	CA
	with grilles-between-the-glass	PEL-N-257-00140-00001					0.21	0.26	0.47	67	N	NC			29	CA
	with applied grilles	PEL-N-257-00139-00002					0.20	0.24	0.42	67	N	NC			29	CA
1-1/4"	(HA) Advanced Low-E IG	PEL-N-257-00145-00001	5	5	5	air	0.23	0.29	0.52	65		NC				
	with grilles-between-the-glass	PEL-N-257-00146-00001					0.23	0.26	0.47	65		NC				
	with applied grilles	PEL-N-257-00145-00002					0.23	0.24	0.42	65		NC				
1-1/4"	(HA) Advanced Low-E IG	PEL-N-257-00151-00001	6	6	6	air	0.25	0.28	0.51	62		NC				
	with grilles-between-the-glass	PEL-N-257-00152-00001					0.26	0.26	0.46	62						
	with applied grilles	PEL-N-257-00151-00002					0.25	0.23	0.41	62		NC	SC	S		
1-1/4"	(HA) SunDefense IG	PEL-N-257-00157-00001	3	3	3	air	0.19	0.22	0.50	70	N	NC	SC	S	29	CA
	with grilles-between-the-glass	PEL-N-257-00157-00002					0.19	0.20	0.45	70	N	NC	SC	S	28	CA
	with applied grilles	PEL-N-257-00157-00005					0.19	0.18	0.40	70	N	NC	SC	S	27	CA
1-1/4"	(HA) SunDefense IG	PEL-N-257-00160-00001	4	4	4	air	0.20	0.22	0.49	67	N	NC	SC	S	28	CA
	with grilles-between-the-glass	PEL-N-257-00161-00001					0.21	0.20	0.44	67	N	NC	SC	S	25	CA
	with applied grilles	PEL-N-257-00160-00002					0.20	0.18	0.39	67	N	NC	SC	S	25	CA
1-1/4"	(HA) SunDefense IG	PEL-N-257-00166-00001	5	5	5	air	0.23	0.22	0.48	65		NC	SC	S		
	with grilles-between-the-glass	PEL-N-257-00167-00001					0.23	0.20	0.43	65		NC	SC	S		
	with applied grilles	PEL-N-257-00166-00002					0.23	0.18	0.39	65		NC	SC	S		
1-1/4"	(HA) SunDefense IG	PEL-N-257-00172-00001	6	6	6	air	0.25	0.22	0.47	62		NC	SC	S		
	with grilles-between-the-glass	PEL-N-257-00173-00001					0.26	0.20	0.42	62			SC	S		
	with applied grilles	PEL-N-257-00172-00002					0.25	0.18	0.38	62		NC	SC	S		
1-1/4"	(HA) NaturalSun Low-E IG	PEL-N-257-00115-00001	3	3	3	air	0.19	0.49	0.61	69	N				44	CA
	with grilles-between-the-glass	PEL-N-257-00115-00002					0.19	0.44	0.55	69	N				42	CA
	with applied grilles	PEL-N-257-00115-00005					0.19	0.40	0.49	69	N	NC			39	CA
1-1/4"	(HA) NaturalSun Low-E IG	PEL-N-257-00118-00001	4	4	4	air	0.21	0.47	0.60	67	N				41	CA
	with grilles-between-the-glass	PEL-N-257-00119-00001					0.21	0.43	0.54	67	N				39	CA
	with applied grilles	PEL-N-257-00118-00002					0.21	0.39	0.48	67	N	NC			36	CA
1-1/4"	(HA) NaturalSun Low-E IG	PEL-N-257-00124-00001	5	5	5	air	0.23	0.47	0.59	65	N				38	CA
	with grilles-between-the-glass	PEL-N-257-00125-00001					0.24	0.42	0.53	65	N				34	CA
	with applied grilles	PEL-N-257-00124-00002					0.23	0.38	0.47	65	N	NC				
1-1/4"	(HA) NaturalSun Low-E IG	PEL-N-257-00130-00001	6	6	6	air	0.26	0.45	0.58	62	N					
	with grilles-between-the-glass	PEL-N-257-00131-00001					0.27	0.41	0.52	62						
	with applied grilles	PEL-N-257-00130-00002					0.26	0.37	0.46	62						

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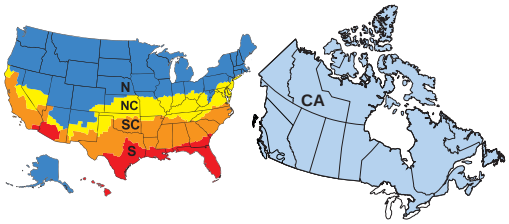
Climate Zones



Glazing Performance - Total Unit

Glazing Thickness	Type of Glazing	NFRC Certified Product #	Glass (mm) Ext.	Glass (mm) Mid.	Glass (mm) Int.	Gap Fill	U-Factor	SHGC	VLT	CR	Shaded Areas Meet ENERGY STAR® Performance Criteria in Zones Shown — U. S. Zone N	NC	SC	S	Canada ER	Canada Zone
Fixed — Triple-Pane High Altitude Glazing and Foam Insulation																
1-1/4"	(HA) Advanced Low-E IG	PEL-N-257-00328-00001	3	3	3	air	0.18	0.29	0.54	70	N	NC			34	CA
	with grilles-between-the-glass	PEL-N-257-00328-00002					0.18	0.27	0.48	70	N	NC			33	CA
	with applied grilles	PEL-N-257-00328-00005					0.18	0.24	0.43	70	N	NC			31	CA
1-1/4"	(HA) Advanced Low-E IG	PEL-N-257-00331-00001	4	4	4	air	0.20	0.29	0.53	67	N	NC			32	CA
	with grilles-between-the-glass	PEL-N-257-00332-00001					0.20	0.26	0.47	67	N	NC			30	CA
	with applied grilles	PEL-N-257-00331-00002					0.20	0.24	0.42	67	N	NC			29	CA
1-1/4"	(HA) Advanced Low-E IG	PEL-N-257-00337-00001	5	5	5	air	0.22	0.29	0.52	65	N	NC				
	with grilles-between-the-glass	PEL-N-257-00338-00001					0.23	0.26	0.47	65		NC				
	with applied grilles	PEL-N-257-00337-00002					0.22	0.24	0.42	65	N	NC				
1-1/4"	(HA) Advanced Low-E IG	PEL-N-257-00343-00001	6	6	6	air	0.25	0.28	0.51	62		NC				
	with grilles-between-the-glass	PEL-N-257-00344-00001					0.26	0.26	0.46	62						
	with applied grilles	PEL-N-257-00343-00002					0.25	0.23	0.41	62		NC	SC	S		
1-1/4"	(HA) SunDefense IG	PEL-N-257-00349-00001	3	3	3	air	0.18	0.22	0.50	70	N	NC	SC	S	30	CA
	with grilles-between-the-glass	PEL-N-257-00349-00002					0.18	0.20	0.45	70	N	NC	SC	S	29	CA
	with applied grilles	PEL-N-257-00349-00005					0.18	0.18	0.40	70	N	NC	SC	S	28	CA
1-1/4"	(HA) SunDefense IG	PEL-N-257-00352-00001	4	4	4	air	0.20	0.22	0.49	68	N	NC	SC	S	28	CA
	with grilles-between-the-glass	PEL-N-257-00353-00001					0.20	0.20	0.44	68	N	NC	SC	S	26	CA
	with applied grilles	PEL-N-257-00352-00002					0.20	0.18	0.39	68	N	NC	SC	S	25	CA
1-1/4"	(HA) SunDefense IG	PEL-N-257-00358-00001	5	5	5	air	0.22	0.22	0.48	65	N	NC	SC	S		
	with grilles-between-the-glass	PEL-N-257-00359-00001					0.23	0.20	0.43	65		NC	SC	S		
	with applied grilles	PEL-N-257-00358-00002					0.22	0.18	0.39	65	N	NC	SC	S		
1-1/4"	(HA) SunDefense IG	PEL-N-257-00364-00001	6	6	6	air	0.25	0.22	0.47	62		NC	SC	S		
	with grilles-between-the-glass	PEL-N-257-00365-00001					0.26	0.20	0.42	62			SC	S		
	with applied grilles	PEL-N-257-00364-00002					0.25	0.18	0.38	62		NC	SC	S		
1-1/4"	(HA) NaturalSun Low-E IG	PEL-N-257-00307-00001	3	3	3	air	0.19	0.49	0.61	69	N				44	CA
	with grilles-between-the-glass	PEL-N-257-00307-00002					0.19	0.44	0.55	69	N				42	CA
	with applied grilles	PEL-N-257-00307-00005					0.19	0.40	0.49	69	N	NC			39	CA
1-1/4"	(HA) NaturalSun Low-E IG	PEL-N-257-00310-00001	4	4	4	air	0.20	0.47	0.60	67	N				42	CA
	with grilles-between-the-glass	PEL-N-257-00311-00001					0.21	0.43	0.54	67	N				39	CA
	with applied grilles	PEL-N-257-00310-00002					0.20	0.39	0.48	67	N	NC			37	CA
1-1/4"	(HA) NaturalSun Low-E IG	PEL-N-257-00316-00001	5	5	5	air	0.22	0.47	0.59	65	N				40	CA
	with grilles-between-the-glass	PEL-N-257-00317-00001					0.23	0.42	0.53	65	N				35	CA
	with applied grilles	PEL-N-257-00316-00002					0.22	0.38	0.47	65	N	NC			34	CA
1-1/4"	(HA) NaturalSun Low-E IG	PEL-N-257-00322-00001	6	6	6	air	0.25	0.45	0.58	62	N				35	CA
	with grilles-between-the-glass	PEL-N-257-00323-00001					0.26	0.41	0.52	62	N					
	with applied grilles	PEL-N-257-00322-00002					0.25	0.37	0.46	62		NC				

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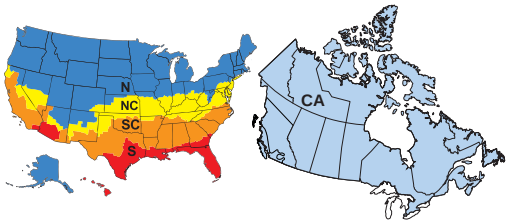
Climate Zones

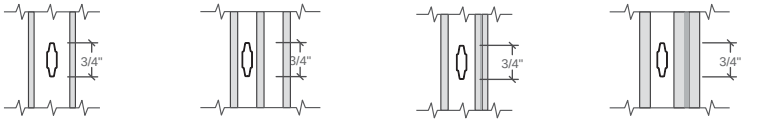


Grilles

Grille Profiles

Grilles-Between-the-Glass

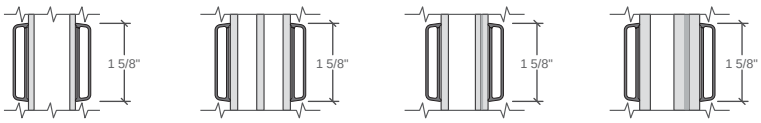
3/4" Contour GBG



1" Dual-Pane | 1-1/4" Triple-Pane | 1" Impact-Resistant | 1-1/4" Impact-Resistant

Applied Grilles

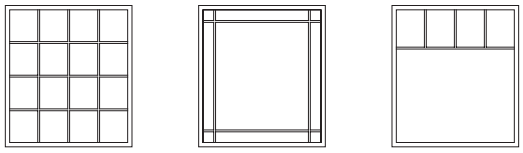
1-5/8" Applied SDL



1" Dual-Pane | 1-1/4" Triple-Pane | 1" Impact-Resistant | 1-1/4" Impact-Resistant

Grille Patterns

Grilles-Between-the-Glass

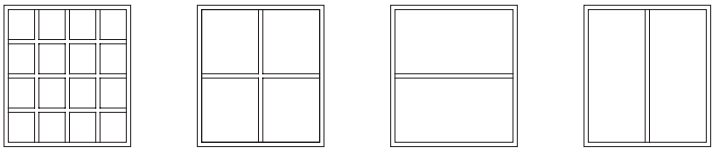


Traditional | 9-Lite Prairie[1] | Top Row[2]

(1) Standard corner lite dimension for Prairie patterns = 4" visible glass (VG).

(2) Standard visible glass to center line of separator bar = 14" or half of total visible glass height, whichever is smaller. Multiple rows are available up to 50% glass size.

Applied Grilles (to simulate multiple unit composites)



4 x 4 | 2 x 2 | 1 x 2 | 2 x 1

Equally Divided

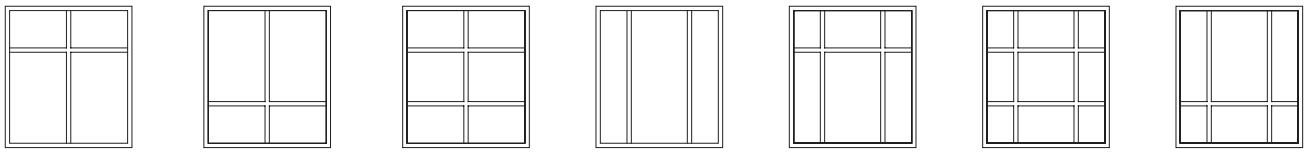
- Select up to 4 lites wide or high

Unequally Divided

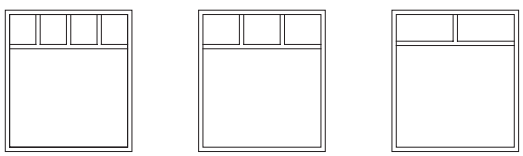
- Custom Specify - select up to 3 lites wide or high

Top Row

- Select desired number of lites wide. Horizontal bar height is variable up to 50% glass size.



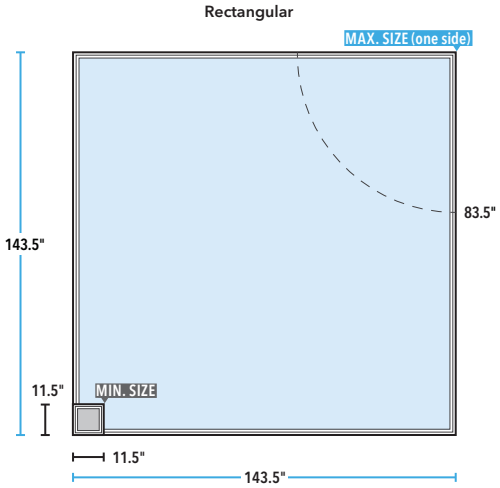
2 x 2 | 2 x 2 | 2 x 3 | 3 x 1 | 3 x 2 | 3 x 3 | 3 x 2



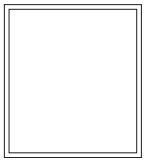
4 x 1 | 3 x 1 | 2 x 1

The above are examples only and are not to scale.

Design Data - Special Sizes and Dimensions



Single unit



Minimum
11-1/2" W x 11-1/2" H
(292 x 292)

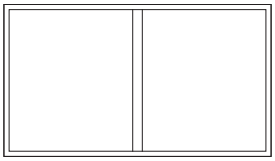
Maximum
11' 11-1/2"
(143-1/2")
(3 645)
In one direction
Short side cannot be > 83.5"
70 Ft² Maximum

General Notes:

- To convert areas to square meters (m²), multiply square feet by 0.0929.
- Rough Opening = Frame Dimension + 1/2".
- Keep frame dimensions to the nearest 1/8" increment

A composite is a window or door consisting of two or more sashes or panels within a single frame utilizing an integral mullion. Integral mullions are not impact certified.

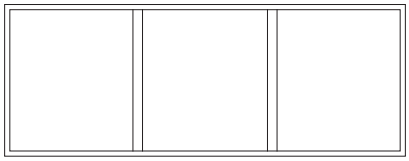
2-Wide Composite with Integral Mullion



Minimum
1' 11-1/2" W x 11-1/2" H
(23-1/2" x 11-1/2")
(597 x 292)

Maximum
11' 11-1/2" W or 6' 11-1/2" H
(143-1/2" x 83-1/2")
(3 645 x 2 121)
70 Ft² Maximum

3-Wide Composite with Integral Mullion



Minimum
2' 11-1/2" W x 11-1/2" H
(35-1/2" x 11-1/2")
(902 x 292)

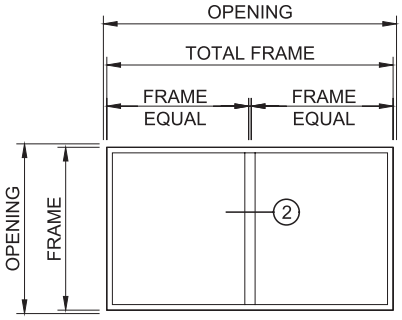
Maximum
11' 11-1/2" W or 6' 11-1/2" H
(143-1/2" x 83-1/2")
(3 645 x 2 121)
70 Ft² Maximum

Glass Formulas

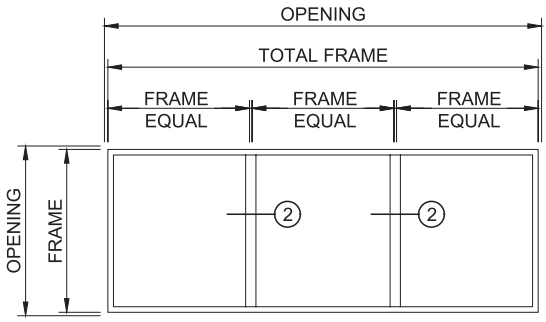
	Actual Glass		Visible Glass	
	Width	Height	Width	Height
Single units	Frame Width – 2.25"	Frame Height – 2.25"	Frame Width – 3.5"	Frame Height – 3.5"

When ordering and sizing composites, use overall frame/rough opening dimension.

Composite Configurations



2 2-Wide Fixed Frame with Integral Mullion



2 3-Wide Fixed Frame with Integral Mullion

Fixed Frame Direct Set Dimensions

Overall Composite[1]	Opening Width		Opening Height		Frame Width		Frame Height	
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
2-Wide	2' (24") (610)	12' (144") (3 658)	1' (12") (305)	7' (84") (2 134)	1' 11-1/2" (23-1/2") (597)	11' 11-1/2" (143-1/2") (3 645)	11-1/2" (292)	6' 11-1/2" (83-1/2") (2 121)
3-Wide	3' (36") (914)	12' (144") (3 658)	1' (12") (305)	7' (84") (2 134)	2' 11-1/2" (35-1/2") (902)	11' 11-1/2" (143-1/2") (3 645)	11-1/2" (292)	6' 11-1/2" (83-1/2") (2 121)

(1) Keep frame dimensions to nearest 1/8" increments.
Maximum composite frame size should be no more than 70 sq. ft.
When ordering and sizing composites, use overall frame/rough opening dimension.
Integral mullions are not impact certified.

Impact-resistant laminated glass will only be available on single units using Block Frame with a Prep for Screw Through Frame or Installation Clips attachment methods. Composite units do not qualify. See FPAS documents or Pella Installation Instructions for required anchor layout and details.

Impact-Resistant Performance Data

	1-1/4" SGP	1" PVB	1-1/4" PVB
Maximum Performance Grade[1]			
Up to 18 sq. ft. of frame	+50 / -55	+50 / -55	+50 / -55
Up to 31 sq. ft. of frame	+50 / -55	+50 / -55	+50 / -55
Up to 48 sq. ft. of frame	+50 / -55	+50 / -55	+50 / -55
Certification			
Hallmark	411-H-1507	411-H-1507	411-H-1507
FPAS / TDI[2]	FL 26584	FL 26584	FL 26584

The use of fixed frame direct set windows is limited by product performance rating, design pressure load chart, installation method and glass thickness or type.
Always consult local building code and Florida FPAS for performance and installation requirements.

Impact-Resistant Special Size Frame Dimensions

	Minimum	Maximum PVB	Maximum SGP
Fixed	11-1/2" W x 11-1/2" H (292 x 292)	2' 11-1/2" W x 6' 1-1/2" H (37-1/2" x 73-1/2") (902 x 1 867)	5' 0" W x 10' 0" H (60" x 120") (1 524 x 3 048)

Available within size range shown.
Keep frame dimensions to the nearest 1/8" increment.

All units with Impact-Resistant glazing are certified for wind zone 2, large missile rating C (Non-HVHZ).
(1) Maximum design pressure limited by unit testing or ASTM E 1300-04(H) and ASTM E 1300-04(D)
(2) Some size exclusions may apply.

Frame

- Frame is Duracast® fiberglass composite — five-layer pultruded fiberglass material [with optional foam insulation[1]], reinforced with a Pella patented interlocking mat.
- Overall frame depth is 3-1/4".
- Nominal wall thickness of Duracast fiberglass composite members is .070" to 0.135" thick.
- Frame corners are mitered, joined and bonded with corner lock, mechanical fasteners and with injected polyurethane adhesive sealant.
- Jambs contain factory-positioned installation screw locations.
- Optional factory-applied jamb extensions available in 4-9/16" and 6-9/16".

Exterior / Interior

- Duracast fiberglass composite surfaces with powder-coat paint finish.
  - Color is [White] [Brown] [Black] [Tan] [Morning Sky Gray].

  - or -

  - Dual-color option [Brown] [Black] [Tan] [Morning Sky Gray] exterior with White interior.

Glazing System

- Quality float glass complying with ASTM C 1036.
- Glazing Serviceability [Exterior and Interior access required - Wet glaze PUR sealant] [Interior access only required - Dry glaze foam tape]
- Dual-pane 1" insulating glass [[annealed] [tempered]] [obscure[2]], [[clear] [Advanced] [SunDefense™] [SunDefense+] [AdvancedComfort] [NaturalSun] [NaturalSun+] Low-E coated, with argon]] [[bronze] [gray] [green] Advanced Low-E [with Argon]] sealed and bonded to frame.
- High altitude glazing available.

  or

- Triple-Pane 1-1/4" insulating glass [[annealed] [tempered]] [obscure[2]] [clear] [[Advanced] [NaturalSun] Low-E coated [with argon]]

  or

- Open glaze also available – frame, glass stops, glass stop covers only.

  – or –

Impact-Resistant

- Silicone-glazed 1-1/4" dual-seal impact-resistant insulating glass SGP. [[tempered] [annealed]] exterior light is [[Advanced Low-E] [SunDefense] [clear] [bronze] [gray] [green]]. Laminated clear interior light.

  – or –

- Silicone-glazed [1] [1-1/4"] dual-seal impact-resistant insulating glass [PVB]. [[tempered] [annealed]] exterior light is [[Advanced Low-E] [SunDefense] [clear]]. Laminated [clear] interior light, or [[tempered] [annealed]] exterior light is [multi-layer Low-E]. Laminated [[bronze] [gray] [green]] interior light.

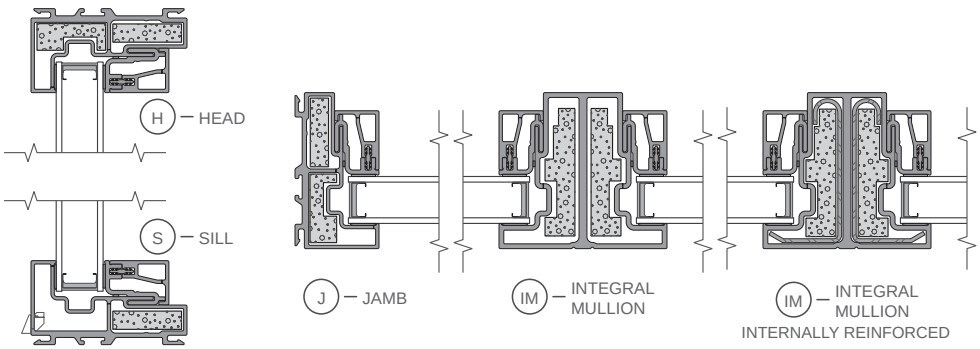
Optional Foam Insulation Inserts[1]

Optional Products

Grilles

- Grilles-Between-the-Glass
  - Insulating glass contains 3/4" contoured aluminum grilles permanently installed between two panes of glass.
  - Grilles are factory pre-finished [White] [Brown] [Black] [Tan] [Morning Sky Gray].
- Interior and Exterior Applied grilles
  - 1-5/8" aluminum grilles are applied to the interior and exterior of glass.
  - Grilles are factory pre-finished [White] [Brown] [Black] [Tan] [Morning Sky Gray].

3 1/4" Frame



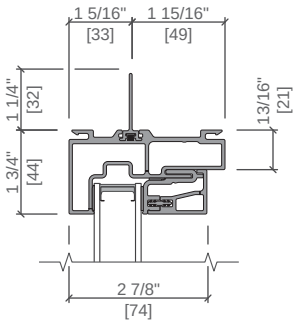
(1) Foam insulation inserts are not available with clear glazing.

(2) Obscure glazing is not available when AdvancedComfort Low-E coated IG is specified.

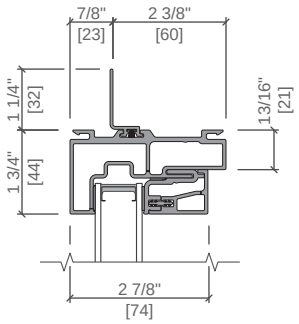
Unit Sections - Frame Types and Glazing Options

NEW CONSTRUCTION FRAME

Standard Block Frame with Standard Fin

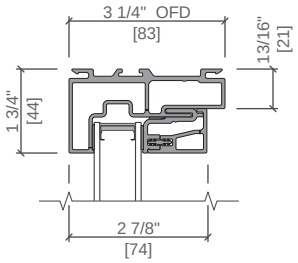


Standard Block Frame with Off Set Fin



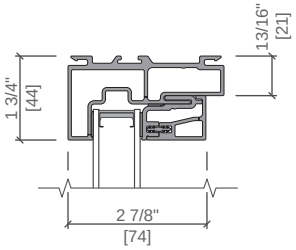
REPLACEMENT FRAME

Standard Block Frame

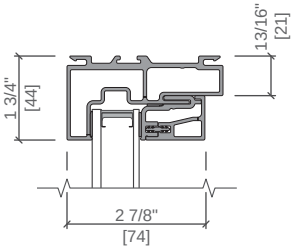


GLAZING OPTIONS

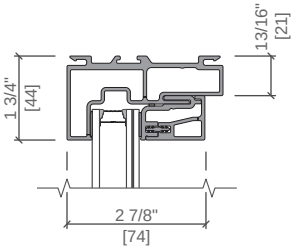
1" Dual IG



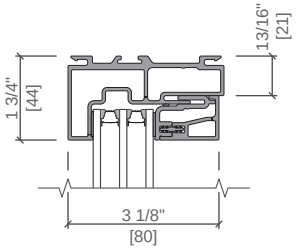
1" Sound IG



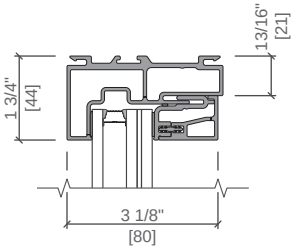
1" Impact-Resistant IG



1 1/4" Triple IG



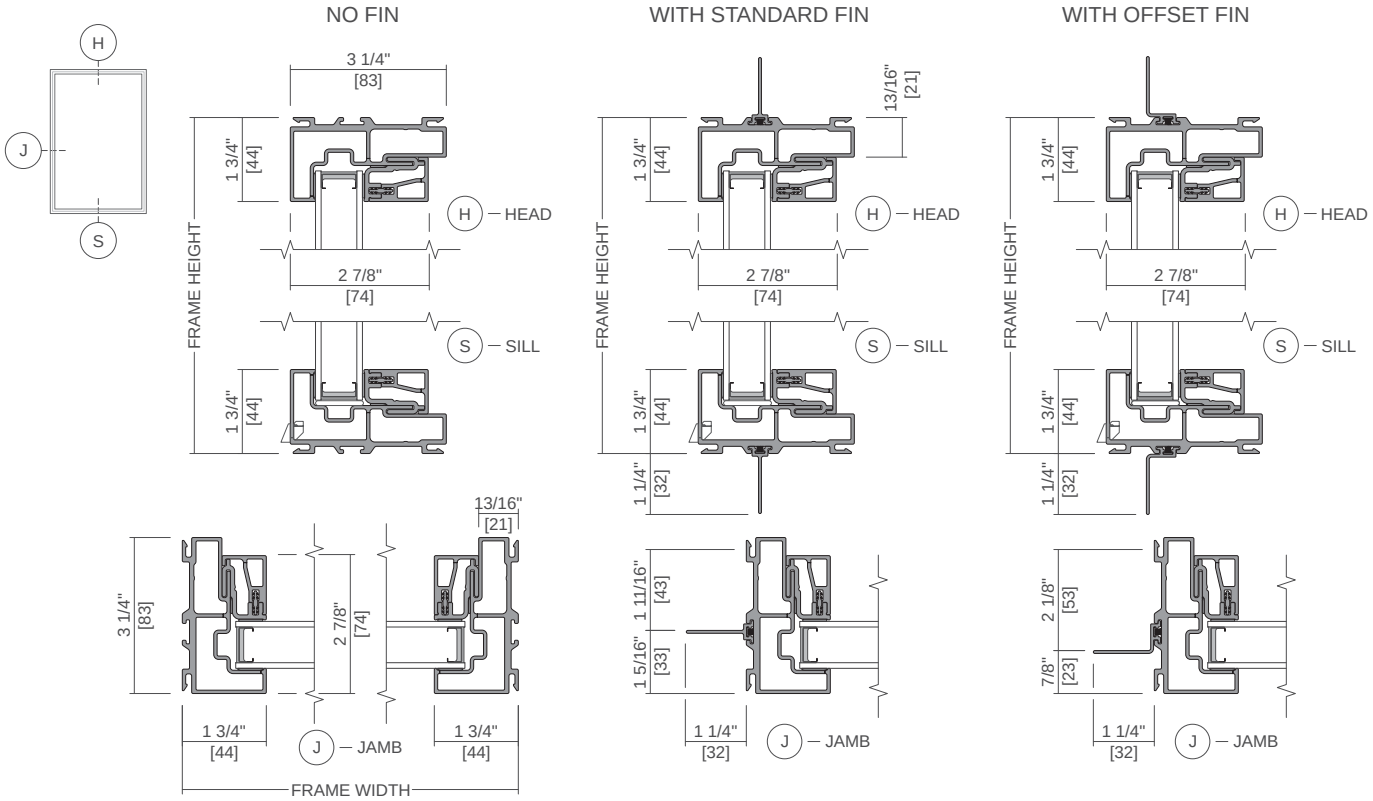
1 1/4" Impact-Resistant IG

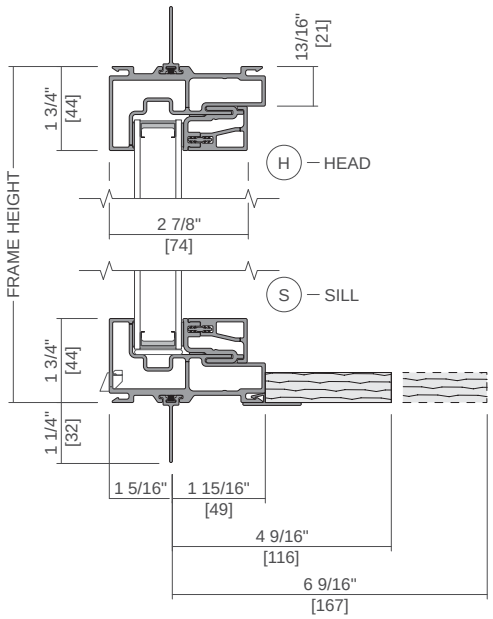


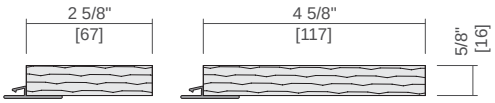
Scale 3" = 1' 0"

All dimensions are approximate.

Unit Sections - Dual-Pane







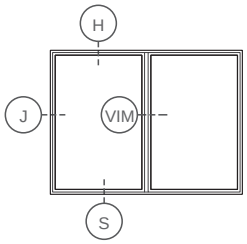
Optional Factory Applied Wood Jamb Extensions

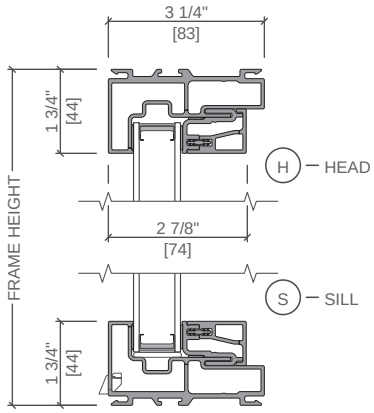
Scale 3" = 1' 0"

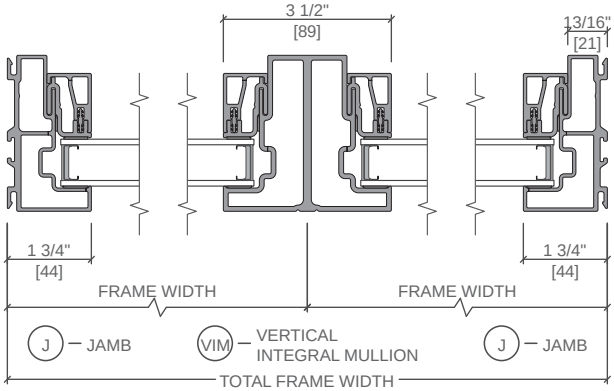
All dimensions are approximate.

Unit Sections - Dual-Pane Composites

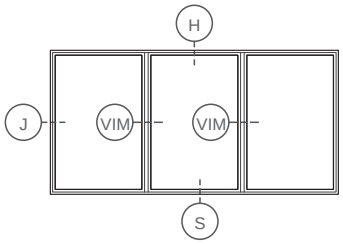
TWO WIDE HORIZONTAL UNIT

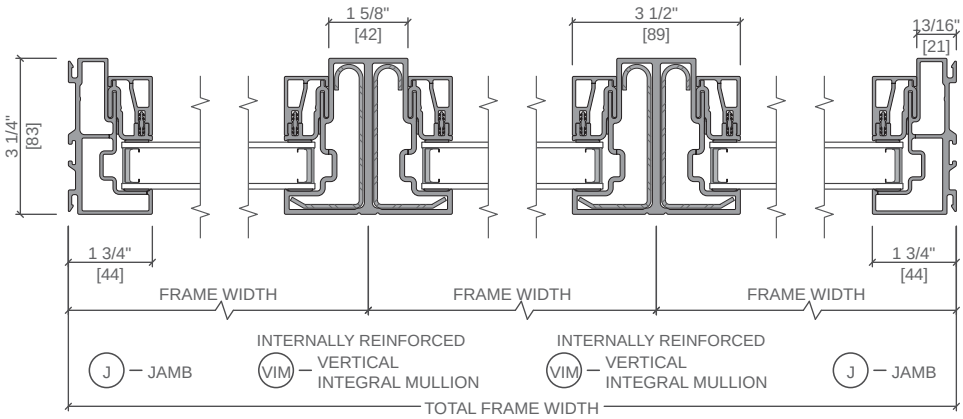




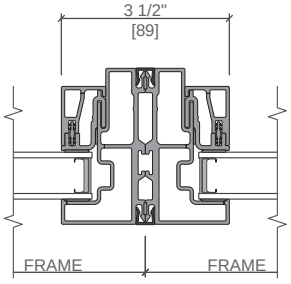


THREE WIDE HORIZONTAL UNIT





COMBINATION



JOINING MULLION
WITH TAPE
(Vertical Only)

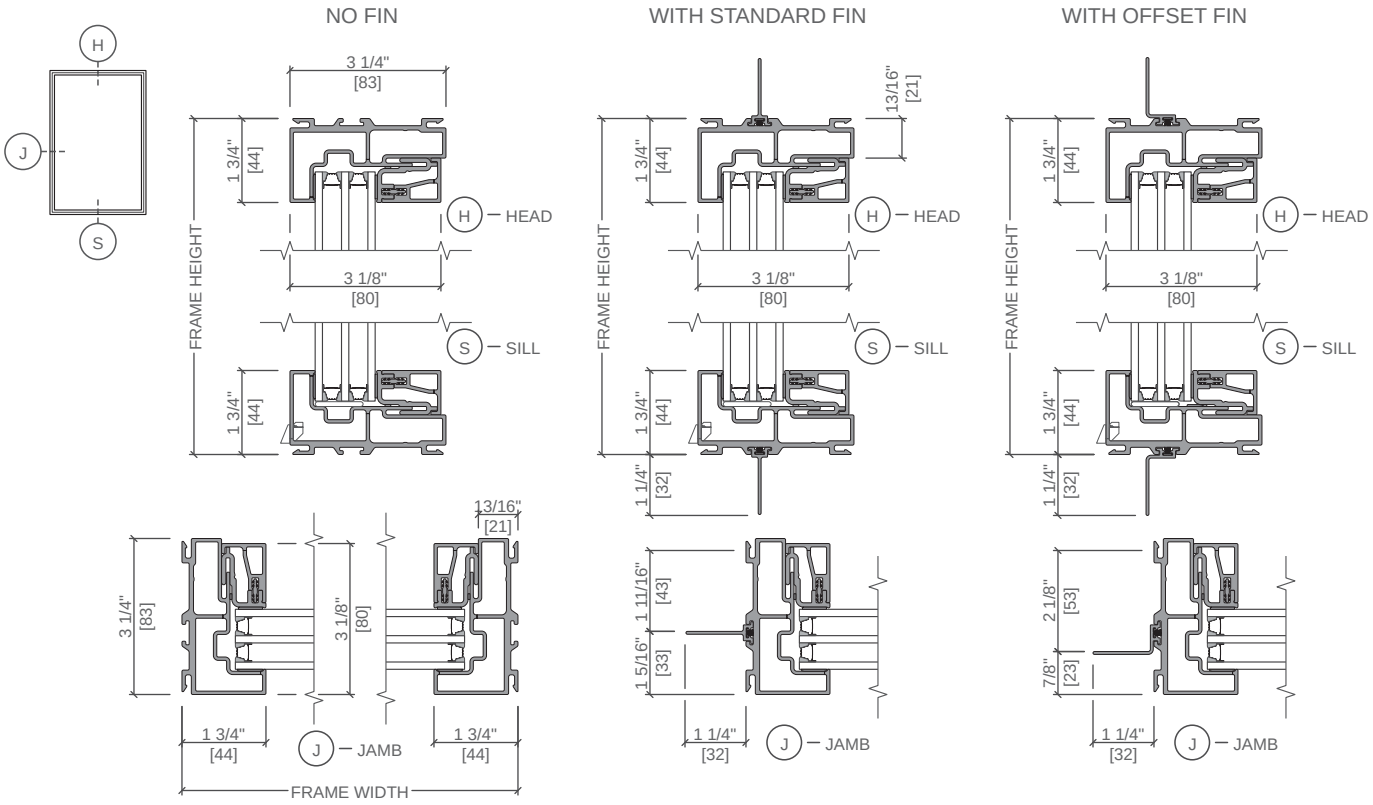
Scale 3" = 1' 0"

All dimensions are approximate.

See the Combinations section for mullion applications and structural limitations.

Integral mullions are not impact certified.

Unit Sections - Triple-Pane

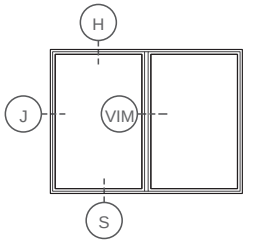


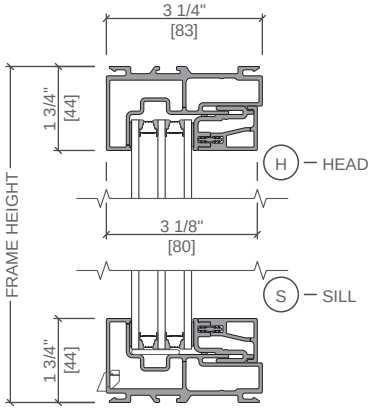
Scale 3" = 1' 0"

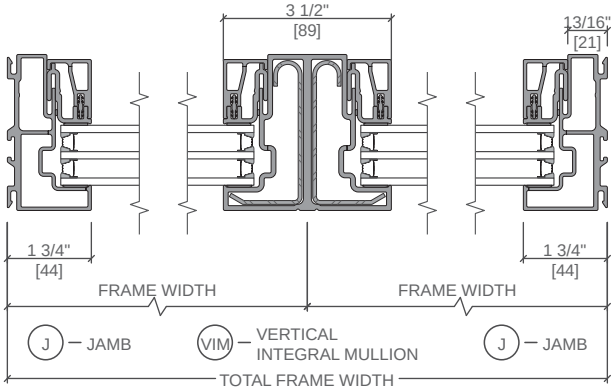
All dimensions are approximate.

Unit Sections - Triple-Pane Composites

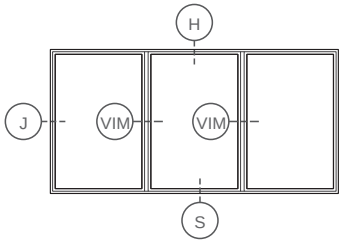
TWO WIDE HORIZONTAL UNIT

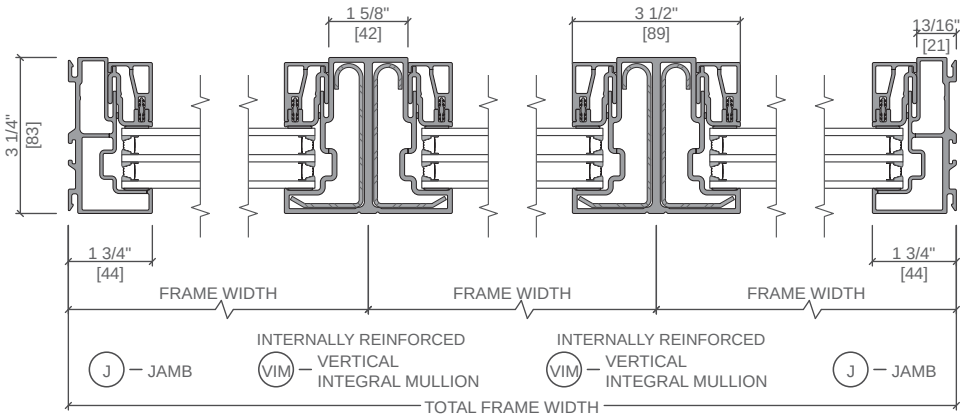






THREE WIDE HORIZONTAL UNIT





Scale 3" = 1' 0"

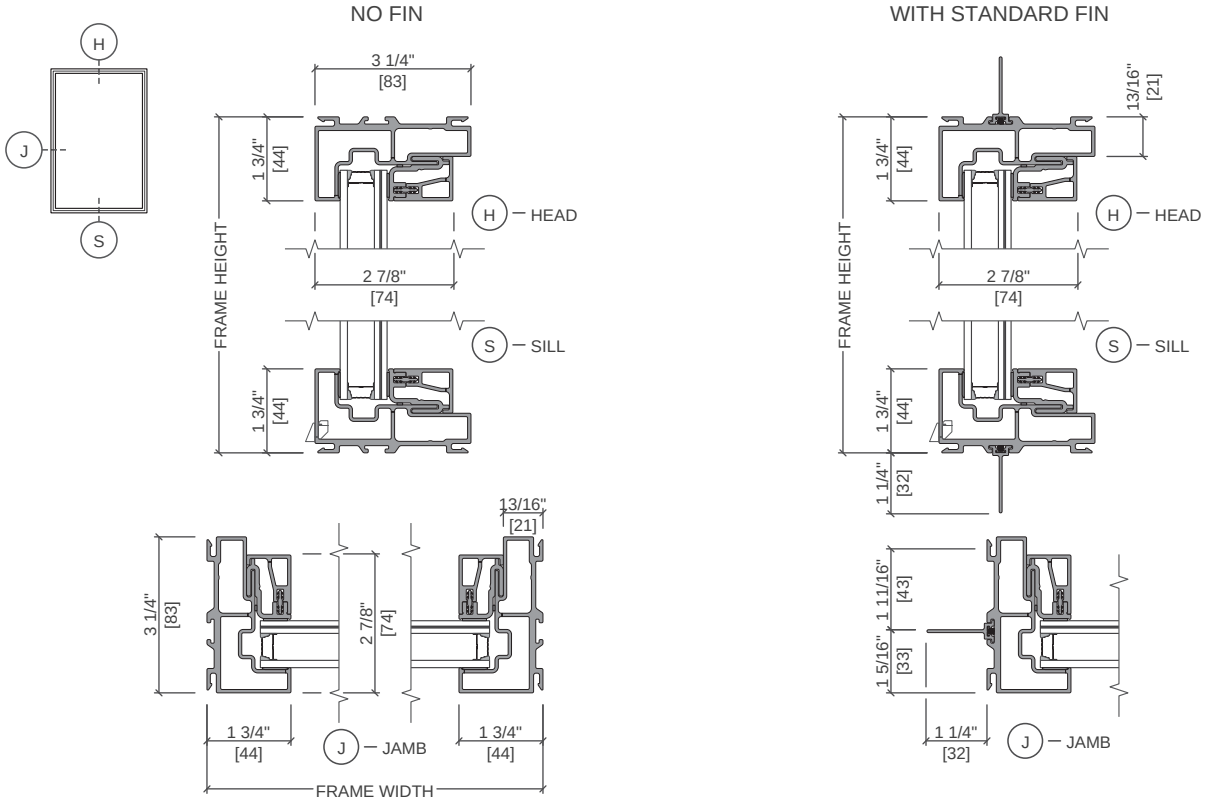
All dimensions are approximate.

See the Combinations section for mullion applications and structural limitations.

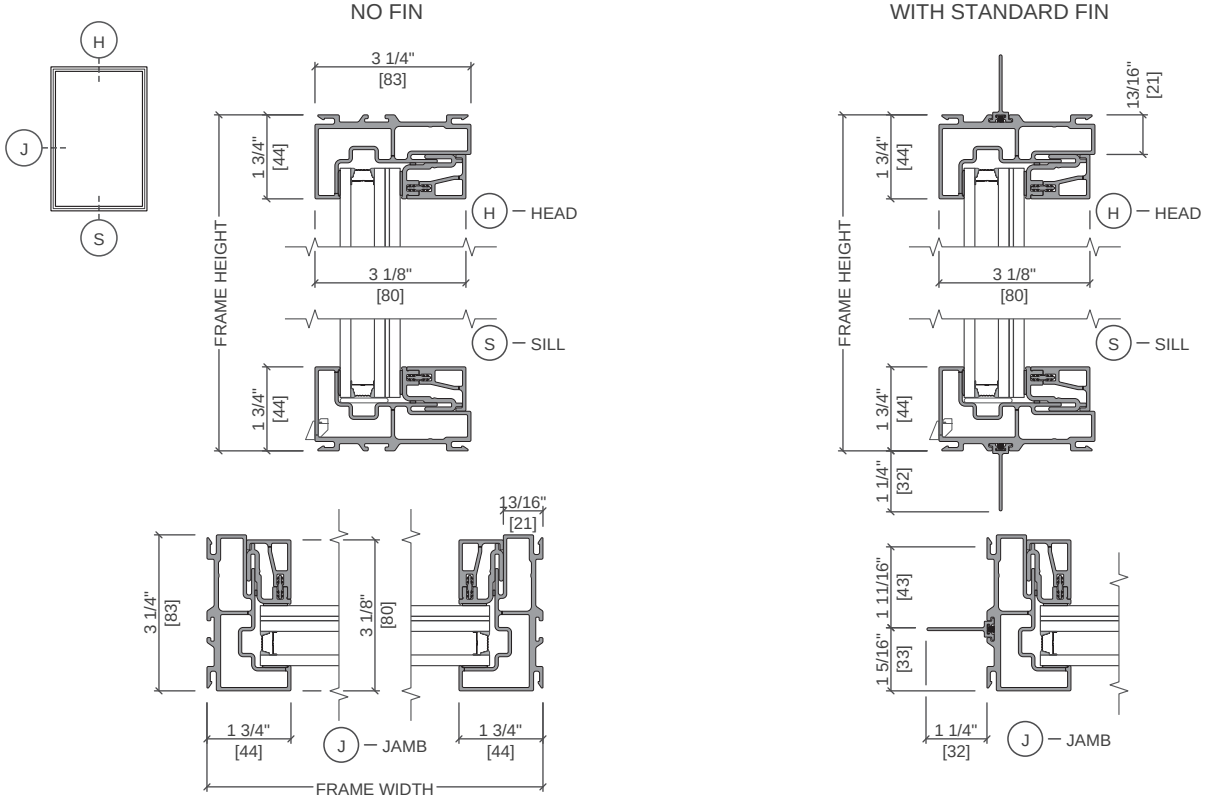
Integral mullions are not impact certified.

Unit Sections - Impact-Resistant Laminated Glass

1" IMPACT-RESISTANT IG



1 1/4" IMPACT-RESISTANT IG



Scale 3" = 1' 0"

All dimensions are approximate.

West Oak Coffee Project

Submitted on Aug 05, 2025

Kingdom Contracting

Dallas-Fort Worth Metropolitan Area, TX, USA

Cason Shobert
Cason@kingdomcontractingtx.com
972-316-7651

https://www.kingdomcontractingllc.com/

Client

Matt Fisher
matt@westoakcoffeebar.com
469-226-3193

Project address

114 West Oak Street, Denton, 76201

Billing address

114 West Oak Street, Denton, 76201

Cost summary

Task	Quantity	Amount
General conditions		**$18,300**
Site Prep Clear out upstairs unit, bring dumpster on site	1 each	$5,250
Planning, Management, and Inspections All administrative and managerial labor for pre-construction planning, project management, and execution of inspections w/ inspectors	1 each	$11,250
Furnishings Customer provided, assembled, and placed - no charges	1 each	$0
F&B Equipment Customer provided, assembled, and placed - no charges	1 each	$0

Task	Quantity	Amount
Dumpster Costs	3 each	$1,800
Estimated Quantity of dumpsters		
Framing		**$40,585**
Interior Walls	1 each	$18,000
Installation of new dividing walls and rebuilding to code existing walls		
Stair Access Modification (Framing)	1 each	$20,860
Framing for new stair Access and platform from downstairs - modify staircase to code		
Window Modification (Framing)	1 each	$1,725
Exterior Doors/Windows		**$7,200**
Window Replacements	2 each	$7,200
Replace/Install both rear windows		
Flat roofing		**$3,000**
Repairs	1 each	$3,000
Repair roof punch-throughs		
HVAC		**$92,350**
Basement	1 each	$0
None at this time - no charges		
Ground Floor	1 each	$31,200
Update, repair, and replace to restore functionality with new load calculations according to new top floor finishes		
Top Floor - New System	1 each	$55,900
New system according to plan specs - brand may vary		
Crane Service	1 each	$5,250
Service to lift new units to rooftop		
Electrical		**$28,500**
Rough Electric	1 each	$22,500
Rough electric		
Finish Electric	1 each	$6,000
No fixtures included - all light fixtures provided by customer - this is installation only		
Plumbing		**$37,280**
Rough Plumbing	1 each	$28,280
All materials and labor - may vary depending on unexpected plumbing needs from		
Finish plumbing	1 each	$9,000
Installation of all new equipment and fixtures. Plumbing equipment provided by contractor. Fixtures and coffee shop machines provided by customer.		

Task	Quantity	Amount
Flooring		**$47,537.50**
Red Oak or White Oak 2.5-3.5inch	1300 sq.ft	$23,887.50
Hard scrape Finish, stained, and sealed		
Stair Finishes	1 each	$15,400
All materials and labor		
Tile Installation	1 each	$8,250
Tile and grout provided by customer - labor and construction general materials provided by contractor		
Drywall/Plaster		**$12,180**
Drywall and Plaster	1 each	$12,180
Material and Labor for new sheetrock, drywall, and plaster/drywall repairs		
Painting		**$20,550**
Paint and Stain	1 each	$20,550
Labor and materials for prep, prime, paint, and stain		
Trim Carpentry and Cabinetry		**$46,200**
Trim Carpentry	1 each	$15,400
Baseboards, Door Casing, and Window Trim		
Interior Doors	1 each	$5,600
Window Seats and Bar Cabinetry	1 each	$25,200
Bathroom		**$8,450**
Bathroom Counter/Vanity	1 each	$5,200
Final price TBD based on design (by change order) estimated price included priced for mid tier quarts or granite. Need more information for bathroom design		
Wall Covering/FRP/Wall Tile	1 each	$3,250
Fire Sprinkler System		
Fire Protection System	1 each	$0
Awaiting information from city and/or engineer. Price TBD and added by change order		

Subtotal	$362,132.50
Total	**$362,132.50**

Quote validity:

15 Days

Payment schedule:

Deposit	30%	$108,639.75
Progress Payment	20%	$72,426.50
Progress Payment	20%	$72,426.50
Progress Payment	20%	$72,426.50
End of project	10%	$36,213.25

Construction schedule:

Estimated 90-120 Days from permit approval. Does not account for change orders, design changes, or extended wait times with the city for inspections.

Terms and conditions:

Purpose

The purpose of this Agreement is to set forth the terms and conditions under which Contractor will perform the construction work described above for Client.

Scope of Work

The Contractor shall perform the construction work described in this quote in accordance with all applicable laws and regulations and in accordance with the plans and specifications provided.
The Contractor must at all times comply with the applicable regulations and codes in force, the best practices applicable and the terms and conditions of this contract. He is also responsible for the work carried out by his workers and for those carried out by the subcontractors he hires.

Security and maintenance of the premises

The Contractor must ensure the safety of the premises, keep the premises clean and prevent any accumulation of unusable materials or other nuisances. The Contractor must protect the work, Client property and property adjacent to the site of the work from damage. Upon completion of the work, the contractor must remove all construction debris and clean the site of dirt caused by the work, at its sole costs.
The Contractor shall be solely responsible to take the necessary steps to protect the health and ensure the safety and physical well-being of construction workers.

Insurance

The Contractor confirms that he has adequate and sufficient civil liability insurance for the performance of the work provided for in the contract and that this insurance covers the subcontractors and the Client. The Contractor confirms that he has an adequate and sufficient damage insurance coverage protecting the value of the Client property, as well as his materials and equipment.

Payment Terms

Client shall pay Contractor in accordance with the payment schedule set forth in the contract. Change orders must be approved and paid in advance of work completion.

Change Orders

Any changes to the scope of work shall be set forth in a written change order signed by both parties. No change order shall be binding unless it is signed by both parties. Change orders must be approved and paid in advance of work completion.

Warranties

The Contractor undertakes to provide the Client if requested, at the end of the work, with the documents setting out the guarantees from the manufacturers and sellers in connection with the products or materials installed. In addition to applicable legal guarantees, the Client shall benefit from the Contractor's contractual guarantee for a minimal period of one year.

Default on the part of the Contractor or Client and termination of the contract

The Contractor is in default if he breaches any of his obligations under this contract. If the breach is material, the Client may terminate the contract if the Contractor does not correct the breach within the time limit provided in the written notice sent to him by the Client. The Client is in default if he breaches one of his obligations under this contract. If the breach is material, the Contractor may terminate the contract if the Client does not correct the breach within the time limit provided for in the written notice sent to him by the Contractor. The contract is terminated if the Contractor becomes insolvent, goes bankrupt or makes a general assignment of its assets for the benefit of its creditors, or if a bankruptcy receiver is appointed for the contractor.

Unilateral termination of the contract

The Contractor may terminate the contract unilaterally only for a serious reason, and never at an inopportune moment. Upon termination of the contract, the Client is bound to pay to the Contractor the value of the work performed before the end of the contract or before the notification of termination, as well as the value of the goods which have been handed over to him and which are usable, if any. For his part, the Contractor is bound to repay any advances he has received in excess of what he has earned.

The Client can unilaterally terminate the contract at any time even if the work has started. On the other hand, he must pay the Contractor the value of the work performed before the end of the contract or before the notification of termination, as well as the value of the goods which have been handed over to him and which are usable, if any. Each party may be held liable for the damage suffered by the other.

Material price fluctuation

The Contractor reserves the right to review with the Client the amount of the quote attributed to materials that will have undergone a significant increase between the time of signing the contract and the first day of work. Any revision to the contract must be approved by the Client and the Contractor before work begins.

Governing Law

This Agreement shall be governed by and construed in accordance with the laws of the contractor’s company address.

Entire Agreement

This Agreement constitutes the entire agreement between the parties and supersedes all prior negotiations, understandings, and agreements between the parties relating to the subject matter of this Agreement.

Signatures:

Matthew Fisher	Cason Shobert
Signed by Matthew Fisher Client Signed on Aug 05, 2025	Signed by Cason Shobert Contractor Signed on Aug 05, 2025

WEST OAK
COFFEE SHOP

116 WEST OAK STREET,
DENTON, TX

SITE PLAN (N.T.S.)

GENERAL NOTES

01. THE OWNER'S STANDARD FORM OF AGREEMENT AND GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION IS HEREBY MADE A PART OF THESE CONSTRACT DOCUMENTS.

02. THESE DESIGN DOCUMENTS ARE INTENDED TO BE A REPRESENTATION OF THE DESIGN INTENT.

03. THE SCOPE OF WORK TO BE PERFORMED IS AS DESCRIBED IN THESE GENERAL NOTES AS SHOWN ON THE ACCOMPANYING DRAWINGS AND SPECIFICATIONS, TO BE FURTHER SUPPLEMENTED BY EXPLANATORY DETAILS AS REQUIRED.

04. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IMMEDIATELY IN WRITING IF HE / SHE CANNOT COMPLY WITH ALL OF THE GENERAL NOTES CALLED FOR ON THIS SHEET AND ON ALL OTHER DRAWINGS.

05. ALL DESIGN DRAWINGS AND ALL CONSTRUCTION NOTES ARE COMPLIMENTARY AND WHAT IS CALLED FOR BY EITHER WILL BE BINDING AS IF CALLED FOR BY ALL. ANY WORK SHOWN OR REFERRED TO ON ANY ONE SET OF DRAWINGS SHALL BE PROVIDED AS THOUGH SHOWN ON ALL RELATED DRAWINGS.

06. ALL WORK LISTED OR IMPLIED ON THE DRAWING SHEETS OR NOTES SHALL BE SUPPLIED AND INSTALLED BY THE CONTRACTOR. IT IS EXPECTED THAT EACH CONTRACTOR SHALL CLOSELY COORDINATE HIS WORK WITH THE OTHER CONTRACTORS TO ASSURE THAT ALL SCHEDULES ARE MET.

07. THE CONSTRUCTION NOTES AND DRAWINGS ARE SUPPLIED TO ILLUSTRATE THE DESIGN AND GENERAL TYPE OF CONSTRUCTION DESIRED AND ARE INTENDED TO IMPLY A PREMIUM QUALITY OF CONSTRUCTION MATERIALS AND WORKMANSHIP THROUGHOUT.

08. THE CONTRACTORS, UPON ACCEPTANCE OF THE DRAWING, ASSUMES FULLY THE RESPONSIBILITY FOR THE CONSTRUCTION DOCUMENTS, FOR THEIR SPECIFIC TRADE, ON SITE DURING ALL PHASES OF CONSTRUCTION FOR USE BY ALL TRADES.

09. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY PROTECTION FOR THEIR WORK DURING ALL PHASES OF CONSTRUCTION AND UNTIL TURNED OVER TO THE OWNER.

10. CONTRACTORS SHALL SUBMIT ALL FABRICATION SHOP DRAWINGS AND FIXTURE CUT SHEETS TO THE ARCHITECT FOR APPROVAL IN A TIMELY MANNER.

11. PRIOR TO BEGINNING WORK, THE CONTRACTOR SHALL PROVIDE THE ARCHITECTS WITH CONSTRUCTION SCHEDULES SHOWING THE CHRONOLOGICAL PHASES OF THEIR WORK FOR THE TIMELY COMPLETION OF THE PROJECT. THIS SCHEDULE SHALL INDICATE ALL ORDERING LEAD TIMES, LENGTH OF TIME FOR EACH PHASE, ITS START AND COMPLETION, AND THE FINAL COMPLETION DATE.

12. THE CONTRACTORS, THEIR SUBCONTRACTORS, OR ANY OTHER CONTRACTOR INVOLVED IN THIS PROJECT SHALL TAKE NOTE THAT ANY COST CAUSED BY DEFECTIVE WORK AS A RESULT OF BUT NOT LIMITED TO INFERIOR WORKMANSHIP OR MATERIALS, IMPROPER SCHEDULING OR DELINQUENT ORDERING, SHALL BE BORNE BY THE PARTY RESPONSIBLE.

13. THE CONTRACTORS SHALL FURNISH WEEKLY FIELD PROGRESS REPORTS TO THE ARCHITECT FOR ALL PHASES OF CONSTRUCTION.

14. CONTRACTORS SHALL FILE WITH THE DEPARTMENT OF BUILDING INSPECTION, PAY FILING FEES OR DEPOSITS AND OBTAIN BUILDING PERMITS, SPECIFIC TRADE PERMITS, LICENSES AND APPROVALS.

15. ALL CONSTRUCTION TO BE AS PER ALL APPLICABLE AND GOVERNING FEDERAL, STATE AND LOCAL CODES AND ORDINANCES AND AUTHORITIES, INCLUDING ADA COMPLIANCE.

16. ALL DRAWINGS ARE DRAWN TO SCALE AS MUCH AS POSSIBLE BUT ARE NOT INTENDED TO BE, AND SHOULD NOT BE, SCALED.

17. ALL CONTRACTORS SHALL FURNISH AND INSTALL ALL REQUIREMENTS FOR SAFETY TO MEET OR EXCEED OSHA REQUIREMENTS.

18. CONTRACTORS SHALL COORDINATE ALL WORK TO ALLOW ACCESSIBILITY AND USE OF ALL ADJACENT SPACES.

19. DURING CONSTRUCTION, THE CONTRACTOR WILL BE RESPONSIBLE FOR REPAIRING ANY DAMAGE TO EXISTING CONSTRUCTION THAT IS TO REMAIN.

20. LANDSCAPE SHRUBS AND TREES TO REMAIN MUST BE PROTECTED FROM DAMAGE.

21. CONTRACTORS ARE TO COORDINATE WITH OWNER'S SEPERATE CONTRACTORS FOR DATA/PHONE, CABLE AND SECURITY SYSTEM INSTALLATION.

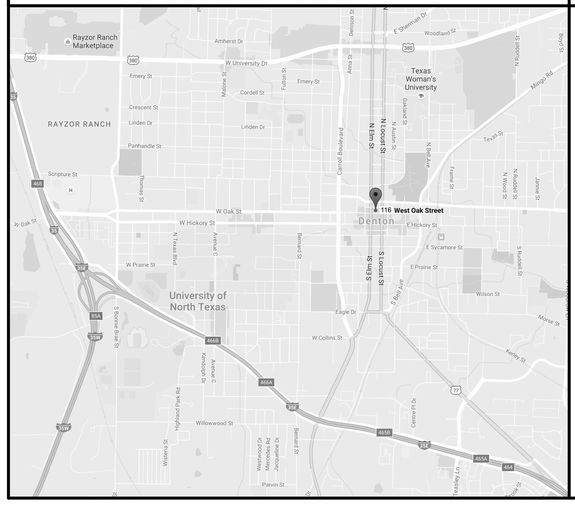
22. GENERAL CONTRACTOR IS TO PAY FOR ALL MATERIALS TESTING AND H.V.A.C. TESTING AND BALANCING. THESE ARE TO INDEPENDENT AGENCIES.

23. CONTRACTOR IS TO POWER WASH SPRAY CLEAN ALL EXISTING SIDEWALKS AND CURBS TO REMAIN.

24. UPON COMPLETION OF THE PROJECT, CONTRACTORS IS TO CLEAN ALL NEW AND EXISTING CONSTRUCTION SHOWN TO REMAIN.

25. ALL GENERAL NOTES APPLY TO ALL SHEETS.

LOCATION MAP


Rayzor Ranch Marketplace
Amherst Dr
W University Dr
Emery St
Cordell St
Crescent St
Linden Dr
Panhandle St
Scripture St
RAYZOR RANCH
Texas Woman's University
Carroll Boulevard
N Locust St
N Elm St
W Oak St
W Hickory St
E Hickory St
116 West Oak Street
Denton
E Sycamore St
W Prairie St
E Prairie St
S Locust St
S Elm St
University of North Texas
Eagle Dr
W Collins St
Wilson St
Willowwood St
Highland Park Rd
Parvin St
Woodland St
Mingo Rd
Texas St
Monroe St
Locust St
Elm St
Bonnie Brae St
Avenue C
Bernard St
Malone St
Jagoe St
Cemetery Rd
Kerley St
Morse St
Mayhill Rd
Sherman Dr
Denson Dr
Avery Dr
Fulton St
Malone St
Jackson St
Kings Rd
Kendolph St
Westwood Dr
Meadowood Dr
Jacqueline St
Wilshire St
Bell Ave
Ruddell St
Stuart Dr
Hickory St
Locust St
Elm St
Avenue C
Bernard St
Bonnie Brae St
Malone St
Jagoe St
Cemetery Rd
Kerley St
Morse St
Wilson St
Eagle Dr
Willowwood St
Highland Park Rd
Parvin St
Kingsley Ln
Bell Ave
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288A
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114A
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114A
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CHAPTER 3: BUILDING BLOCKS

302 Floor or Ground Surfaces

302.2 Carpet. Carpet or carpet tile shall be securely attached and shall have a firm cushion, pad, or backing or no cushion or pad. Carpet or carpet tile shall have a level loop, textured loop, level cut pile, or level cut/uncut pile texture.

Pile height shall be 1/2 inch (13 mm) maximum. Exposed edges of carpet shall be fastened to floor surfaces and shall have trim on the entire length of the exposed exposed edge. Carpet edge trim shall comply with 303.

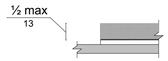

Figure 302.2 Carpet Pile Height

302.3 Openings. Openings in floor or ground surfaces shall not allow passage of a sphere more than 1/2 inch (13 mm) diameter except as allowed in 407.4.3, 409.4.3, 410.4, 810.5.3 and 810.10. Elongated openings shall be placed so that the long dimension is perpendicular to the dominant direction of travel.

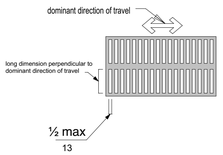

Figure 302.3 Elongated Openings in Floor or Ground Surfaces

303.2 Vertical. Changes in level of 1/4 inch (6.4 mm) high maximum shall be permitted to be vertical.

Figure 303.2 Vertical Change in Level

303.3 Beveled. Changes in level between 1/4 inch (6.4 mm) high minimum and 1/2 inch (13 mm) high maximum shall be beveled with a slope not steeper than 1:2.

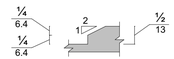

Figure 303.3 Beveled Change in Level

304 Turning Space

304.3.1 Circular Space. The turning space shall be a space of 60 inches (1525 mm) diameter minimum. The space shall be permitted to include knee and toe clearance complying with 306.

304.3.2 T-Shaped Space. The turning space shall be a T-shaped space within a 60 inch (1525 mm) square minimum with arms and base 36 inches (915 mm) wide minimum. Each arm of the T shall be clear of obstructions 12 inches (305 mm) minimum in each direction and the base shall be clear of obstructions 24 inches (610 mm) minimum. The space shall be permitted to include knee and toe clearance complying with 306 only at the end of either the base or one arm.

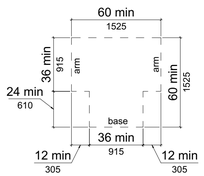

Figure 304.3.2 T-Shaped Turning Space

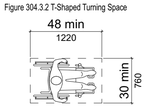

Figure 305.3 Clear Floor or Ground Space

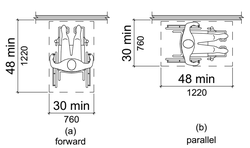

Figure 305.5 Position of Clear Floor or Ground Space

305.7.1 Forward Approach. Alcoves shall be 36 inches (915 mm)wide minimum where the depth exceeds 24 inches (610 mm).

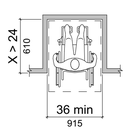

Figure 305.7.1 Maneuvering Clearance in an Alcove, Forward Approach

305.7.2 Parallel Approach. Alcoves shall be 60 inches (1525 mm) wide minimum where the depth exceeds 15 inches (380 mm).

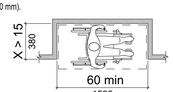

Figure 305.7.2 Maneuvering Clearance in an Alcove, Parallel Approach

306 Knee and Toe Clearance

306.2 Toe Clearance.

306.2.1 General. Space under an element between the finish floor or ground and 9 inches (230 mm) above the finish floor or ground shall be considered toe clearance and shall comply with 306.2.

306.2.2 Maximum Depth. Toe clearance shall extend 25 inches (635 mm) maximum under an element.

306.2.3 Minimum Required Depth. Where toe clearance is required at an element as part of a clear floor space, the toe clearance shall extend 17 inches (430 mm) minimum under the element.

306.2.4 Additional Clearance. Space extending greater than 6 inches (150 mm) beyond the available knee clearance at 9 inches (230 mm) above the finish floor or ground shall not be considered toe clearance.

306.2.5 Width. Toe clearance shall be 30 inches (760 mm) wide minimum.

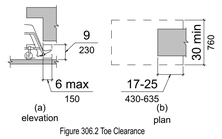

Figure 306.2 Toe Clearance

306.3 Knee Clearance.

306.3.1 General. Space under an element between 9 inches (230 mm) and 27 inches (685 mm) above the finish floor or ground shall be considered knee clearance and shall comply with 306.3.

306.3.2 Maximum Depth. Knee clearance shall extend 25 inches (635 mm) maximum under an element at 9 inches (230 mm) above the finish floor or ground.

306.3.3 Minimum Required Depth. Where knee clearance is required under an element as part of a clear floor space, the knee clearance shall be 11 inches (280 mm) deep minimum at 9 inches (230 mm) above the finish floor or ground, and 8 inches (205 mm) deep minimum at 27 inches (685 mm) above the finish floor or ground.

306.3.4 Clearance Reduction. Between 9 inches (230 mm) and 27 inches (685 mm) above the finish floor or ground, the knee clearance shall be permitted to reduce at a rate of 1 inch (25 mm) in depth for each 6 inches (150 mm) in height.

306.3.5 Width. Knee clearance shall be 30 inches (760 mm) wide minimum.

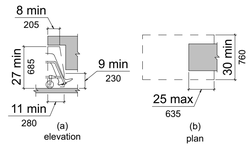

Figure 306.3 Knee Clearance

307 Protruding Objects

307.2 Protrusion Limits. Objects with leading edges more than 27 inches (685 mm) and not more than 80 inches (2030 mm) above the finish floor or ground shall protrude 4 inches (100 mm) maximum horizontally into the circulation path.

EXCEPTION: Handrails shall be permitted to protrude 4 1/2 inches (115 mm) maximum.

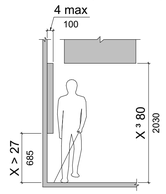

Figure 307.2 Limits of Protruding Objects

307.3 Post-Mounted Objects. Free-standing objects mounted on posts or pylons shall overhang circulation paths 12 inches (305 mm) maximum when located 27 inches (685 mm) minimum and 80 inches (2030 mm) maximum above the finish floor or ground. Where a sign or other obstruction is mounted between posts or pylons and the clear distance between the posts or pylons is greater than 12 inches (305 mm), the lowest edge of such sign or obstruction shall be 27 inches (685 mm) maximum or 80 inches (2030 mm) minimum above the finish floor or ground.

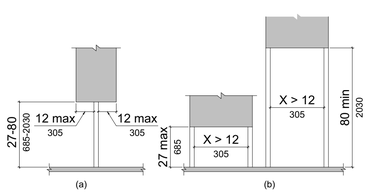

Figure 307.3 Post-Mounted Protruding Objects

307.4 Vertical Clearance. Vertical clearance shall be 80 inches (2030 mm) high minimum. Guardrails or other barriers shall be provided where the vertical clearance is less than 80 inches (2030 mm) high. The leading edge of such guardrail or barrier shall be located 27 inches (685 mm) maximum above the finish floor or ground.

EXCEPTION: Door closers and door stops shall be permitted to be 78 inches (1980 mm) minimum above the finish floor or ground.

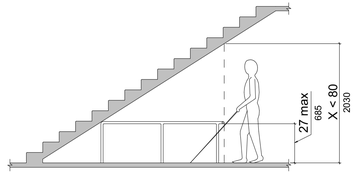

Figure 307.4 Vertical Clearance

308 Reach Ranges

Children's Reach Ranges

Forward or Side Reach	High (maximum)	Low (minimum)
Ages 3 and 4	36 in (915 mm)	20 in (510 mm)
Ages 5 through 8	40 in (1015 mm)	18 in (455 mm)
Ages 9 through 12	44 in (1120 mm)	16 in (405 mm)

308.2 Forward Reach.

308.2.1 Unobstructed. Where a forward reach is unobstructed, the high forward reach shall be 48 inches (1220 mm) maximum and the low forward reach shall be 15 inches (380 mm) minimum above the finish floor or ground.

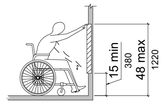

Figure 308.2.2 Obstructed High Forward Reach

308.2.2 Obstructed High Reach. Where a high forward reach is over an obstruction, the clear floor space shall extend beneath the element for a distance not less than the required reach depth over the obstruction. The high forward reach shall be 48 inches (1220 mm) maximum where the reach depth is 20 inches (510 mm) maximum. Where the reach depth exceeds 20 inches (510 mm), the high forward reach shall be 44 inches (1120 mm) maximum and the reach depth shall be 25 inches (635 mm) maximum.

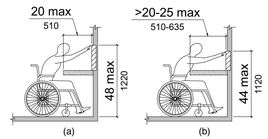

Figure 308.3.1 Unobstructed Side Reach

308.3 Side Reach.

308.3.1 Unobstructed. Where a clear floor or ground space allows a parallel approach to an element and the side reach is unobstructed, the high side reach shall be 48 inches (1220 mm) maximum and the low side reach shall be 15 inches (380 mm) minimum above the finish floor or ground.

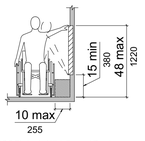

Figure 308.2.2 Obstructed High Forward Reach

308.3.2 Obstructed High Reach. Where a clear floor or ground space allows a parallel approach to an element and the high side reach is over an obstruction, the height of the obstruction shall be 34 inches (865 mm) maximum and the depth of the obstruction shall be 24 inches (610 mm) maximum. The high side reach shall be 48 inches (1220 mm) maximum for a reach depth of 10 inches (255 mm) maximum. Where the reach depth exceeds 10 inches (255 mm), the high side reach shall be 46 inches (1170 mm) maximum for a reach depth of 24 inches (610 mm) maximum.

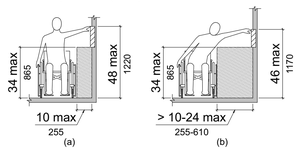

Figure 308.3.2 Obstructed High Side Reach

309 Operable Parts

309.2 Clear Floor Space. A clear floor or ground space complying with 305 shall be provided.

309.3 Height. Operable parts shall be placed within one or more of the reach ranges specified in 308.

309.4 Operation. Operable parts shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate operable parts shall be 5 pounds (22.2 N) maximum.

CHAPTER 4: ACCESSIBLE ROUTES

402.2 Components. Accessible routes shall consist of one or more of the following components: walking surfaces with a running slope not steeper than 1:20, doorways, ramps, curb ramps excluding the flared sides, elevators, and platform lifts. All components of an accessible route shall comply with the applicable requirements of Chapter 4.

Advisory 402.2 Components. Walking surfaces must have running slopes not steeper than 1:20, see 403.3. Other components of accessible routes, such as ramps (405) and curb ramps (406), are permitted to be more steeply sloped.

403 Walking Surfaces

403.1 General. Walking surfaces that are a part of an accessible route shall comply with 403.

403.2 Floor or Ground Surface. Floor or ground surfaces shall comply with 302.

403.3 Slope. The running slope of walking surfaces shall not be steeper than 1:20. The cross slope of walking surfaces shall not be steeper than 1:48.

403.4 Changes in Level. Changes in level shall comply with 303.

403.5 Clearances. Walking surfaces shall provide clearances complying with 403.5.

EXCEPTION: Within employee work areas, clearances on common use circulation paths shall be permitted to be decreased by work area equipment provided that the decrease is essential to the function of the work being performed.

403.5.1 Clear Width. Except as provided in 403.5.2 and 403.5.3, the clear width of walking surfaces shall be 36 inches (915 mm) minimum.

EXCEPTION: The clear width shall be permitted to be reduced to 32 inches (815 mm) minimum for a length of 24 inches (610 mm) maximum provided that reduced width segments are separated by segments that are 48 inches (1220 mm) long minimum and 36 inches (915 mm) wide minimum.

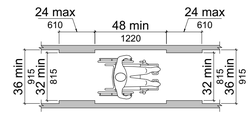

Figure 403.5.1 Clear Width of an Accessible Route

403.5.2 Clear Width at Turn. Where the accessible route makes a 180 degree turn around an element which is less than 48 inches (1220 mm) wide, clear width shall be 42 inches (1065 mm) minimum approaching the turn, 48 inches (1220 mm) minimum at the turn and 42 inches (1065 mm) minimum leaving the turn.

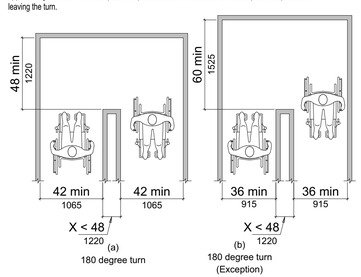

Figure 403.5.2 Clear Width at Turn

403.5.3 Passing Spaces. An accessible route with a clear width less than 60 inches (1525 mm) shall provide passing spaces at intervals of 200 feet (61 m) maximum.

404 Doors, Doorways, and Gates

404.2.3 Clear Width. Door openings shall provide a clear width of 32 inches (815 mm) minimum. Clear openings of doorways with swinging doors shall be measured between the face of the door and the stop, with the door open 90 degrees. Openings more than 24 inches (610 mm) deep shall provide a clear opening of 36 inches (915 mm) minimum. There shall be no projections into the required clear opening width lower than 34 inches (865 mm) above the finish floor or ground. Projections into the clear opening width between 34 inches (865 mm) and 80 inches (2030 mm) above the finish floor or ground shall not exceed 4 inches (100 mm).

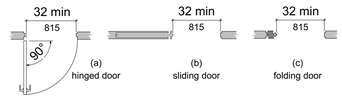

Figure 404.2.3 Clear Width of Doorways

404.2.4 Maneuvering Clearances. Minimum maneuvering clearances at doors and gates shall comply with 404.2.4. Maneuvering clearances shall extend the full width of the doorway and the required latch side or hinge side clearance.

404.2.4.3 Recessed Doors and Gates. Maneuvering clearances for forward approach shall be provided when any obstruction within 18 inches (455 mm) of the latch side of a doorway projects more than 8 inches (205 mm) beyond the face of the door, measured perpendicular to the face of the door or gate.

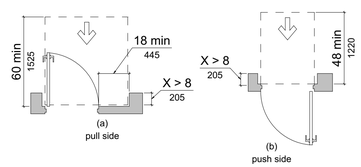

Figure 404.2.4.3 Maneuvering Clearances at Recessed Doors and Gates

404.2.6 Doors in Series and Gates in Series. The distance between two hinged or pivoted doors in series and gates in series shall be 48 inches (1220 mm) minimum plus the width of doors or gates swinging into the space.

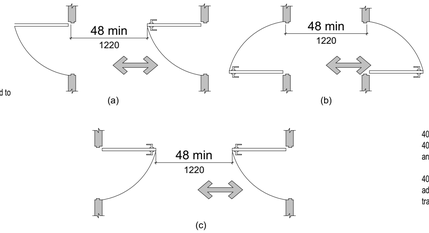

Figure 404.2.6 Doors in Series and Gates in Series

404.2.7 Door and Gate Hardware. Handles, pulls, latches, locks, and other operable parts on doors and gates shall comply with 309.4. Operable parts of such hardware shall be 34 inches (865 mm) minimum and 48 inches (1220 mm) maximum above the finish floor or ground. Where sliding doors are in the fully open position, operating hardware shall be exposed and usable from both sides.

404.2.8.1 Door Closers and Gate Closers. Door closers and gate closers shall be adjusted so that from an open position of 90 degrees, the time required to move the door to a position of 12 degrees from the latch is 5 seconds minimum.

404.2.8.2 Spring Hinges. Door and gate spring hinges shall be adjusted so that from the open position of 70 degrees, the door or gate shall move to the closed position in 1.5 seconds minimum.

404.2.9 Door and Gate Opening Force. Fire doors shall have a minimum opening force allowable by the appropriate administrative authority. The force for pushing or pulling open a door or gate other than fire doors shall be as follows:

1. Interior hinged doors and gates: 5 pounds (22.2 N) maximum.

2. Sliding or folding doors: 5 pounds (22.2 N) maximum.

These forces do not apply to the force required to retract latch bolts or disengage other devices that hold the door or gate in a closed position.

404.2.10 Door and Gate Surfaces. Swinging door and gate surfaces within 10 inches (255 mm) of the finish floor or ground measured vertically shall have a smooth surface on the push side extending the full width of the door or gate. Parts creating horizontal or vertical joints in these surfaces shall be within 1/16 inch (1.6 mm) of the same plane as the other. Cavities created by added kick plates shall be capped.

404.2.11 Vision Lights. Doors, gates, and side lights adjacent to doors or gates, containing one or more glazing panels that permit viewing through the panels shall have the bottom of at least one glazed panel located 43 inches (1090 mm) maximum above the finish floor.

404.3 Automatic and Power-Assisted Doors and Gates. Automatic doors and automatic gates shall comply with 404.3. Full-powered automatic doors shall comply with ANSI/BHMA A156.10 (incorporated by reference, see "Referenced Standards" in Chapter 1). Low-energy and power-assisted doors shall comply with ANSI/BHMA A156.19 (1997 or 2002 edition) (incorporated by reference, see "Referenced Standards" in Chapter 1).

404.3.2 Maneuvering Clearance. Clearances at power-assisted doors and gates shall comply with 404.2.4. Clearances at automatic doors and gates without standby power and serving an accessible means of egress shall comply with 404.2.4.

404.3.7 Revolving Doors, Revolving Gates, and Turnstiles. Revolving doors, revolving gates, and turnstiles shall not be part of an accessible route.

405 Ramps

405.2 Slope. Ramp runs shall have a running slope not steeper than 1:12.

405.3 Cross Slope. Cross slope of ramp runs shall not be steeper than 1:48.

405.5 Clear Width. The clear width of a ramp run and, where handrails are provided, the clear width between handrails shall be 36 inches (915 mm) minimum.

405.6 Rise. The rise for any ramp run shall be 30 inches (760 mm) maximum.

405.7 Landings. Ramps shall have landings at the top and the bottom of each ramp run. Landings shall comply with 405.7.

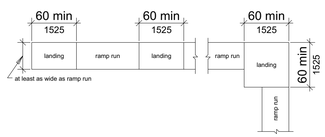

Figure 405.7 Ramp Landings

405.7.1 Slope. Landings shall have slope no steeper than 1:48. Changes in level are not permitted.

405.7.2 Width. The landing clear width shall be at least as wide as the widest ramp run leading to the landing.

405.7.3 Length. The landing clear length shall be 60 inches (1525 mm) long minimum.

405.7.4 Change in Direction. Ramps that change direction between runs at landings shall have a clear landing 60 inches (1525 mm) minimum by 60 inches (1525 mm) minimum.

405.7.5 Doorways. Where doorways are located adjacent to a ramp landing, maneuvering clearances required by 404.2.4 and 404.3.2 shall be permitted to overlap the required landing

405.8 Handrails. Ramp runs with a rise greater than 6 inches (150 mm) shall have handrails complying with 505.

405.9 Edge Protection. Edge protection complying with 405.9.1 or 405.9.2 shall be provided on each side of ramp runs and at each side of ramp landings.

405.9.1 Extended Floor or Ground Surface. The floor or ground surface of the ramp run or landing shall extend 12 inches (305 mm) minimum beyond the inside face of a handrail complying with 505.

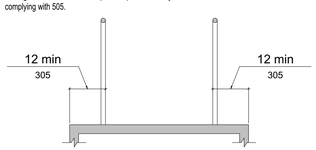

Figure 405.9.1 Extended Floor or Ground Surface Edge Protection

405.9.2 Curb or Barrier. A curb or barrier shall be provided that prevents the passage of a 4 inch (100 mm) diameter sphere, where any portion of the sphere is within 4 inches (100 mm) of the finish floor or ground surface.

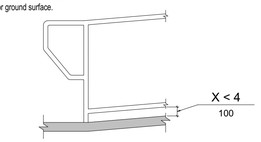

Figure 405.9.2 Curb or Barrier Edge Protection

406 Curb Ramps

406.1 General. Curb ramps on accessible routes shall comply with 406, 405.2 through 405.5, and 405.10.

406.2 Counter Slope. Counter slopes of adjoining gutters and road surfaces immediately adjacent to the curb ramp shall not be steeper than 1:20. The adjacent surfaces at transitions at curb ramps to walks, gutters, and streets shall be at the same level.

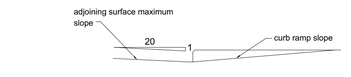

Figure 406.2 Counter Slope of Surfaces Adjacent to Curb Ramps

406.3 Sides of Curb Ramps. Where provided, curb ramp flares shall not be steeper than 1:10.

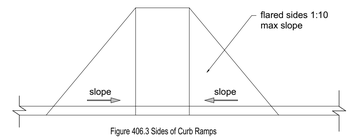

Figure 406.3 Sides of Curb Ramps

406.4 Landings. Landings shall be provided at the tops of curb ramps. The landing clear length shall be 36 inches (915 mm) minimum. The landing clear width shall be at least as wide as the curb ramp, excluding flared sides, leading to the landing.

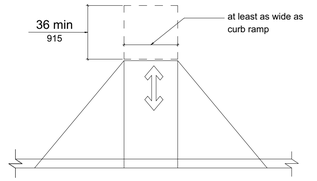

Figure 406.4 Landings at the Top of Curb Ramps

406.5 Location. Curb ramps and the flared sides of curb ramps shall be located so that they do not project into vehicular traffic lanes, parking spaces, or parking access aisles. Curb ramps at marked crossings shall be wholly contained within the markings, excluding any flared sides.

406.6 Diagonal Curb Ramps. Diagonal or corner type curb ramps with returned curbs or other well-defined edges shall have the edges parallel to the direction of pedestrian flow. The bottom of diagonal curb ramps shall have a clear space 48 inches (1220 mm) minimum outside active traffic lanes of the roadway. Diagonal curb ramps provided at marked crossings shall provide the 48 inches (1220 mm) minimum clear space within the markings. Diagonal curb ramps with flared sides shall have a segment of curb 24 inches (610 mm) long minimum located on each side of the curb ramp and within the marked crossing.

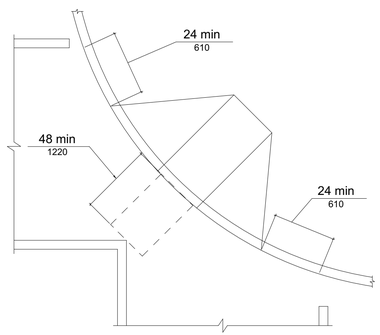

Figure 406.6 Diagonal or Corner Type Curb Ramps

406.7 Islands. Raised islands in crossings shall be cut through level with the street or have curb ramps at both sides. Each curb ramp shall have a level area 48 inches (1220 mm) long minimum by 36 inches (915 mm) wide minimum at the top of the curb ramp in the part of the island intersected by the crossings. Each 48 inch (1220 mm) minimum by 36 inch (915 mm) minimum area shall be oriented so that the 48 inch (1220 mm) minimum length is in the direction of the running slope of the curb ramp it serves. The 48 inch (1220 mm) minimum by 36 inch (915 mm) minimum areas and the accessible route shall be permitted to overlap.

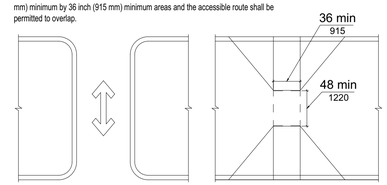

Figure 406.7 Islands in Crossings

These plans are intended to provide the basic construction information necessary to successfully construct the project described herein. These plans have been prepared and checked by the builder or person in authority of this project. Any discrepancy, error, and/ or omissions, if any, are to be brought to the attention of the Designer prior to any construction. The Designer shall not be responsible for any errors, omissions, or discrepancies in these construction documents which may conflict with same, the Builder assumes full responsibility for verifying all conditions and dimensions. THESE PLANS ARE STRICTLY COPYRIGHTED AND SHALL REMAIN THE PROPERTY OF WILLIAM PECK & ASSOCIATES, INC. AND ARE NOT TO BE TRACED, REUSED OR REPRODUCED IN ANY MANNER WITHOUT THE EXPRESSED WRITTEN PERMISSION OF WILLIAM PECK & ASSOCIATES, INC. ALL RIGHTS RESERVED

REGISTERED ARCHITECT
WILLIAM C. PECK
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STATE OF TEXAS
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REVISIONS
DATE

ACCESSIBILITY NOTES

ISSUE DATE:

Scale: REF. PLAN
Drawn: JB
Job: 19-057-001
Sheet Number: A-002

407 Elevators

407.1 General. Elevators shall comply with 407 and with ASME A17.1 (incorporated by reference, see "Referenced Standards" in Chapter 1). They shall be passenger elevators as classified by ASME A17.1. Elevator operation shall be automatic.

EXCEPTION: Existing conditions don't have to comply

407.2.1.2 Size. Call buttons shall be 3/4 inch (19 mm) minimum in the smallest dimension.

407.2.2.1 Visible and Audible Signals. A visible and audible signal shall be provided at each hoistway entrance to indicate which car is answering a call and the car's direction of travel. Where in-car signals are provided, they shall be visible from the floor area adjacent to the hall call buttons.

407.2.2.2 Visible Signals. Visible signal fixtures shall be centered at 72 inches (1830 mm) minimum above the finish floor or ground. The visible signal elements shall be 2 1/2 inches (64 mm) minimum measured along the vertical centerline of the element. Signals shall be visible from the floor area adjacent to the hall call button.

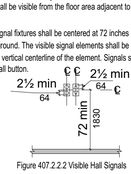


Figure 407.2.2.2 Visible Hall Signals

407.2.3.1 Floor Designation. Floor designations complying with 703.2 and 703.4.1 shall be provided on both jambs of elevator hoistway entrances. Floor designations shall be provided in both tactile characters and braille. Tactile characters shall be 2 inches (51 mm) high minimum. A tactile star shall be provided on both jambs at the main entry level.

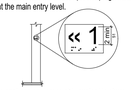


Figure 407.2.3.1 Floor Designations on Jambs of Elevator Hoistway Entrances

407.2.3.2 Car Designations. Destination-oriented elevators shall provide tactile car identification complying with 703.2 on both jambs of the hoistway immediately below the floor designation. Car designations shall be provided in both tactile characters and braille. Tactile characters shall be 2 inches (51 mm) high minimum.

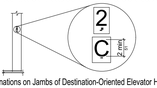


Figure 407.2.3.2 Car Designations on Jambs of Destination-Oriented Elevator Hoistway Entrances

407.3.3.1 Height. The device shall be activated by sensing an obstruction passing through the opening at 5 inches (125 mm) nominal and 29 inches (735 mm) nominal above the finish floor.

407.3.3.3 Duration. Door reopening devices shall remain effective for 20 seconds minimum.

407.3.4 Door and Signal Timing. The minimum acceptable time from notification that a car is answering a call or notification of the car assigned at the means for the entry of destination information until the doors of that car start to close shall be calculated from the following equation:

T = D/(1.5 ft/s) or T = D/(455 mm/s) + 5 seconds minimum where T equals the total time in seconds and D equals the distance (in feet or millimeters) from the point in the lobby or corridor 60 inches (1525 mm) directly in front of the farthest call button controlling that car to the centerline of its hoistway door.

407.3.5 Door Delay. Elevator doors shall remain fully open in response to a car call for 3 seconds

407.3.6 Width. The width of elevator doors shall comply with Table 407.4.1.

407.4 Elevator Car Requirements. Elevator cars shall comply with 407.4.

407.4.1 Car Dimensions. Inside dimensions of elevator cars and clear width of elevator doors shall comply with Table 407.4.1.

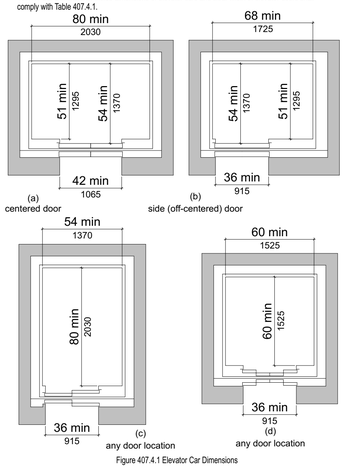


Figure 407.4.1 Elevator Car Dimensions

407.4.3 Platform to Hoistway Clearance. The clearance between the car platform sill and the edge of any hoistway landing shall be 1 1/4 inch (32 mm) maximum.

407.4.4 Leveling. Each car shall be equipped with a self-leveling feature that will automatically bring and maintain the car at floor landings within a tolerance of 1/2 inch (13 mm) under rated loading to zero loading conditions.

407.4.5 Illumination. The level of illumination at the car controls, platform, car threshold and car landing sill shall be 5 foot candles (54 lux) minimum.

407.4.6 Elevator Car Controls. Where provided, elevator car controls shall comply with 407.4.6 and 309.4.

407.4.6.1 Location. Controls shall be located within one of the reach ranges specified in 308.

407.4.6.2 Buttons. Car control buttons with floor designations shall comply with 407.4.6.2 and shall be raised or flush.

407.4.6.2.1 Size. Buttons shall be 3/4 inch (19 mm) minimum in their smallest dimension.

407.4.6.4.1 Height. Emergency control buttons shall have their centerlines 35 inches (890 mm) minimum above the finish floor.

407.4.7.1.1 Type. Control buttons shall be identified by tactile characters complying with 703.2.

407.4.7.1.3 Symbols. The control button for the emergency stop, alarm, door open, door close, main entry floor, and phone, shall be identified with tactile symbols as shown in Table 407.4.7.1.3.

407.4.8.1.1 Size. Characters shall be 1/2 inch (13 mm) high minimum.

407.4.8.2.2 Signal Level. The verbal annunciator shall be 10 dB minimum above ambient, but shall not exceed 80 dB, measured at the annunciator.

407.4.8.2.3 Frequency. The verbal annunciator shall have a frequency of 300 Hz minimum to 3000 Hz maximum.

408 Limited-Use/Limited-Application Elevators

408.1 General. Limited-use/limited-application elevators shall comply with 408 and with ASME A17.1 (incorporated by reference, see "Referenced Standards" in Chapter 1). They shall be passenger elevators as classified by ASME A17.1. Elevator operation shall be automatic.

408.2 Elevator Landings. Landings serving limited-use/limited-application elevators shall comply with 408.2.

408.2.1 Call Buttons. Elevator call buttons and keypads shall comply with 407.2.1.

408.2.2 Hall Signals. Hall signals shall comply with 407.2.2.

408.2.3 Hoistway Signs. Signs at elevator hoistways shall comply with 407.2.3.1.

408.3 Elevator Doors. Elevator hoistway doors shall comply with 408.3.

408.3.1 Sliding Doors. Sliding hoistway and car doors shall comply with 407.3.1 through 407.3.3 and 408.4.1.

408.3.2 Swinging Doors. Swinging hoistway doors shall open and close automatically and shall comply with 404, 407.3.2 and 408.3.2.

408.3.2.1 Power Operation. Swinging doors shall be power-operated and shall comply with ANSI/BHMA A156.19 (1997 or 2002 edition) (incorporated by reference, see "Referenced Standards" in Chapter 1).

408.3.2.2 Duration. Power-operated swinging doors shall remain open for 20 seconds minimum when activated.

408.4 Elevator Cars. Elevator cars shall comply with 408.4.

408.4.1 Car Dimensions and Doors. Elevator cars shall provide a clear width 42 inches (1065 mm) minimum and a clear depth 54 inches (1370 mm) minimum. Car doors shall be positioned at the narrow ends of cars and shall provide 32 inches (815 mm) minimum clear width.

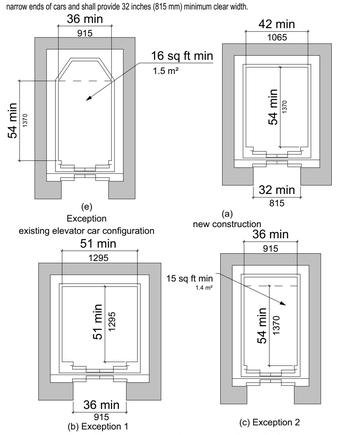


Figure 408.4.1 Limited-Use/Limited-Application (LULA) Elevator Car Dimensions

408.4.2 Floor Surfaces. Floor surfaces in elevator cars shall comply with 302 and 303.

408.4.3 Platform to Hoistway Clearance. The platform to hoistway clearance shall comply with 407.4.3.

408.4.4 Leveling. Elevator car leveling shall comply with 407.4.4.

408.4.5 Illumination. Elevator car illumination shall comply with 407.4.5.

408.4.6 Car Controls. Elevator car controls shall comply with 407.4.6. Control panels shall be centered on a side wall.

408.4.7 Designations and Indicators of Car Controls. Designations and indicators of car controls shall comply with 407.4.7.

408.4.8 Emergency Communications. Car emergency signaling devices complying with 407.4.9 shall be provided.

409 Private Residence Elevators

409.1 General. Private residence elevators that are provided within a residential dwelling unit required to provide mobility features complying with 809.2 through 809.4 shall comply with 409 and with ASME A17.1 (incorporated by reference, see "Referenced Standards" in Chapter 1). They shall be passenger elevators as classified by ASME A17.1. Elevator operation shall be automatic.

409.2 Call Buttons. Call buttons shall be 3/4 inch (19 mm) minimum in the smallest dimension and shall comply with 309.

409.3 Elevator Doors. Hoistway doors, car doors, and car gates shall comply with 409.3 and 404.

409.3.1 Power Operation. Elevator car and hoistway doors and gates shall be power operated and shall comply with ANSI/BHMA A156.19 (1997 or 2002 edition) (incorporated by reference, see "Referenced Standards" in Chapter 1). Power operated doors and gates shall remain open for 20 seconds minimum when activated.

409.3.2 Location. Elevator car doors or gates shall be positioned at the narrow end of the clear floor spaces required by 409.4.1.

409.4 Elevator Cars. Private residence elevator cars shall comply with 409.4.

409.4.1 Inside Dimensions of Elevator Cars. Elevator cars shall provide a clear floor space of 36 inches (915 mm) minimum by 48 inches (1220 mm) minimum and shall comply with 305.

409.4.2 Floor Surfaces. Floor surfaces in elevator cars shall comply with 302 and 303.

409.4.3 Platform to Hoistway Clearance. The clearance between the car platform and the edge of any landing sill shall be 1 1/2 inch (38 mm) maximum.

409.4.4 Leveling. Each car shall automatically stop at a floor landing within a tolerance of 1/2 inch (13 mm) under rated loading to zero loading conditions.

409.4.5 Illumination Levels. Elevator car illumination shall comply with 407.4.5.

409.4.6 Car Controls. Elevator car control buttons shall comply with 409.4.6, 309.3, 309.4, and shall be raised or flush.

409.4.6.1 Size. Control buttons shall be 3/4 inch (19 mm) minimum in their smallest dimension.

409.4.6.2 Location. Control panels shall be on a side wall, 12 inches (305 mm) minimum from any adjacent wall.

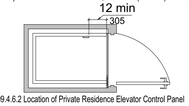


Figure 409.4.6.2 Location of Private Residence Elevator Control Panel

409.4.7 Emergency Communications. Emergency two-way communication systems shall comply with

409.4.7.1 Type. A telephone and emergency signal device shall be provided in the car.

409.4.7.2 Operable Parts. The telephone and emergency signaling device shall comply with 309.3 and 309.4.

409.4.7.3 Compartment. If the telephone or device is in a closed compartment, the compartment door hardware shall comply with 309.

409.4.7.4 Cord. The telephone cord shall be 29 inches (735 mm) long minimum.

410 Platform Lifts

410.1 General. Platform lifts shall comply with ASME A18.1 (1999 edition or 2003 edition) (incorporated by reference, see "Referenced Standards" in Chapter 1). Platform lifts shall not be attendant-operated and shall provide unassisted entry and exit from the lift.

Advisory 410.1 General. Inclined stairway chairlifts and inclined and vertical platform lifts are available for short-distance vertical transportation. Because an accessible route requires an 80 inch (2030 mm) vertical clearance, care should be taken in selecting lifts as they may not be equally suitable for use by people using wheelchairs and people standing. If a lift does not provide 80 inch (2030 mm) vertical clearance, it cannot be considered part of an accessible route in new construction.

The ADA and other Federal civil rights laws require that accessible features be maintained in working order so that they are accessible to and usable by those people they are intended to benefit. Building owners are reminded that the ASME A18 Safety Standard for Platform Lifts and Stairway Chairlifts requires routine maintenance and inspections. Isolated or temporary interruptions in service due to maintenance or repairs may be unavoidable; however, failure to take prompt action to effect repairs could constitute a violation of Federal laws and these requirements.

410.2 Floor Surfaces. Floor surfaces in platform lifts shall comply with 302 and 303.

410.3 Clear Floor Space. Clear floor space in platform lifts shall comply with 305.

410.4 Platform to Runway Clearance. The clearance between the platform sill and the edge of any runway landing shall be 1 inch (32 mm) maximum.

410.5 Operable Parts. Controls for platform lifts shall comply with 309.

410.6 Doors and Gates. Platform lifts shall have low-energy power-operated doors or gates complying with 404.3. Doors shall remain open for 20 seconds minimum. End doors and gates shall provide a clear width 32 inches (815 mm) minimum. Side doors and gates shall provide a clear width 42 inches (1065 mm) minimum.

EXCEPTION: Platform lifts serving two landings maximum and having doors or gates on opposite sides shall be permitted to have self-closing manual doors or gates.

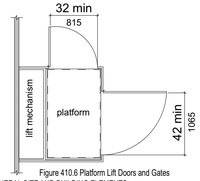


Figure 410.6 Platform Lift Doors and Gates

CHAPTER 5: GENERAL SITE AND BUILDING ELEMENTS

501 General

501.1 Scope. The provisions of Chapter 5 shall apply where required by Chapter 2 or where referenced by a requirement in this document.

502 Parking Spaces

502.1 General. Car and van parking spaces shall comply with 502. Where parking spaces are marked with lines, width measurements of parking spaces and access aisles shall be made from the centerline of the markings.

EXCEPTION: Where parking spaces or access aisles are not adjacent to another parking space or access aisle, measurements shall be permitted to include the full width of the line defining the parking space or access aisle.

502.2 Vehicle Spaces. Car parking spaces shall be 96 inches (2440 mm) wide minimum and van parking spaces shall be 132 inches (3350 mm) wide minimum, shall be marked to define the width, and shall have an adjacent access aisle complying with 502.3.

EXCEPTION: Van parking spaces shall be permitted to be 96 inches (2440 mm) wide minimum where the access aisle is 96 inches (2440 mm) wide minimum.

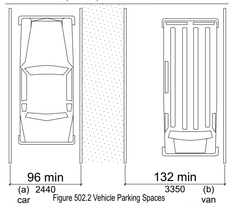


Figure 502.2 Vehicle Parking Spaces

502.3 Access Aisle. Access aisles serving parking spaces shall comply with 502.3. Access aisles shall adjoin an accessible route. Two parking spaces shall be permitted to share a common access aisle.

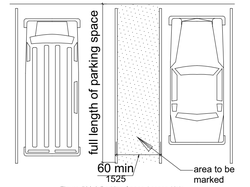


Figure 502.3 Parking Space Access Aisle

502.3.1 Width. Access aisles serving car and van parking spaces shall be 60 inches (1525 mm) wide minimum.

502.3.2 Length. Access aisles shall extend the full length of the parking spaces they serve.

502.3.3 Marking. Access aisles shall be marked so as to discourage parking in them.

502.3.4 Location. Access aisles shall not overlap the vehicular way. Access aisles shall be permitted to be placed on either side of the parking space except for angled van parking spaces which shall have access aisles located on the passenger side of the parking spaces.

502.4 Floor or Ground Surfaces. Parking spaces and access aisles serving them shall comply with 302. Access aisles shall be at the same level as the parking spaces they serve. Changes in level are not permitted. EXCEPTION: Slopes not steeper than 1:48 shall be permitted.

502.5 Vertical Clearance. Parking spaces for vans and access aisles and vehicular routes serving them shall provide a vertical clearance of 98 inches (2490 mm) minimum.

502.6 Identification. Parking space identification signs shall include the International Symbol of Accessibility complying with 703.7.2.1. Signs identifying van parking spaces shall contain the designation "van accessible." Signs shall be 60 inches (1525 mm) minimum above the finish floor or ground surface measured to the bottom of the sign.

502.7 Relationship to Accessible Routes. Parking spaces and access aisles shall be designed so that cars and vans, when parked, cannot obstruct the required clear width of adjacent accessible routes.

503 Passenger Loading Zones

503.2 Vehicle Pull-Up Space. Passenger loading zones shall provide a vehicular pull-up space 96 inches (2440 mm) wide minimum and 20 feet (6100 mm) long minimum.

503.3 Access Aisle. Passenger loading zones shall provide access aisles complying with 503 adjacent to the vehicle pull-up space. Access aisles shall adjoin an accessible route and shall not overlap the vehicular way.

503.3.1 Width. Access aisles serving vehicle pull-up spaces shall be 60 inches (1525 mm) wide minimum.

503.3.2 Length. Access aisles shall extend the full length of the vehicle pull-up spaces they serve.

503.3.3 Marking. Access aisles shall be marked so as to discourage parking in them.

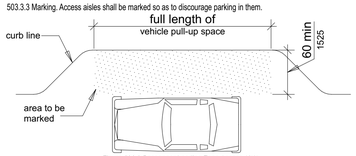


Figure 503.3 Passenger Loading Zone Access Aisle

503.4 Floor and Ground Surfaces. Vehicle pull-up spaces and access aisles serving them shall comply with 302. Access aisles shall be at the same level as the vehicle pull-up space they serve. Changes in level are not permitted. EXCEPTION: Slopes not steeper than 1:48 shall be permitted.

503.5 Vertical Clearance. Vehicle pull-up spaces, access aisles serving them, and a vehicular route from an entrance to the passenger loading zone, and from the passenger loading zone to a vehicular exit shall provide a vertical clearance of 114 inches (2895 mm) minimum.

504 Stairways

504.1 General. Stairs that are part of the means of egress is required to comply with 504

504.2 Treads and Risers. All steps on a flight of stairs shall have uniform riser heights and uniform tread depths. Risers shall be 4 inches (100 mm) high minimum and 7 inches (180 mm) high maximum. Treads shall be 11 inches (280 mm) deep minimum.

504.3 Open Risers. Open risers are not permitted.

504.4 Tread Surface. Stair treads shall comply with 302. Changes in level are not permitted.

504.5 Nosings. The radius of curvature at the leading edge of the tread shall be 1/2 inch (13 mm) maximum. Nosings that project beyond risers shall have the underside of the leading edge curved or beveled. Risers shall be permitted to slope under the tread at an angle of 30 degrees maximum from vertical. The permitted projection of the nosing shall extend 1 1/2 inches (38 mm) maximum over the tread below.

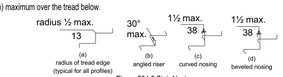


Figure 504.5 Stair Nosings

504.6 Handrails. Stairs shall have handrails complying with 505.

504.7 Wet Conditions. Stair treads and landings subject to wet conditions shall be designed to prevent the accumulation of water.

505 Handrails

505.1 General. Handrails provided along walking surfaces complying with 403, required at ramps complying with 405, and required at stairs complying with 504 shall comply with 505.

Advisory 505.1 General. Handrails are required on ramp runs with a rise greater than 6 inches (150 mm) (see 405.8) and on certain stairways (see 504). Handrails are not required on walking surfaces with running slopes less than 1:20. However, handrails are required to comply with 505 when they are provided on walking surfaces with running slopes less than 1:20 (see 403.6). Sections 505.2, 505.3, and 505.10 do not apply to handrails provided on walking surfaces with running slopes less than 1:20 as these sections only reference requirements for ramps and stairs.

505.2 Where Required. Handrails shall be provided on both sides of stairs and ramps.

505.3 Continuity. Handrails shall be continuous within the full length of each stair flight or ramp run. Inside handrails on switchback or dogleg stairs and ramps shall be continuous between flights or runs.

505.4 Height. Top of gripping surfaces of handrails shall be 34 inches (865 mm) minimum and 38 inches (965 mm) maximum vertically above walking surfaces, stair nosings, and ramp surfaces. Handrails shall be at a consistent height above walking surfaces, stair nosings, and ramp surfaces.

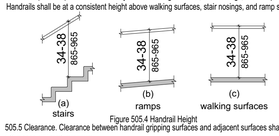


Figure 505.4 Handrail Height

505.5 Clearance. Clearance between handrail gripping surfaces and adjacent surfaces shall be 1 1/2 inches (38 mm) minimum.

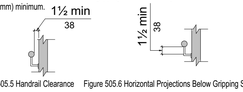


Figure 505.5 Handrail Clearance Figure 505.6 Horizontal Projections Below Gripping Surface

505.6 Gripping Surface. Handrail gripping surfaces shall be continuous along their length and shall not be obstructed along their tops or sides. The bottoms of handrail gripping surfaces shall not be obstructed for more than 20 percent of their length. Where provided, horizontal projections shall occur 1 1/2 inches (38 mm) minimum below the bottom of the handrail gripping surface.

505.7.1 Circular Cross Section. Handrail gripping surfaces with a circular cross section shall have an outside diameter of 1 1/4 inches (32 mm) minimum and 2 inches (51 mm) maximum.

505.7.2 Non-Circular Cross Sections. Handrail gripping surfaces with a non-circular cross section shall have a perimeter dimension of 4 inches (100 mm) minimum and 6 1/4 inches (160 mm) maximum, and a cross-section dimension of 2 1/4 inches (57 mm) maximum.

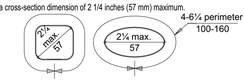


Figure 505.7.2 Handrail Non-Circular Cross Section

505.8 Surfaces. Handrail gripping surfaces and any surfaces adjacent to them shall be free of sharp or abrasive elements and shall have rounded edges.

505.9 Fittings. Handrails shall not rotate within their fittings.

505.10 Handrail Extensions. Handrail gripping surfaces shall extend beyond and in the same direction of stair flights and ramp runs in accordance with 505.10.

505.10.1 Top and Bottom Extension at Ramps. Ramp handrails shall extend horizontally above the landing for 12 inches (305 mm) minimum beyond the top and bottom of ramp runs. Extensions shall return to a wall, guard, or the landing surface, or shall be continuous to the handrail of an adjacent ramp run.

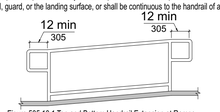


Figure 505.10.1 Top and Bottom Handrail Extension at Ramps

505.10.2 Top Extension at Stairs. At the top of a stair flight, handrails shall extend horizontally above the landing for 12 inches (305 mm) minimum beginning directly above the first riser nosing. Extensions shall return to a wall, guard, or the landing surface, or shall be continuous to the handrail of an adjacent stair flight.

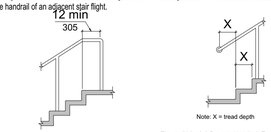


Figure 505.10.2 Top Handrail Extension at Stairs Figure 505.10.3 Bottom Handrail Extension at Stairs

505.10.3 Bottom Extension at Stairs. At the bottom of a stair flight, handrails shall extend at the slope of the stair flight for a horizontal distance at least equal to one tread depth beyond the last riser nosing. Extension shall return to a wall, guard, or the landing surface, or shall be continuous to the handrail of an adjacent stair flight.

CHAPTER 6: PLUMBING ELEMENTS AND FACILITIES

602 Drinking Fountains

602.2 Clear Floor Space. Units shall have a clear floor or ground space complying with 305 positioned for a forward approach and centered on the unit. Knee and toe clearance complying with 306 shall be provided.

EXCEPTION: A parallel approach complying with 305 shall be permitted at units for children's use where the spout is 30 inches (760 mm) maximum above the finish floor or ground and is 3 1/2 inches (90 mm) maximum from the front edge of the unit, including bumpers.

602.3 Operable Parts. Operable parts shall comply with 309.

602.4 Spout Height. Spout outlets shall be 36 inches (915 mm) maximum above the finish floor or ground.

602.5 Spout Location. The spout shall be located 15 inches (380 mm) minimum from the vertical support and 5 inches (125 mm) maximum from the front edge of the unit, including bumpers.

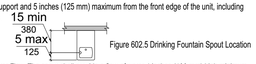


Figure 602.5 Drinking Fountain Spout Location

602.6 Water Flow. The spout shall provide a flow of water 4 inches (100 mm) high minimum and shall be located 5 inches (125 mm) maximum from the front of the unit. The angle of the water stream shall be measured horizontally relative to the front face of the unit. Where spouts are located less than 3 inches (75 mm) of the front of the unit, the angle of the water stream shall be 30 degrees maximum. Where spouts are located between 3 inches (75 mm) and 5 inches (125 mm) maximum from the front of the unit, the angle of the water stream shall be 15 degrees maximum.

602.7 Drinking Fountains for Standing Persons. Spout outlets of drinking fountains for standing persons shall be 38 inches (965 mm) minimum and 43 inches (1090 mm) maximum above the finish floor or ground.

603 Toilet and Bathing Rooms

603.2 Clearances. Clearances shall comply with 603.2.

603.2.1 Turning Space. Turning space complying with 304 shall be provided within the room.

603.2.2 Overlap. Required clear floor spaces, clearance at fixtures, and turning space shall be permitted to overlap.

603.2.3 Door Swing. Doors shall not swing into the clear floor space or clearance required for any fixture. Doors shall be permitted to swing into the required turning space.

603.3 Mirrors. Mirrors located above lavatories or countertops shall be installed with the bottom edge of the reflecting surface 40 inches (1015 mm) maximum above the finish floor or ground. Mirrors not located above lavatories or countertops shall be installed with the bottom edge of the reflecting surface 35 inches (890 mm) maximum above the finish floor or ground.

603.4 Coat Hooks and Shelves. Coat hooks shall be located within one of the reach ranges specified in 308. Shelves shall be located 40 inches (1015 mm) minimum and 48 inches (1220 mm) maximum above the finish floor.

604 Water Closets and Toilet Compartments

604.2 Location. The water closet shall be positioned with a wall or partition to the rear and to one side. The centerline of the water closet shall be 16 inches (405 mm) minimum to 18 inches (455 mm) maximum from the side wall or partition, except that the water closet shall be 17 inches (430 mm) minimum and 19 inches (485 mm) maximum from the side wall or partition in the ambulatory accessible toilet compartment specified in 604.8.2. Water closets shall be arranged for a left-hand or right-hand approach.

Figure 604.2 Water Closet Location

604.3.1 Size. Clearance around a water closet shall be 60 inches (1525 mm) minimum measured perpendicular from the side wall and 56 inches (1420 mm) minimum measured perpendicular from the rear wall.

Figure 604.3.1 Size of Clearance at Water Closet

604.3.2 Overlap. The required clearance around the water closet shall be permitted to overlap the water closet, associated grab bars, dispensers, sanitary napkin disposal units, coat hooks, shelves, accessible routes, clear floor space and clearances required at other fixtures, and the turning space. No other fixtures or obstructions shall be located within the required water closet clearance.

604.4 Seats. The seat height of a water closet above the finish floor shall be 17 inches (430 mm) minimum and 19 inches (485 mm) maximum measured to the top of the seat. Seats shall not be sprung to return to a lifted position.

604.5 Grab Bars. Grab bars for water closets shall comply with 609. Grab bars shall be provided on the side wall closest to the water closet and on the rear wall.

604.5.1 Side Wall. The side wall grab bar shall be 42 inches (1065 mm) long minimum, located 12 inches (305 mm) maximum from the rear wall and extending 54 inches (1370 mm) minimum from the rear wall.

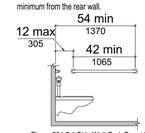


Figure 604.5.1 Side Wall Grab Bar at Water Closets Figure 604.5.2 Rear Wall Grab Bar at Water Closets

604.5.2 Rear Wall. The rear wall grab bar shall be 36 inches (915 mm) long minimum and extend from the centerline of the water closet 12 inches (305 mm) minimum on one side and 24 inches (610 mm) minimum on the other side.

604.6 Flush Controls. Flush controls shall be hand operated or automatic. Hand operated flush controls shall comply with 309. Flush controls shall be located on the open side of the water closet except in ambulatory accessible compartments complying with 604.8.2.

604.7 Dispensers. Toilet paper dispensers shall comply with 309.4 and shall be 7 inches (180 mm) minimum and 9 inches (230 mm) maximum in front of the water closet measured to the centerline of the dispenser. The outlet of the dispenser shall be 15 inches (380 mm) minimum and 48 inches (1220 mm) maximum above the finish floor and shall not be located behind grab bars. Dispensers shall not be of a type that controls delivery or that does not allow continuous paper flow.

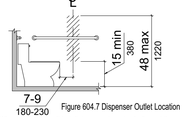


Figure 604.7 Dispenser Outlet Location

604.8 Toilet Compartments. Wheelchair accessible toilet compartments shall meet the requirements of 604.8.1 and 604.8.3. Compartments containing more than one plumbing fixture shall comply with 603. Ambulatory accessible compartments shall comply with 604.8.2 and 604.8.3.

604.8.1 Wheelchair Accessible Compartments. Wheelchair accessible compartments shall comply with 604.8.1.

604.8.1.1 Size. Wheelchair accessible compartments shall be 60 inches (1525 mm) wide minimum measured perpendicular to the side wall, and 56 inches (1420 mm) deep minimum for wall hung water closets and 59 inches (1500 mm) deep minimum for floor mounted water closets measured perpendicular to the rear wall. Wheelchair accessible compartments for children's use shall be 60 inches (1525 mm) wide minimum measured perpendicular to the side wall, and 59 inches (1500 mm) deep minimum for wall hung and floor mounted water closets measured perpendicular to the rear wall.

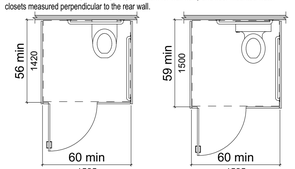


Figure 604.8.1.1 Size of Wheelchair Accessible Toilet Compartment

604.8.1.2 Doors. Toilet compartment doors, including door hardware, shall comply with 404 except that if the approach is to the latch side of the compartment door, clearance between the door side of the compartment and any obstruction shall be 42 inches (1065 mm) minimum. Doors shall be located in the front partition or in the side wall or partition farthest from the water closet. Where located in the front partition, the door opening shall be 4 inches (100 mm) minimum from the side wall or partition farthest from the water closet. Where located in the side wall or partition, the door opening shall be 4 inches (100 mm) minimum from the front partition. The door shall be self-closing. A door pull complying with 404.2.7 shall be placed on both sides of the door near the latch. Toilet compartment doors shall not swing into the minimum required compartment area.

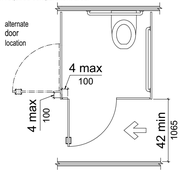


Figure 604.8.1.2 Wheelchair Accessible Toilet Compartment Doors

604.8.1.3 Approach. Compartments shall be arranged for left-hand or right-hand approach to the water closet.

604.8.1.4 Toe Clearance. The front partition and at least one side partition shall provide a toe clearance of 9 inches (230 mm) minimum above the finish floor and 6 inches (150 mm) deep minimum beyond the compartment-side face of the partition, exclusive of partition support members. Compartments for children's use shall provide a toe clearance of 12 inches (305 mm) minimum above the finish floor.

EXCEPTION: Toe clearance at the front partition is not required in a compartment greater than 62 inches (1575 mm) deep with a wall-hung water closet or 65 inches (1650 mm) deep with a floor-mounted water closet. Toe clearance at the side partition is not required in a compartment greater than 66 inches (1675 mm) wide. Toe clearance at the front partition is not required in a compartment for children's use that is greater than 65 inches (1650 mm)deep

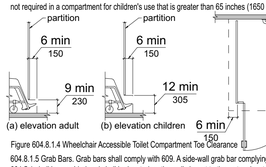


Figure 604.8.1.4 Wheelchair Accessible Toilet Compartment Toe Clearance

604.8.1.5 Grab Bars. Grab bars shall comply with 609. A side-wall grab bar complying with 604.5.1 shall be provided and shall be located on the wall closest to the water closet. In addition, a rear-wall grab bar complying with 604.5.2 shall be provided.

604.8.2 Ambulatory Accessible Compartments. Ambulatory accessible compartments shall comply with 604.8.2.

604.8.2.1 Size. Ambulatory accessible compartments shall have a depth of 60 inches (1525 mm) minimum and a width of 35 inches (890 mm) minimum and 37 inches (940 mm) maximum.

604.8.2.2 Doors. Toilet compartment doors, including door hardware, shall comply with 404, except that if the approach is to the latch side of the compartment door, clearance between the door side of the compartment and any obstruction shall be 42 inches (1065 mm) minimum. The door shall be self-closing. A door pull complying with 404.2.7 shall be placed on both sides of the door near the latch. Toilet compartment doors shall not swing into the minimum required compartment area.

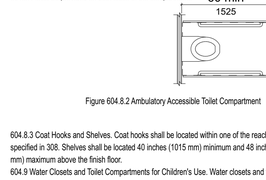


Figure 604.8.2 Ambulatory Accessible Toilet Compartment

604.8.3 Coat Hooks and Shelves. Coat hooks shall be located within one of the reach ranges specified in 308. Shelves shall be located 40 inches (1015 mm) minimum and 48 inches (1220 mm) maximum above the finish floor.

604.9 Water Closets and Toilet Compartments for Children's Use. Water closets and toilet compartments for children's use shall comply with 604.9.

604.9.1 Location. The water closet shall be located with a wall or partition to the rear and to one side. The centerline of the water closet shall be 12 inches (305 mm) minimum and 18 inches (455 mm) maximum from the side wall or partition, except that the water closet shall be 17 inches (430 mm) minimum and 19 inches (485 mm) maximum from the side wall or partition in the ambulatory accessible toilet compartment specified in 604.8.2. Compartments shall be arranged for left-hand or right-hand approach to the water closet.

604.9.2 Clearance. Clearance around a water closet shall comply with 604.3.

604.9.3 Height. The height of water closets shall be 11 inches (280 mm) minimum and 17 inches (430 mm) maximum measured to the top of the seat. Seats shall not be sprung to return to a lifted position.

604.9.4 Grab Bars. Grab bars for water closets shall comply with 604.5.

604.9.5 Flush Controls. Flush controls shall be hand operated or automatic. Hand operated flush controls shall comply with 309.2 and 309.4 and shall be installed 36 inches (915 mm) maximum above the finish floor. Flush controls shall be located on the open side of the water closet except in ambulatory accessible compartments complying with 604.8.2.

604.9.6 Dispensers. Toilet paper dispensers shall comply with 309.4 and shall be 7 inches (180 mm) minimum and 9 inches (230 mm) maximum in front of the water closet measured to the centerline of the dispenser. The outlet of the dispenser shall be 14 inches (355 mm) minimum and 19 inches (485 mm) maximum above the finish floor. There shall be a clearance of 1 1/2 inches (38 mm) minimum below the grab bar. Dispensers shall not be of a type that controls delivery or that does not allow continuous paper flow.

604.9.7 Toilet Compartments. Toilet compartments shall comply with 604.8.

605 Urinals

605.2 Height and Depth. Urinals shall be the stall-type or the wall-hung type with the rim 17 inches (430 mm) maximum above the finish floor or ground. Urinals shall be 13 1/2 inches (345 mm) deep minimum measured from the outer face of the urinal rim to the back of the fixture.

Figure 605.2 Height and Depth of Urinals

605.3 Clear Floor Space. A clear floor or ground space complying with 305 positioned for forward approach shall be provided.

605.4 Flush Controls. Flush controls shall be hand operated or automatic. Hand operated flush controls shall comply with 309.

606 Lavatories and Sinks

606.2 Clear Floor Space. A clear floor space complying with 305, positioned for a forward approach, and knee and toe clearance complying with 306 shall be provided.

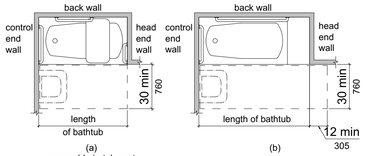
606.3 Height. Lavatories and sinks shall be installed with the front of the higher of the rim or counter surface 34 inches (865 mm) maximum above the finish floor or ground.

606.4 Faucets. Controls for faucets shall comply with 309. Hand-operated metering faucets shall remain open for 10 seconds minimum.

606.5 Exposed Pipes and Surfaces. Water supply and drain pipes under lavatories and sinks shall be insulated or otherwise configured to protect against contact. There shall be no sharp or abrasive surfaces under lavatories and sinks.

607 Bathtubs

607.2 Clearance. Clearance in front of bathtubs shall extend the length of the bathtub and shall be 30 inches (760 mm) wide minimum. A lavatory complying with 606 shall be permitted at the control end of the clearance. Where a permanent seat is provided at the head end of the bathtub, the clearance shall extend 12 inches (305 mm) minimum beyond the wall at the head end of the bathtub.


back wall
control
end
wall
head
end
wall
30 min
760
length

607.4.1.1 Back Wall. Two grab bars shall be installed on the back wall, one located in accordance with 609.4 and the other located 8 inches (205 mm) minimum and 10 inches (255 mm) maximum above the rim of the bathtub. Each grab bar shall be installed 15 inches (380 mm) maximum from the head end wall and 12 inches (305 mm) maximum from the control end wall.

607.4.1.2 Control End Wall. A grab bar 24 inches (610 mm) long minimum shall be installed on the control end wall at the front edge of the bathtub.

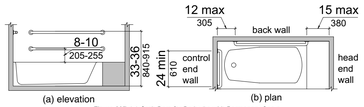


Figure 607.4.1 Grab Bars for Bathtubs with Permanent Seats

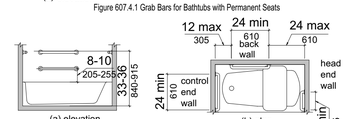


Figure 607.4.2 Grab Bars for Bathtubs with Removable In-Tub Seats

607.4.2 Bathtubs Without Permanent Seats. For bathtubs without permanent seats, grab bars shall comply with 607.4.2.

607.4.2.1 Back Wall. Two grab bars shall be installed on the back wall, one located in accordance with 609.4 and other located 8 inches (205 mm) minimum and 10 inches (255 mm) maximum above the rim of the bathtub. Each grab bar shall be 24 inches (610 mm) long minimum and shall be installed 24 inches (610 mm) maximum from the head end wall and 12 inches (305 mm) maximum from the control end wall.

607.4.2.2 Control End Wall. A grab bar 24 inches (610 mm) long minimum shall be installed on the control end wall at the front edge of the bathtub.

607.4.2.3 Head End Wall. A grab bar 12 inches (305 mm) long minimum shall be installed on the head end wall at the front edge of the bathtub.

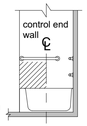


Figure 607.5 Bathtub Control Location

607.5 Controls. Controls, other than drain stoppers, shall be located on an end wall. Controls shall be between the bathtub rim and grab bar, and between the open side of the bathtub and the centerline of the width of the bathtub. Controls shall comply with 309.4.

607.6 Shower Spray Unit and Water. A shower spray unit with a hose 59 inches (1500 mm) long minimum that can be used both as a fixed-position shower head and as a hand-held shower shall be provided. The shower spray unit shall have an on/off control with a non-positive shut-off. If an adjustable-height shower head on a vertical bar is used, the bar shall be installed so as not to obstruct the use of grab bars. Bathtub shower spray units shall deliver water that is 120°F (49°C) maximum.

607.7 Bathtub Enclosures. Enclosures for bathtubs shall not obstruct controls, faucets, shower and spray units or obstruct transfer from wheelchairs onto bathtub seats or into bathtubs. Enclosures on bathtubs shall not have tracks installed on the rim of the open face of the bathtub.

608 Shower Compartments

608.2 Size and Clearances for Shower Compartments. Shower compartments shall have sizes and clearances complying with 608.2.

608.2.1 Transfer Type Shower Compartments. Transfer type shower compartments shall be 36 inches (915 mm) by 36 inches (915 mm) clear inside dimensions measured at the center points of opposing sides and shall have a 36 inch (915 mm) wide minimum entry on the face of the shower compartment. Clearance of 36 inches (915 mm) wide minimum by 48 inches (1220 mm) long minimum measured from the control wall shall be provided.

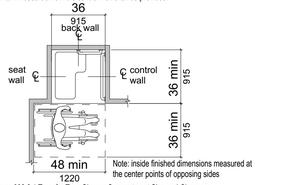


Figure 608.2.1 Transfer Type Shower Compartment Size and Clearance

608.2.2 Standard Roll-In Type Shower Compartments. Standard roll-in type shower compartments shall be 30 inches (760 mm) wide minimum by 60 inches (1525 mm) deep minimum clear inside dimensions measured at center points of opposing sides and shall have a 60 inches (1525 mm) wide minimum entry on the face of the shower compartment.

608.2.2.1 Clearance. A 30 inch (760 mm) wide minimum by 60 inch (1525 mm) long minimum clearance shall be provided adjacent to the open face of the shower compartment.

Figure 608.2.2 Standard Roll-In Type Shower Compartment Size and Clearance

608.2.3 Alternate Roll-In Type Shower Compartments. Alternate roll-in type shower compartments shall be 36 inches (915 mm) wide and 60 inches (1525 mm) deep minimum clear inside dimensions measured at center points of opposing sides. A 36 inch (915 mm) wide minimum entry shall be provided at one end of the long side of the compartment.

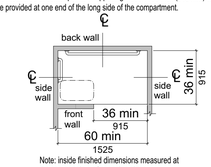


Figure 608.2.3 Alternate Roll-In Type Shower Compartment Size and Clearance

608.3 Grab Bars. Grab bars shall comply with 609 and shall be provided in accordance with 608.3. Where multiple grab bars are used, required horizontal grab bars shall be installed at the same height above the finish floor.

608.3.1 Transfer Type Shower Compartments. In transfer type compartments, grab bars shall be provided across the control wall and back wall to a point 18 inches (455 mm) from the control wall.

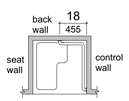


Figure 608.3.1 Grab Bars for Transfer Type Showers

608.3.2 Standard Roll-In Type Shower Compartments. Where a seat is provided in standard roll-in type shower compartments, grab bars shall be provided on the back wall and the side wall opposite the seat. Grab bars shall not be provided above the seat. Where a seat is not provided in standard roll-in type shower compartments, grab bars shall be provided on three walls. Grab bars shall be installed 6 inches (150 mm) maximum from adjacent walls.

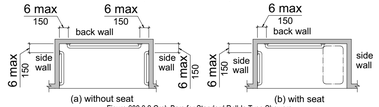


Figure 608.3.2 Grab Bars for Standard Roll-In Type Showers

608.3.3 Alternate Roll-In Type Shower Compartments. In alternate roll-in type shower compartments, grab bars shall be provided on the back wall and the side wall farthest from the compartment entry. Grab bars shall not be provided above the seat. Grab bars shall be installed 6 inches (150 mm) maximum from adjacent walls.

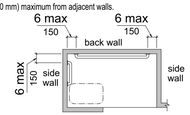


Figure 608.3.3 Grab Bars for Alternate Roll-In Type Showers

608.4 Seats. A folding or non-folding seat shall be provided in transfer type shower compartments. A folding seat shall be provided in roll-in type showers required in transient lodging guest rooms with mobility features complying with 806.2. Seats shall comply with 610.

608.5 Controls. Controls, faucets, and shower spray units shall comply with 309.4.

608.5.1 Transfer Type Shower Compartments. In transfer type shower compartments, the controls, faucets, and shower spray unit shall be installed on the side wall opposite the seat 38 inches (965 mm) minimum and 48 inches (1220 mm) maximum above the shower floor and shall be located on the control wall 15 inches (380 mm) maximum from the centerline of the seat toward the shower opening.

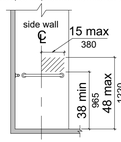


Figure 608.5.1 Transfer Type Shower Compartment Control Location

608.5.2 Standard Roll-In Type Shower Compartments. In standard roll-in type shower compartments, the controls, faucets, and shower spray unit shall be located above the grab bar, but no higher than 48 inches (1220 mm) above the shower floor. Where a seat is provided, the controls, faucets, and shower spray unit shall be installed on the back wall adjacent to the seat wall and shall be located 27 inches (685 mm) maximum from the seat wall.

Figure 608.5.2 Standard Roll-In Type Shower Compartment Control Location

608.5.3 Alternate Roll-In Type Shower Compartments. In alternate roll-in type shower bar, but no higher than 48 inches (1220 mm) above the shower floor. Where a seat is provided, the controls, faucets, and shower spray unit shall be located on the side wall shower spray unit shall be installed on the side wall farthest from the compartment entry.

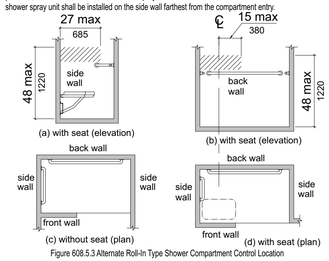


Figure 608.5.3 Alternate Roll-In Type Shower Compartment Control Location

608.6 Shower Spray Unit and Water. A shower spray unit with a hose 59 inches (1500 mm) long minimum that can be used both as a fixed-position shower head and as a hand-held shower shall be provided. The shower spray unit shall have an on/off control with a non-positive shut-off. If an adjustable-height shower head on a vertical bar is used, the bar shall be installed so as not to obstruct the use of grab bars. Shower spray units shall deliver water that is 120°F (49°C) maximum.

608.7 Thresholds. Thresholds in roll-in type shower compartments shall be 1/2 inch (13 mm) high maximum in accordance with 303. In transfer type shower compartments, thresholds 1/2 inch (13 mm) high maximum shall be beveled, rounded, or vertical.

608.8 Shower Enclosures. Enclosures for shower compartments shall not obstruct controls, faucets, and shower spray units or obstruct transfer from wheelchairs onto shower seats.

609 Grab Bars

609.1 General. Grab bars in toilet facilities and bathing facilities shall comply with 609.

609.2 Cross Section. Grab bars shall have a cross section complying with 609.2.1 or 609.2.2.

609.2.1 Circular Cross Section. Grab bars with circular cross sections shall have an outside diameter of 1 1/4 inches (32 mm) minimum and 2 inches (51 mm) maximum.

609.2.2 Non-Circular Cross Section. Grab bars with non-circular cross sections shall have a cross-section dimension of 2 inches (51 mm) maximum and a perimeter dimension of 4 inches (100 mm) minimum and 4.8 inches (120 mm) maximum.

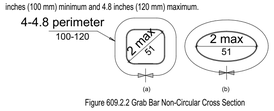


Figure 609.2.2 Grab Bar Non-Circular Cross Section

609.3 Spacing. The space between the wall and the grab bar shall be 1 1/2 inches (38 mm). The space between the grab bar and projecting objects below and at the ends shall be 1 1/2 inches (38 mm) minimum. The space between the grab bar and projecting objects above shall be 12 inches (305 mm) minimum.

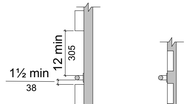


Figure 609.3 Spacing of Grab Bars

609.4 Position of Grab Bars. Grab bars shall be installed in a horizontal position, 33 inches (840 mm) minimum and 36 inches (915 mm) maximum above the finish floor measured to the top of the gripping surface, except that at water closets for children's use complying with 604.9, grab bars shall be installed in a horizontal position 18 inches (455 mm) minimum and 27 inches (685 mm) maximum above the finish floor measured to the top of the gripping surface. The height of the lower grab bar on the back wall of a bathtub shall comply with 607.4.1.1 or 607.4.2.1.

609.5 Surface Hazards. Grab bars and any wall or other surfaces adjacent to grab bars shall be free of sharp or abrasive elements and shall have rounded edges.

609.6 Fittings. Grab bars shall not rotate within their fittings.

609.7 Installation. Grab bars shall be installed in any manner that provides a gripping surface at the specified locations and that does not obstruct the required clear floor space.

609.8 Structural Strength. Allowable stresses shall not be exceeded for materials used when a vertical or horizontal force of 250 pounds (1112 N) is applied at any point on the grab bar, fastener, mounting device, or supporting structure.

610 Seats

610.2 Bathtub Seats. The top of bathtub seats shall be 17 inches (430 mm) minimum and 19 inches (485 mm) maximum above the bathroom finish floor. The depth of a removable in-tub seat shall be 15 inches (380 mm) minimum and 16 inches (405 mm) maximum. The seat shall be capable of secure placement. Permanent seats at the head end of the bathtub shall be 15 inches (380 mm) deep minimum and shall extend from the back wall to or beyond the outer edge of the bathtub.

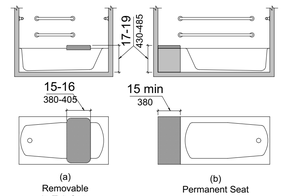


Figure 610.2 Bathtub Seats

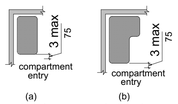


Figure 610.3 Extent of Seat

610.3 Shower Compartment Seats. Where a seat is provided in a standard roll-in shower compartment, it shall be a folding type, shall be installed on the side wall adjacent to the controls, and shall extend from the back wall to a point within 3 inches (75 mm) of the compartment entry. Where a seat is provided in an alternate roll-in type shower compartment, it shall be a folding type, shall be installed on the front wall opposite the back wall, and shall extend from the adjacent side wall to a point within 3 inches (75 mm) of the compartment entry. In transfer-type showers, the seat shall extend from the back wall to a point within 3 inches (75 mm) of the compartment entry. The top of the seat shall be 17 inches (430 mm) minimum and 19 inches (485 mm) maximum above the bathroom finish floor. Seats shall comply with 610.3.1 or 610.3.2.

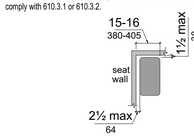


Figure 610.3.1 Rectangular Shower Seat

610.3.1 Rectangular Seats. The rear edge of a rectangular seat shall be 2 1/2 inches (64 mm) maximum and the front edge 15 inches (380 mm) minimum and 16 inches (405 mm) maximum from the seat wall. The side edge of the seat shall be 1 1/2 inches (38 mm) maximum from the adjacent wall.

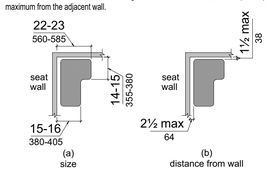


Figure 610.3.2 L-Shaped Shower Seat

610.3.2 L-Shaped Seats. The rear edge of an L-shaped seat shall be 2 1/2 inches (64 mm) maximum and the front edge 15 inches (380 mm) minimum and 16 inches (405 mm) maximum from the seat wall. The rear edge of the "L" portion of the seat shall be 1 1/2 inches (38 mm) maximum from the wall and the front edge shall be 14 inches (355 mm) minimum and 15 inches (380 mm) maximum from the wall. The end of the "L" shall be 22 inches (560 mm) minimum and 23 inches maximum (585 mm) from the main seat wall.

610.4 Structural Strength. Allowable stresses shall not be exceeded for materials used when a vertical or horizontal force of 250 pounds (1112 N) is applied at any point on the seat, fastener, mounting device, or supporting structure.

611 Washing Machines and Clothes Dryers

611.2 Clear Floor Space. A clear floor or ground space complying with 305 positioned for parallel approach shall be provided. The clear floor or ground space shall be centered on the appliance.

611.3 Operable Parts. Operable parts, including doors, lint screens, and detergent and bleach compartments shall comply with 309.

611.4 Height. Top loading machines shall have the door to the laundry compartment located 36 inches (915 mm) maximum above the finish floor. Front loading machines shall have the bottom of the opening to the laundry compartment located 15 inches (380 mm) minimum and 36 inches (915 mm) maximum above the finish floor.

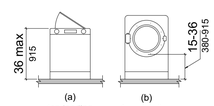


Figure 611.4 Height of Laundry Compartment Opening

612 Saunas and Steam Rooms

612.2 Bench. Where seating is provided in saunas and steam rooms, at least one bench shall comply with 903. Doors shall not swing into the clear floor space required by 903.2.

612.3 Turning Space. A turning space complying with 304 shall be provided within saunas and steam rooms

CHAPTER 7: COMMUNICATION ELEMENTS AND FEATURES

702 Fire Alarm Systems

702.1 General. Fire alarm systems shall have permanently installed audible and visible alarms complying with NFPA 72 (1999 or 2002 edition) (incorporated by reference, see "Referenced Standards" in Chapter 1), except that the maximum allowable sound level of audible notification appliances complying with section 4-3.2.1 of NFPA 72 (1999 edition) shall have a sound level no more than 110 dB at the minimum hearing distance from the audible appliance. In addition, alarms in guest rooms required to provide communication features shall comply with sections 4-3 and 4-4 of NFPA 72 (1999 edition) or sections 7.4 and 7.5 of NFPA 72 (2002 edition).

703 Signs

703.1 General. Signs shall comply with 703. Where both visual and tactile characters are required, either one sign with both visual and tactile characters, or two separate signs, one with visual, and one with tactile characters, shall be provided.

703.2 Raised Characters. Raised characters shall comply with 703.2 and shall be duplicated in braille complying with 703.3. Raised characters shall be installed in accordance with 703.4.

703.2.1 Depth. Raised characters shall be 1/32 inch (0.8 mm) minimum above their background.

703.2.2 Case. Characters shall be uppercase.

703.2.3 Style. Characters shall be sans serif. Characters shall not be italic, oblique, script, highly decorative, or of other unusual forms.

703.2.4 Character Proportions. Characters shall be selected from fonts where the width of the uppercase letter "O" is 55 percent minimum and 110 percent maximum of the height of the uppercase letter "I".

703.2.5 Character Height. Character height measured vertically from the baseline of the character shall be 5/8 inch (16 mm) minimum and 2 inches (51 mm) maximum based on the height of the uppercase letter "I".

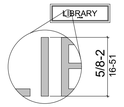


Figure 703.2.5 Height of Raised Characters

703.2.6 Stroke Thickness. Stroke thickness of the uppercase letter "I" shall be 15 percent maximum of the height of the character.

703.2.7 Character Spacing. Character spacing shall be measured between the two closest points of adjacent raised characters within a message, excluding word spaces. Where characters have rectangular cross sections, spacing between individual raised characters shall be 1/8 inch (3.2 mm) minimum and 4 times the raised character stroke width maximum. Where characters have other cross sections, spacing between individual raised characters shall be 1/16 inch (1.6 mm) minimum and 4 times the raised character stroke width maximum at the base of the cross sections, and 1/8 inch (3.2 mm) minimum and 4 times the raised character stroke width maximum at the top of the cross sections. Characters shall be separated from raised borders and decorative elements 3/8 inch (9.5 mm) minimum.

703.2.8 Line Spacing. Spacing between the baselines of separate lines of raised characters within a message shall be 135 percent minimum and 170 percent maximum of the raised character height.

703.3 Braille. Braille shall be contracted (Grade 2) and shall comply with 703.3 and 703.4.

703.3.1 Dimensions and Capitalization. Braille dots shall have a domed or rounded shape and shall comply with Table 703.3.1. The indication of an uppercase letter or letters shall only be used before the first word of sentences, proper nouns and names, individual letters of the alphabet, initials, and acronyms.

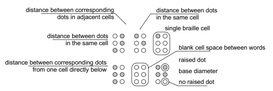


Figure 703.3.1 Braille Measurement

703.3.2 Position. Braille shall be positioned below the corresponding text. If text is multi-lined, braille shall be placed below the entire text. Braille shall be separated 3/8 inch (9.5 mm) minimum from any other tactile characters and 3/8 inch (9.5 mm) minimum from raised borders and decorative elements.

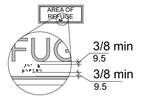


Figure 703.3.2 Position of Braille

703.4 Installation Height and Location. Signs with tactile characters shall comply with 703.4.

703.4.1 Height Above Finish Floor or Ground. Tactile characters on signs shall be located 48 inches (1220 mm) minimum above the finish floor or ground surface, measured from the baseline of the lowest tactile character and 60 inches (1525 mm) maximum above the finish floor or ground surface, measured from the baseline of the highest tactile character.

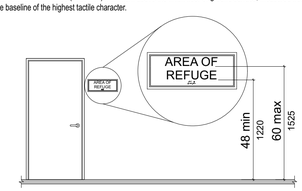


Figure 703.4.1 Height of Tactile Characters Above Finish Floor or Ground

703.4.2 Location. Where a tactile sign is provided at a door, the sign shall be located alongside the door at the latch side. Where a tactile sign is provided at double doors with one active leaf, the sign shall be located on the inactive leaf. Where a tactile sign is provided at double doors with two active leafs, the sign shall be located to the right of the right hand door. Where there is no wall space at the latch side of a single door or at the right side of double doors, signs shall be located on the nearest adjacent wall. Signs containing tactile characters shall be located so that a clear floor space of 18 inches (455 mm) minimum by 18 inches (455 mm) minimum, centered on the tactile characters, is provided beyond the arc of any door swing between the closed position and 45 degree open position.

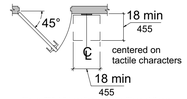


Figure 703.4.2 Location of Tactile Signs at Doors

703.5 Visual Characters. Visual characters shall comply with 703.5.

703.5.1 Finish and Contrast. Characters and their background shall have a non-glare finish. Characters shall contrast with their background with either light characters on a dark background or dark characters on a light background.

703.5.2 Case. Characters shall be uppercase or lowercase or a combination of both.

703.5.3 Style. Characters shall be conventional in form. Characters shall not be italic, oblique, script, highly decorative, or of other unusual forms.

703.5.4 Character Proportions. Characters shall be selected from fonts where the width of the uppercase letter "O" is 55 percent minimum and 110 percent maximum of the height of the uppercase letter "I".

703.5.5 Character Height. Minimum character height shall comply with Table 703.5.5. Viewing distance shall be measured as the horizontal distance between the character and an obstruction preventing further approach towards the sign. Character height shall be based on the uppercase letter "I".

703.5.6 Height From Finish Floor or Ground. Visual characters shall be 40 inches (1015 mm) minimum above the finish floor or ground.

703.5.7 Stroke Thickness. Stroke thickness of the uppercase letter "I" shall be 10 percent minimum and 30 percent maximum of the height of the character.

703.5.8 Character Spacing. Character spacing shall be measured between the two closest points of adjacent characters, excluding word spaces. Spacing between individual characters shall be 10 percent minimum and 35 percent maximum of character height.

703.5.9 Line Spacing. Spacing between the baselines of separate lines of characters within a message shall be 135 percent minimum and 170 percent maximum of the character height.

703.6 Pictograms. Pictograms shall comply with 703.6.

703.6.1 Pictogram Field. Pictograms shall have a field height of 6 inches (150 mm) minimum. Characters and braille shall not be located in the pictogram field.

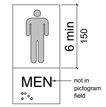


Figure 703.6.1 Pictogram Field
dark-on-light.

703.6.2 Finish and Contrast. Pictograms and their field shall have a non-glare finish. Pictograms shall contrast with their field with either a light pictogram on a dark field or a dark pictogram on a light field.

703.6.3 Text Descriptors. Pictograms shall have text descriptors located directly below the pictogram field. Text descriptors shall comply with 703.2, 703.3 and 703.4.

703.7 Symbols of Accessibility. Symbols of accessibility shall comply with 703.7.

703.7.1 Finish and Contrast. Symbols of accessibility and their background shall have a non-glare finish. Symbols of accessibility shall contrast with their background with either a light symbol on a dark background or a dark symbol on a light background.

704 Telephones

704.1 General. Public telephones shall comply with 704.

704.2 Wheelchair Accessible Telephones. Wheelchair accessible telephones shall comply with 704.2.

704.2.1 Clear Floor or Ground Space. A clear floor or ground space complying with 305 shall be provided. The clear floor or ground space shall not be obstructed by bases, enclosures, or seats.

Advisory 704.2.1 Clear Floor or Ground Space. Because clear floor and ground space is required to be unobstructed, telephones, enclosures and related telephone book storage cannot encroach on the required clear floor or ground space and must comply with the provisions for protruding objects. (See Section 307).

704.2.1.1 Parallel Approach. Where a parallel approach is provided, the distance from the edge of the telephone enclosure to the face of the telephone unit shall be 10 inches (255 mm) maximum.

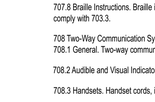


Figure 704.2.1.1 Parallel Approach to Telephone

Figure 704.2.1.2 Forward Approach to Telephone

704.2.1.2 Forward Approach. Where a forward approach is provided, the distance from the front edge of a counter within the telephone enclosure to the face of the telephone unit shall be 20 inches (510 mm) maximum.

704.2.2 Operable Parts. Operable parts shall comply with 309. Telephones shall have push-button controls where such service is available.

704.2.3 Telephone Directories. Telephone directories, where provided, shall be located in accordance with 309.

704.2.4 Cord Length. The cord from the telephone to the handset shall be 29 inches (735 mm) long minimum.

704.3 Volume Control Telephones. Public telephones required to have volume controls shall be equipped with a receive volume control that provides a gain adjustable up to 20 dB minimum. For incremental volume control, provide at least one intermediate step of 12 dB of gain minimum. An automatic reset shall be provided.

704.4 TTYs. TTYs required at a public pay telephone shall be permanently affixed within, or adjacent to, the telephone enclosure. Where an acoustic coupler is used, the telephone cord shall be sufficiently long to allow connection of the TTY and the telephone receiver.

704.4.1 Height. When in use, the touch surface of TTY keypads shall be 34 inches (865 mm) minimum above the finish floor.

704.5 TTY Shelf. Public pay telephones required to accommodate portable TTYs shall be equipped with a shelf and an electrical outlet within or adjacent to the telephone enclosure. The telephone handset shall be capable of being placed flush on the surface of the shelf. The shelf shall be capable of accommodating a TTY and shall have 6 inches (150 mm) minimum vertical clearance above the area where the TTY is to be placed.

705 Detectable Warnings

705.1 General. Detectable warnings shall consist of a surface of truncated domes and shall comply with 705.

705.1.1 Dome Size. Truncated domes in a detectable warning surface shall have a base diameter of 0.9 inch (23 mm) minimum and 1.4 inches (36 mm) maximum, a top diameter of 50 percent of the base diameter minimum to 65 percent of the base diameter maximum, and a height of 0.2 inch (5.1 mm).

705.1.2 Dome Spacing. Truncated domes in a detectable warning surface shall have a center-to-center spacing of 1.6 inches (41 mm) minimum and 2.4 inches (61 mm) maximum, and a base-to-base spacing of 0.65 inch (17 mm) minimum, measured between the most adjacent domes on a square grid.

705.1.3 Contrast. Detectable warning surfaces shall contrast visually with adjacent walking surfaces either light-on-dark, or dark-on-light.

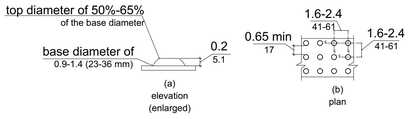


Figure 705.1 Size and Spacing of Truncated Domes

705.2 Platform Edges. Detectable warning surfaces at platform boarding edges shall be 24 inches (610 mm) wide and shall extend the full length of the public use areas of the platform.

706 Assistive Listening Systems

706.2 Receiver Jacks. Receivers required for use with an assistive listening system shall include a 1/8 inch (3.2 mm) standard mono jack.

706.3 Receiver Hearing-Aid Compatibility. Receivers required to be hearing-aid compatible shall interface with telecoils in hearing aids through the provision of neckloops.

706.4 Sound Pressure Level. Assistive listening systems shall be capable of providing a sound pressure level of 110 dB minimum and 118 dB maximum with a dynamic range on the volume control of 50 dB.

706.5 Signal-to-Noise Ratio. The signal-to-noise ratio for internally generated noise in assistive listening systems shall be 18 dB minimum.

706.6 Peak Clipping Level. Peak clipping shall not exceed 18 dB of clipping relative to the peaks of speech.

707 Automatic Teller Machines and Fare Machines

707.2 Clear Floor or Ground Space. A clear floor or ground space complying with 305 shall be provided.

707.3 Operable Parts. Operable parts shall comply with 309. Unless a clear or correct key is provided, each operable part shall be able to be differentiated by sound or touch, without activation.

EXCEPTION: Drive-up only automatic teller machines and fare machines shall not be required to comply with 309.2 and 309.3.

707.4 Privacy. Automatic teller machines shall provide the opportunity for the same degree of privacy of input and output available to all individuals.

707.5 Speech Output. Machines shall be speech enabled. Operating instructions and orientation, visible transaction prompts, user input verification, error messages, and all displayed information for full use shall be accessible to and independently usable by individuals with vision impairments. Speech shall be delivered through a mechanism that is readily available to all users, including but not limited to, an industry standard connector or a telephone handset. Speech shall be recorded or digitized human, or synthesized.

707.5.1 User Control. Speech shall be capable of being repeated or interrupted. Volume control shall be provided for the speech function.

707.5.2 Receipts. Where receipts are provided, speech output devices shall provide audible balance inquiry information, error messages, and all other information on the printed receipt necessary to complete or verify the transaction.

707.6 Input. Input devices shall comply with 707.6.

707.6.1 Input Controls. At least one tactilely discernible input control shall be provided for each function. Where provided, key surfaces not on active areas of display screens, shall be raised above surrounding surfaces. Where membrane keys are the only method of input, each shall be tactilely discernable from surrounding surfaces and adjacent keys.

707.6.2 Numeric Keys. Numeric keys shall be arranged in a 12-key ascending or descending telephone keypad layout. The number five key shall be tactilely distinct from the other keys.

707.6.3.1 Contrast. Function keys shall contrast visually from background surfaces. Characters and symbols on key surfaces shall contrast visually from key surfaces. Visual contrast shall be either light-on-dark or

707.6.3.2 Tactile Symbols. Function key surfaces shall have tactile symbols as follows: Enter or Proceed key: raised circle; Clear or Correct key: raised left arrow; Cancel key: raised letter ex; Add Value key: raised plus sign; Decrease Value key: raised minus sign.

707.7 Display Screen. The display screen shall comply with 707.7.

707.7.1 Visibility. The display screen shall be visible from a point located 40 inches (1015 mm) above the center of the clear floor space in front of the machine.

707.7.2 Characters. Characters displayed on the screen shall be in a sans serif font. Characters shall be 3/16 inch (4.8 mm) high minimum based on the uppercase letter "I". Characters shall contrast with their background with either light characters on a dark background or dark characters on a light background.

707.8 Braille Instructions. Braille instructions for initiating the speech mode shall be provided. Braille shall comply with 703.3.

708 Two-Way Communication Systems

708.1 General. Two-way communication systems shall comply with 708.

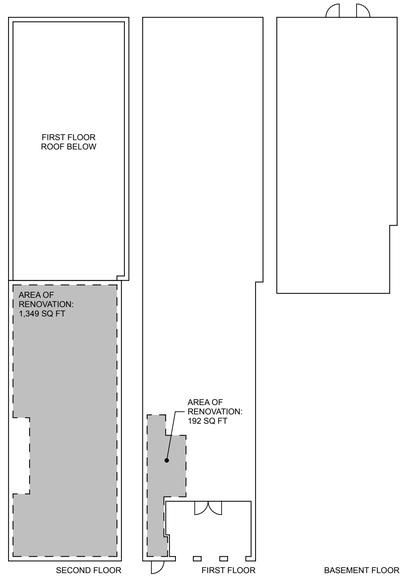
708.2 Audible and Visual Indicators. The system shall provide both audible and visual signals.

708.3 Handsets. Handset cords, if provided, shall be 29 inches (735 mm) long minimum.

708.4 Residential Dwelling Unit Communication Systems. Communications systems between a residential dwelling unit and a site, building, or floor entrance shall comply with 708.4.

708.4.1 Common Use or Public Use System Interface. The common use or public use system interface shall include the capability of supporting voice and TTY communication with the residential dwelling unit interface.

These plans are intended to provide the basic construction information necessary to successfully complete the project. Any discrepancy, error, and/or omissions found in the plans shall be brought to the attention of the Designer prior to any construction. If any are to be brought to the attention of the Designer prior to any construction. If any are to be brought to the attention of the Designer prior to any construction. If any are to



KEY PLAN

SCALE: NTS

EQUIPMENT SCHEDULE

NO.	ITEM NAME	QTY.	MANUFACTURER	MODEL	DIMENSIONS				COLD WATER	HOT WATER	DRAIN	GAS SUPPLY	MECHANICAL				ELECTRIC SERVICE				REMARKS
					WIDTH	DEPTH	HEIGHT	WEIGHT					SUPPLY	EXHAUST	DUCT SIZE		H.P.	VOLT	PHASE	AMP	NEMA CONFIG.	
01	CABINET, P.O.S.	1	GLASTENDER	PCB-24	24"	24"	37"															
02	COFFEE BREWER	1	CURTIS	G4TP1S63B3100	11.13"	20.75"	24.75"		X	X		-	-	-	-		-	120/220	1	13.8/12.2	-	
03	COFFEE GRINDER	1	MAHLKONIG	EK43 S																		
04	COOLER, UNDER COUNTER	1	GLASTENDER	C1FB72	72"	24 1/8"	36"		-	-	-	-	-	-	-			120	1	15	5-15P	
05	DRAIN BOARD, W/ GLASS RACK	1	GLASTENDER	DBGR-18	18"	24"	37"															
06	DUMP SINK, W/ DRAIN BOARD	1	GLASTENDER	SWB-18-DB	18"	24"	37"															
07	GLASS WASHER	1	GLASTENDER	GD24HT	24 1/4"	26 7/8"	36 1/4"	281 lb		X	5/8"	-	-	-	-		3/4	60	1			
08	HAND SINK, W/ PAPER TOWEL DISPENSER	1	GLASTENDER	HSB-12-AD	12"	24"	37"															
09	HOT WATER DISPENSER	1	CURTIS	G3 WB5NB	7.5"	24.38"	25.75"		X	X		-	-	-	-			120/220	1	12.5/22.7		
10	ICE BIN, W/ SPEED RAIL	1	GLASTENDER	IBA-24	24"	24"	37"															
11	LIQUOR DISPLAY, W/ SPEED RAIL	1	GLASTENDER	LDB-18S	18"	24"	37"															
12	SODA GUN	1	GLASTENDER	SHB-6	6"	24"	21"															

DOOR AND FRAME SCHEDULE

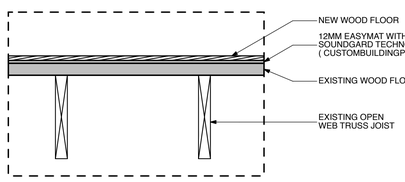
MARK	ROOM NAME	SIZE		HARDWARE		NOTES
		WIDTH	HEIGHT	SET NO	KEYSIDE RM NO	
D1	ENTRY LANDING	3'-0"	7'-0"	A		
D6	RESTROOM	3'-0"	8'-0"	B	RESTROOM	
D7		3'-0"	8'-0"	B	RESTROOM	

DOOR HARDWARE LEGEND:

A SCHLAGE ND SERIES
LOCK FUNCTION: OFFICE LOCK
LEVER DESIGN: RHO (RHODES)
FINISH: 626 (SATIN CHROMIUM PLATED)

B SCHLAGE ND SERIES
LOCK FUNCTION: BATHROOM PRIVACY LOCK / ND40S
LEVER DESIGN: RHO (RHODES)
FINISH: 626 (SATIN CHROMIUM PLATED)

C SCHLAGE ND SERIES
LOCK FUNCTION: STORAGE LOCK
LEVER DESIGN: RHO (RHODES)
FINISH: 626 (SATIN CHROMIUM PLATED)



3 FLOOR DETAIL
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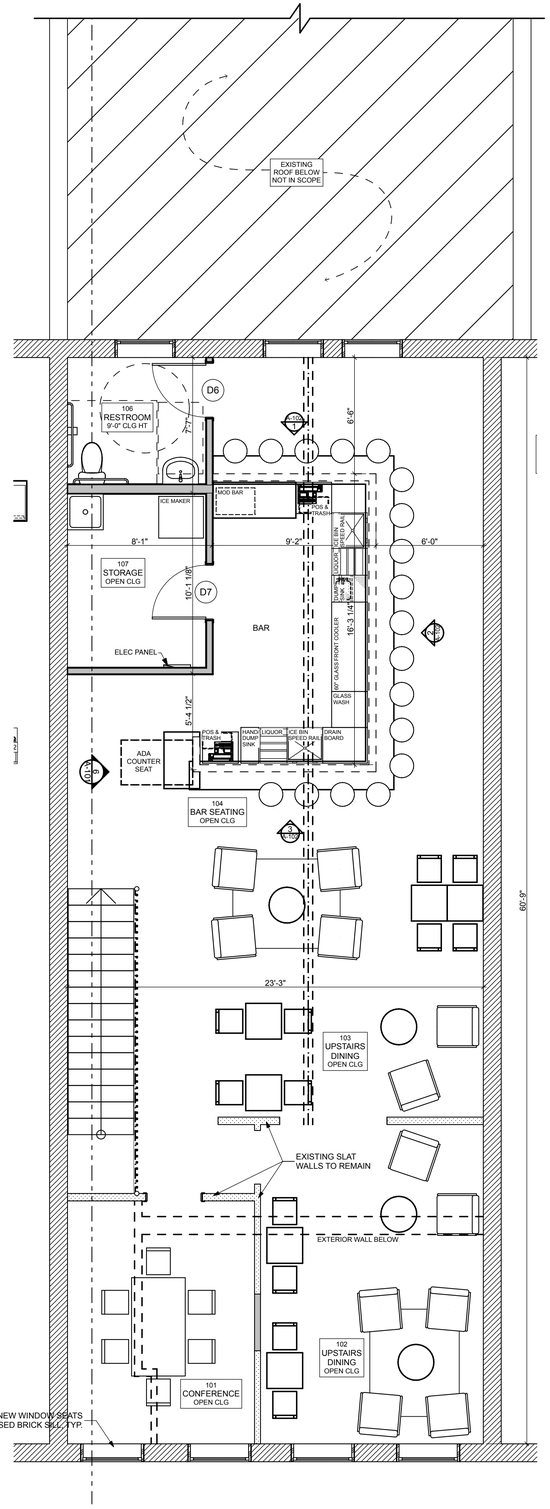

2 2ND FLOOR PLAN
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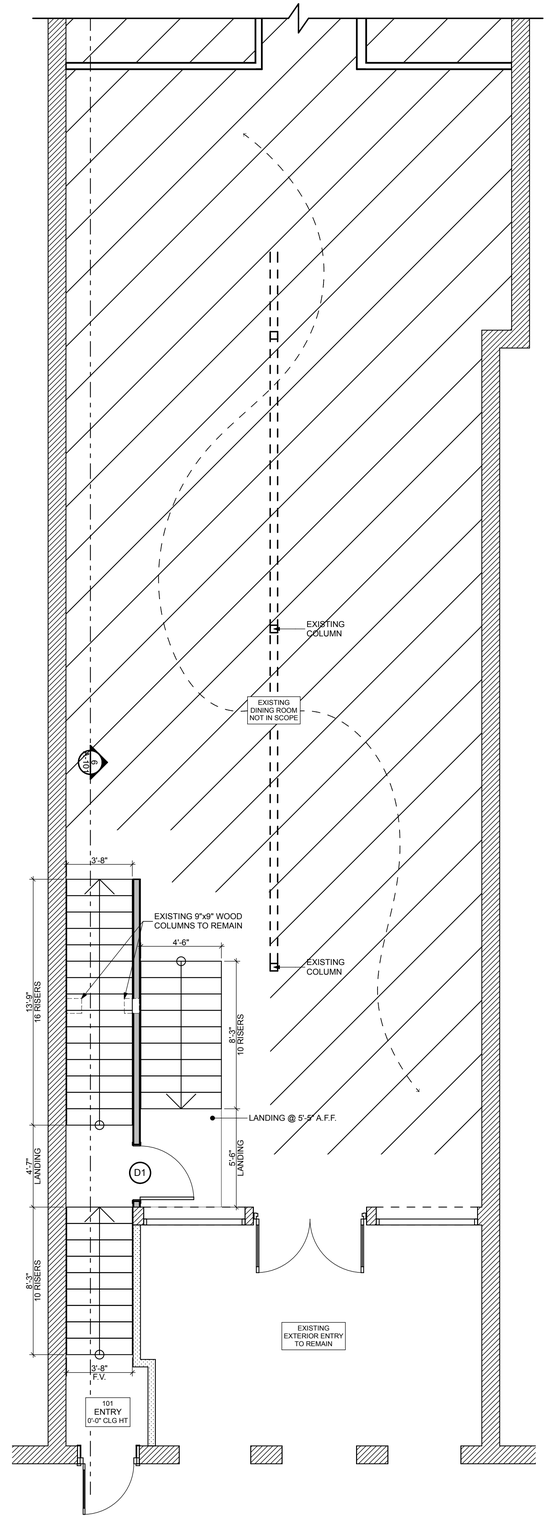

1 1ST FLOOR PLAN
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WEST OAK COFFEE SHOP

116 W. OAK STREET
DENTON, TX

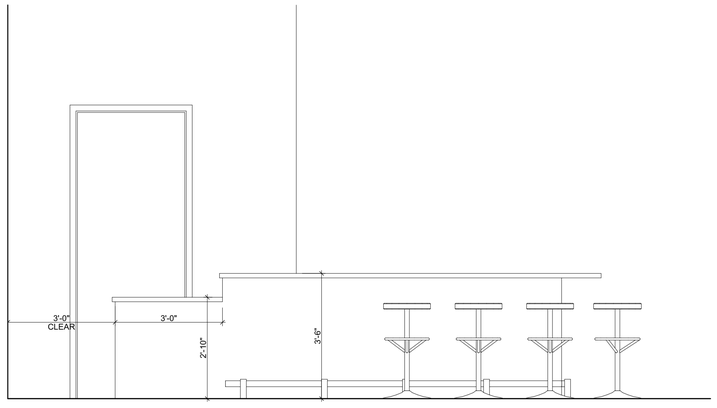
WILLIAM PECK & ASSOCIATES INC.
ARCHITECTS
Lewisville, Tx
972) 221-1424

REVISIONS
DATE

FLOOR PLANS

ISSUE DATE:

Scale: REF. PLAN
Drawn: JB
Job: 19-057-001
Sheet Number: A-101



3 BAR ELEVATION
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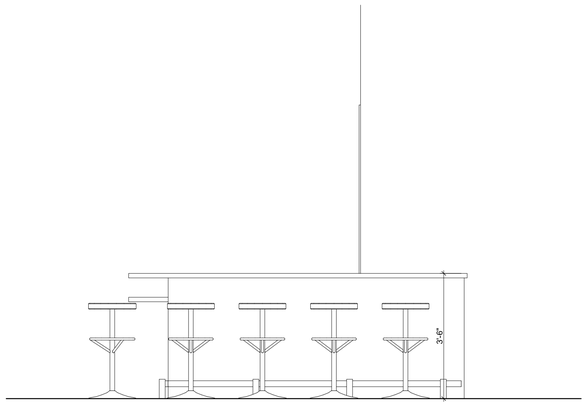

2 BAR ELEVATION
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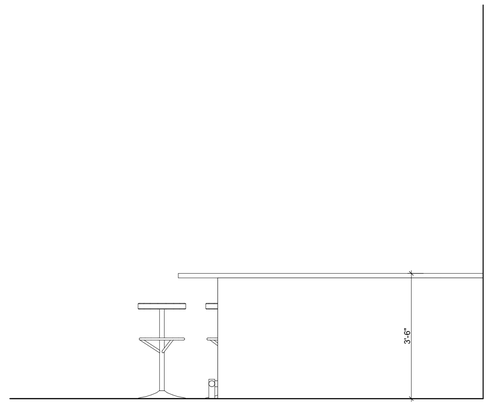

1 BAR ELEVATION
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INTERIOR ELEVATIONS

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A-102

WEST OAK
COFFEE SHOP
116 W. OAK STREET
DENTON, TX

REGISTERED ARCHITECT
WILLIAM C. PECK
18501
STATE OF TEXAS
08.08.2025

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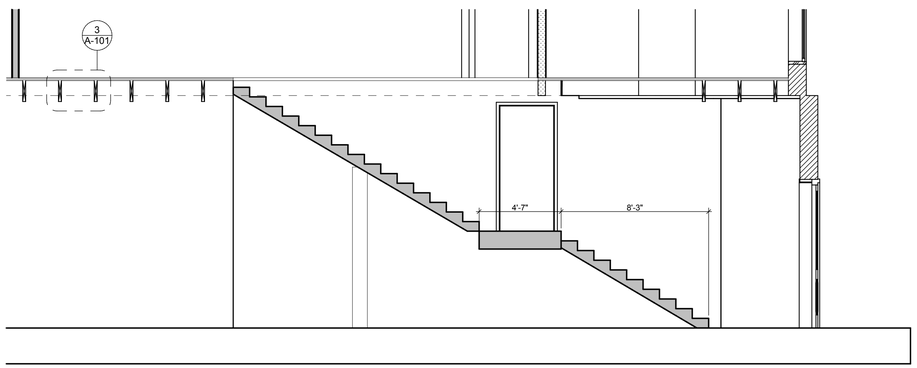

1 SECTION
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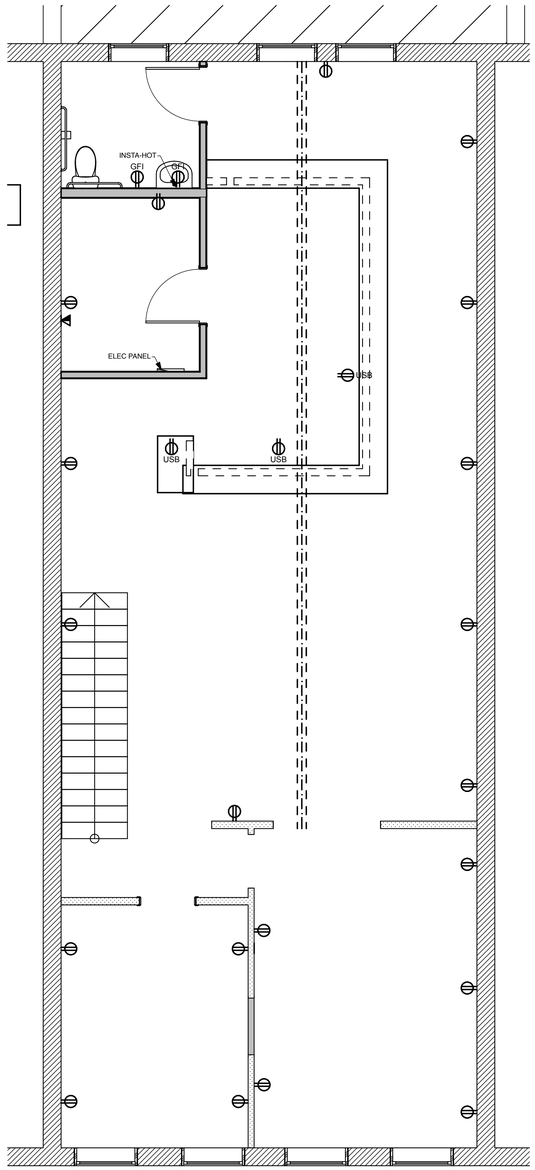

3 POWER PLAN
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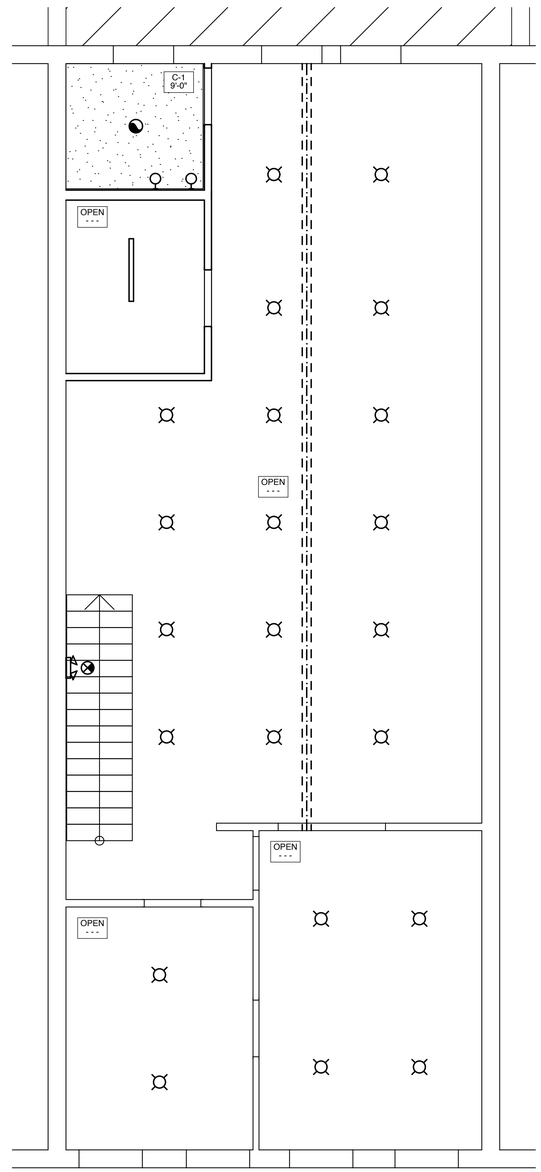

2 REFLECTED CEILING PLAN
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REFLECTED CEILING PLAN

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DATE	

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Job: 19-057-001
Sheet Number: A-104

ABBREVIATIONS

A

A/C	AIR CONDITIONING
ABV	ABOVE
AC	ALTERNATING CURRENT
ACC	AIR COOLED CHILLER
ACCU	AIR COOLED CONDENSING UNIT
ADJ	ADJUSTABLE
AF	AMPERE FUSE
AFC	ABOVE FINISHED CEILING
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AIC	AMPERE INTERRUPTING CURRENT
AL	ALUMINUM
AMPS	AMPERES
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
ARCH	ARCHITECT, ARCHITECTURAL
ARI	AIR CONDITIONING AND REFRIGERATION INSTITUTE
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR CONDITIONING ENGINEERS
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
ASTM	AMERICAN SOCIETY OF TESTING AND MATERIALS
AUX	AUXILIARY
AV	AIR VENT
AWG	AMERICAN WIRE GAUGE
AWS	AMERICAN WELDING SOCIETY
AWWA	AMERICAN WATER WORKS ASSOCIATION

B

BD	BACKDRAFT DAMPER
BFF	BELOW FINISHED FLOOR
BFW	BOILER FEED WATER
BKR	BREAKER
BLDG	BUILDING
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BOS	BOTTOM OF STRUCTURE
BTU	BRITISH THERMAL UNIT

C

C	CONDUIT
CATV	CABLE TELEVISION SYSTEM
CCTV	CLOSED CIRCUIT TELEVISION
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CFS	CUBIC FEET PER SECOND
CI	CAST IRON
CIRC	CIRCULATING
CKT	CIRCUIT
C	CENTERLINE
CLG	CEILING
CMU	CONCRETE MASONRY UNIT
CO	CLEANOUT
COL	COLUMN
CPVC	CHLORINATED POLYVINYL CHLORIDE
CU	COPPER
CW	COLD WATER
C	DEGREES CELSIUS

D

D	DEPTH
DB	DRY BULB
dB	DECIBEL
DC	DIRECT CURRENT
DEG	DEGREES
DESIG	DESIGNATION
DIA	DIAMETER
DIM	DIMENSION
DISC	DISCONNECT
DN	DOWN
DPDT	DOUBLE-POLE, DOUBLE-THROW
DPST	DOUBLE-POLE, SINGLE-THROW
DS	DOWNSPOUT
DWG	DRAWING
DX	DIRECT EXPANSION

E

EA	EACH
EAT	ENTERING AIR TEMPERATURE
ECC	ECCENTRIC
EDB	ENTERING DRY BULB
EF	EXHAUST FAN
EL	ELEVATION
ELEC	ELECTRICAL
ENCL	ENCLOSURE
EQUIP	EQUIPMENT
ESP	EXTERNAL STATIC PRESSURE
EWB	ENTERING WET BULB
EWC	ELECTRICAL WATER COOLER
EWT	ENTERING WATER TEMPERATURE
EXH	EXHAUST
EXIST	EXISTING

F

FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FCO	FLOOR CLEANOUT
FL	FLOW LINE
FLA	FULL LOAD AMPS
FLEX	FLEXIBLE
FPM	FEET PER MINUTE
FT	FOOT, FEET
FVN	FULL-VOLTAGE, NON-REVERSING
R	DEGREES FAHRENHEIT
F	FEED-THRU-LUGS
F.T.L.	

G

G,GND	GROUND
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GFI	GROUND FAULT INTERRUPTER
GFR	GROUND FAULT RELAY
GPD	GALLONS PER DAY
GPU	GALLONS PER HOUR
GPM	GALLONS PER MINUTE

H

H	HEIGHT
HD	HEAD, HUB DRAIN
HID	HIGH INTENSITY DISCHARGE
HOA	HAND-OFF-AUTOMATIC
HORIZ	HORIZONTAL
HP	HORSEPOWER
HSTAT	HUMIDISTAT
HSIM	HIGH PRESSURE STEAM
HTG	HEATING
HTR	HEATER
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
HW	HOT WATER
HYD	HYDRANT
HZ	HERTZ

I

ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IEEE	INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS
IES	ILLUMINATING ENGINEERING SOCIETY
IG	ISOLATED GROUND
IN	INCH
IN WC	INCHES OF WATER COLUMN

J

J-BOX	JUNCTION BOX

K

KCMIL	1000CIRCULAR MILS
KV	KILOVOLT
KVA	KILOVOLT-AMPS
KW	KILOWATT
KWH	KILOWATT-HOUR

L

L	LENGTH
LAT	LEAVING AIR TEMPERATURE
LB,#	POUNDS
LDB	LEAVING DRY BULB
LF	LINEAR FEET
LP	LOW PRESSURE
LRA	LOCKED ROTOR AMPS
LSTM	LOW PRESSURE STEAM (15 PSIG)
LTG	LIGHTING
LWB	LEAVING WET BULB
LWT	LEAVING WATER TEMPERATURE

M

MAX	MAXIMUM
MBH	1000 BTU PER HOUR
MCA	MINIMUM CIRCUIT AMPACITY
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MD	MOTORIZED DAMPER
MECH	MECHANICAL
MFGR	MANUFACTURER
MG	MOTOR GENERATOR
MH	MANHOLE, METAL HALIDE
MIN	MINIMUM
MLO	MAIN LUGS ONLY
MTD	MOUNTED

N

N/A	NOT APPLICABLE
NC	NOISE CRITERIA, NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
N/L	NIGHT LIGHT - OFTEN WITH BATTERY BACKUP
N.O.	NORMALLY OPEN
N.T.S.	NOT TO SCALE

O

OA	OUTSIDE AIR
OBD	OPPOSED BLADE DAMPER
O.C.	ON CENTER
OD	OUTSIDE DIAMETER
OH	OVERHEAD
OPG	OPENING
OS&Y	OUTSIDE STEM AND YOKE
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OS	OCCUPANCY SENSOR FOR LIGHTING CONTROLL

P

PD	PRESSURE DROP
PF	POWER FACTOR
PH	PHASE
PIV	POST INDICATOR VALVE
PLBG	PLUMBING
PNL	PANEL
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAUGE
PSV	PRESSURE SAFETY VALVE, RELIEF VALVE
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE

Q

QTY	QUANTITY

R

RA	RETURN AIR
RCP	REFLECTED CEILING PLAN, REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
RE:	REFERENCE, REFER
REC/RC	RECIRCULATE
REINF	REINFORCING
REQD	REQUIRED
REV	REVISION, REVISE
RGS	RIGID GALVANIZED STEEL
RH	RELATIVE HUMIDITY
RHG	REFRIGERANT HOT GAS
RL	REFRIGERANT LIQUID
RLA	RUNNING LOAD AMPS
RM	ROOM
RPM	REVOLUTIONS PER MINUTE
RS	REFRIGERANT SUCTION

S

SA	SUPPLY AIR
SD	SMOKE DAMPER, STORM DRAIN
SECT	SECTION
SF	SQUARE FEET
SHT	SHEET
SIM	SIMILAR
SHT MTL	SHEET METAL
SMACNA	SHEET METAL AND AIR CONDITIONING CONTRACTOR'S NATIONAL ASSOCIATION
SP	STATIC PRESSURE
SPEC	SPECIFICATION
SQ	SQUARE
SS	STAINLESS STEEL, SANITARY SEWER
ST	SOUND TRAP, STEAM TRAP
STD	STANDARD
STL	STEEL
SURF	SURFACE
SUSP	SUSPEND

T

TDH	TOTAL DYNAMIC HEAD
THRU	THROUGH
TP	TOTAL PRESSURE
TSP	TOTAL STATIC PRESSURE
TSTAT	THERMOSTAT
TYP	TYPICAL

U

U/F	UNDERFLOOR
U/G	UNDERGROUND
U/S	UNDERSLAB
UL	UNDERWRITERS LABORATORIES, INC.
UON	UNLESS OTHERWISE NOTED
UPS	UNINTERRUPTIBLE POWER SUPPLY

V

V	VOLT
VA	VOLT AMPERE
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VCP	VITRIFIED CLAY PIPE
VD	VOLUME DAMPER
VEL	VELOCITY
VERT	VERTICAL
VIE	VENT THROUGH ROOF

W

W	WATT, WIDTH
W/	WITH
W/O	WITHOUT
WB	WET BULB
WC	WATER COLUMN
WG	WATER GOING
WPD	WATER PRESSURE DROP
WP	WEATHER PROOF
WT	WATERTIGHT, WEIGHT

X

XFMR	TRANSFORMER

ELECTRICAL SYMBOL SCHEDULE

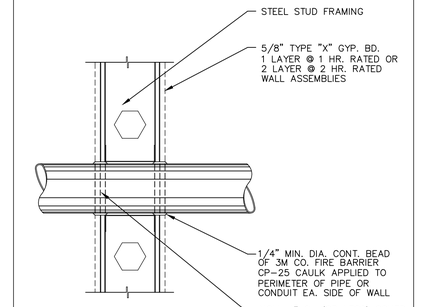
	*** DESCRIPTION ***
	FLUORESCENT LIGHT FIXTURE (SEE LIGHTING FIXTURE SCHEDULE)
	FLUORESCENT "OPEN" STRIPLIGHT
	INCANDESCENT "CAN" FIXTURE (SEE FIXTURE SCHEDULE)
	INCANDESCENT "WALL MTD." FIXTURE (SEE FIXTURE SCHEDULE)
	EXIT FIXTURE (SEE FIXTURE SCHEDULE)
$	SINGLE POLE TOGGLE SWITCH, HUBBELL #1221
$3	THREE WAY TOGGLE SWITCH, HUBBELL #1223
$D	DIMMER LIGHT SWITCH
	DUPLEX RECEPTACLE, HUBBELL #5362
	DUPLEX RECEPTACLE, HUBBELL #5362, W/CROUSE HINDS WLRD1 PL.
GFI	DUPLEX RECEPTACLE WITH GROUND FAULT INTERRUPTER
	SPECIALTY OUTLET (SEE PLANS FOR SIZE)
	POWER CONDUCTORS IN CONDUIT
	HOME RUN TO PNL. W/CKT#,PNL. DESIGNATION SHOWN
EWC	ELECTRIC WATER COOLER
AFF	ABOVE FINISHED FLOOR
WP	WEATHER PROOF
J	JUNCTION BOX (SEE PLANS FOR SIZE)
T	THERMOSTAT LOCATION
	SINGLE PHASE MOTOR (SEE PLANS FOR SIZE)
	THREE PHASE MOTOR (SEE PLANS FOR SIZE)
	FUSED AND NON-FUSED DISCONNECTS
C	CLOCK (SEE NOTES IF MASTER)
F	MANUAL PULL FOR FIRE ALARM - REF PROJECT MANUAL +44" A.F.F.
H	A.D.A. COMPLIANT STROBE HORN -REF. PROJECT MANUAL + 80" A.F.F.
S	SMOKE DETECTOR
	DATA
	TELEPHONE

MECHANICAL SYMBOLS

	EXHAUST FAN DUCT SHOWN UP
	SUPPLY DIFFUSER
	RETURN GRILL (1 X 1) OR AS SCHEDULED
T	THERMOSTAT
S	TEMPERATURE SENSOR
	RETURN GRILL / FILTER GRILL 2' X 4' OR AS SCHEDULED
A-400	DIFFUSER MARK AND CFM BALANCE
	FLEX DUCT AND VOLUME DAMPER
	PACKAGED ROOF MOUNTED HVAC SYSTEM
RTU-XX	CONDENSING UNIT OR HEAT PUMP

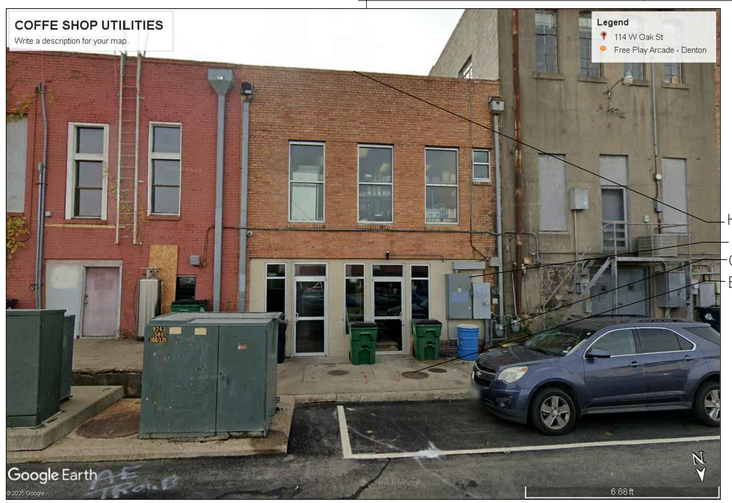
PLUMBING SYMBOLS

	COLD WATER	SS OR SK	SINK
	HOT WATER	EWC	ELECTRIC WATER COOLER
	HOT WATER @ 180°	HEWC	HANDICAPPED EWC
	SANITARY SEWER	DF	DRINKING FOUNTAIN
	NATURAL GAS	HDF	HANDICAPPED DRINKING FOUNTAIN
	SANITARY SEWER VENT		INLINE PUMP
SD	STORM DRAIN	VTR	VENT THRU ROOF
FS	FLOOR SINK W/ HALF COVER	SA	SHOCK ARRESTOR
FD	FLOOR DRAIN	CO	CLEANOUT
FFD	FUNNEL FLOOR DRAIN	DCO	DOUBLE CLEANOUT
HD	HUB DRAIN	WCO	WALL CLEANOUT
CW	CW	HB	HOSE BIB
HW	HW	RD	ROOF DRAIN
S	SOLENOID VALVE W/ SHUT OFF	RD-IW	ROOF DRAIN FOR INDIRECT WASTE
	BALL VALVE	TP	TRAP PRIMER
	GATE VALVE	AGF	AIR GAP FITTING
	CHECK VALVE		CONNECTION POINT
WC	WATER CLOSET		PIPING DOWN
HWC	HANDICAPPED WATER CLOSET		PIPING UP
UR	URINAL	WH	WATER HEATER
HUR	HANDICAPPED URINAL		COLD WATER
LAV	LAVATORY		HOT WATER
HLAV	HANDICAPPED LAVATORY		



NOTE:
WALL PENETRATIONS SHALL COMPLY WITH U.L. SYSTEM NO. WL 1001
F RATING - 1 HOUR, 2 HOUR

RATED PENETRATION



1 EXISTING UTILITIES -116 W OAK
SCALE: NONE COFFEE SHOP REAR ALLEY VIEW

GENERAL NOTES

A. REFER TO SPECIFICATIONS FOR MATERIALS AND METHODS FOR CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR JOB SITE WORK SAFETY.

B. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR THE EXACT LOCATION OF ALL CEILING MOUNTED DEVICES.

C. REFER TO ARCHITECTURAL INTERIOR ELEVATION DRAWINGS, WHERE THE ARCHITECT HAS DRAWN SUCH ELEVATIONS, FOR THE LOCATIONS OF ALL WALL MOUNTED DEVICES.

D. ALL DUCTWORK SIZES SHOWN ARE FREE AIR STREAM DIMENSIONS.

E. ALL PENETRATIONS THRU THE ROOF TO MECHANICAL EQUIPMENT SHALL BE WITH EQUIPMENT ROOF CURBS. COORDINATE THE EXACT LOCATION OF ALL PENETRATIONS WITH THE BUILDING STRUCTURE.

F. COORDINATE ALL SLAB PENETRATIONS AND SLEEVES PRIOR TO EACH CONCRETE POUR.

G. FURNISH ACCESS DOORS FOR INSTALLATION IN WALLS AND CEILINGS WHERE ACCESS IS REQUIRED TO CONCEALED MECHANICAL EQUIPMENT, VALVES, CONTROLS AND OTHER DIVICES.

H. INSTALL DUCTWORK AND PIPING TO PROVIDE THE MAXIMUM POSSIBLE CLEAR HEIGHT UNDERNEATH. MAINTAIN A MINIMUM OF 10 INCHES ABOVE FINISHED CEILING TO PROVIDE CLEARANCE FOR LIGHTING FIXTURES.

I. PAINT ANY ABOVE CEILING ITEMS WHICH CAN BE SEEN THROUGH AIR SLOTS OF GRILLE FLAT BLACK.

J. PROVIDE FLAT BLACK METAL BLANKOFF FOR UNUSED SECTIONS OF SLOT DIFFUSERS.

K. COORDINATE THE EXACT LOCATIONS OF HVAC EQUIPMENT WITH THE LOCATIONS OF LIGHTING FIXTURES, PIPING AND OTHER CONSTRUCTION, TO ALLOW FOR PROPER ACCESS TO SERVICE TERMINAL UNITS.

L. PERFORM WORK IN ACCORDANCE WITH THE LATEST EDITIONS, REVISIONS, AMENDMENTS OR SUPPLEMENTS OF APPLICABLE STATUTES, ORDINANCES, CODES OR REGULATIONS OF FEDERAL, STATE AND LOCAL AUTHORITIES HAVING JURISDICTION IN EFFECT ON THE DATE BIDS ARE RECEIVED.

✱✱✱ M. WHERE APPROVAL CODES HAVE BEEN ESTABLISHED BY OSHA, T.A.S., UNDERWRITERS LABORATORY, AMERICAN CODES, ANSI, ASME, ASA, ASHRAE, ASTM, ARI,IMC, IPC, NEC, NFRA, SMACNA, OR THE STATE FIRE INSURANCE REGULATORY BODY THESE STANDARDS SHALL BE FOLLOWED WHETHER OR NOT INDICATED ON THE DRAWINGS AND/OR SPECIFICATIONS.

N. ARRANGE WITH AUTHORITIES AND UTILITY COMPANIES FOR PERMITS, FEES, AND SERVICE CONNECTIONS, VERIFYING LOCATIONS AND ARRANGEMENTS AND PAY ALL CHARGES, INCLUDING INSPECTIONS.

O. WORKING PRESSURE OF PIPING SYSTEMS AND EQUIPMENT HAS BEEN ESTABLISHED AT 150 PSIG.

P. COORDINATE WORK WITH ARCHITECTURAL FEATURES AND COORDINATE WORK SO THAT INTERFERENCES BETWEEN PIPING, DUCTWORK, EQUIPMENT, PLUMBING WORK, ELECTRICAL WORK, AND BUILDING STRUCTURE WILL BE AVOIDED.

Q. THE ENTIRE SYSTEM AND ITS COMPONENT ITEMS OF EQUIPMENT SHALL OPERATE WITHOUT OBJECTIONABLE VIBRATION OR NOISE.

R. ALL WIRING AND ELECTRICAL CONTROLS SHALL BE INSTALLED IN ACCORDANCE WITH NFPA 70 (N.E.C.)- 2023 OR APPROVED EDITION

S. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING EXISTING CONDITIONS. NOTE THAT SOME EXISTING UTILITIES MAY EXIST UNDER THE PROPOSED NEW FLOOR LOCATION. THIS DRAWING DOES NOT NECESSARILY INCLUDE ALL BOUNDARY, ROADWAY, UTILITY OR OTHER SITE DATA OF UNKNOWN NATURE OR KNOWN SITE DATA NOT MADE AVAILABLE TO OUR OFFICE. NO WARRANTIES ARE GIVEN OR IMPLIED.

T. INSTALL COMPLETE GAS PIPING SYSTEM PIPING FOR EQUIPMENT SUCH AS, RADIANT HEATERS, RTU FURNACES, WATER HEATERS & COMPLETE WITH REGULATORS WHERE APPLICABLE . EXISTING GAS HEADER IS IN BACK NEAR BACK DOOR .

U. GREASE TRAP IS EXISTING. THIS FINISH OUT IS FOR NON FOOD AREA.

V. DOMESTIC WATER SERVICE AND METER IS EXISTING TO THIS BUILDING. ROUTE NEW LINE FROM THE BUILDING SERVICE AT ROOF DECK.

W. EXPECT TO PRIMARILY RUN SEWER WASTE PIPING UNDER THE FLOOR TO CONNECT TO EXISTING LINE RUNING IN THE REAR ALLEY(FROM UPSTAIRS).

X. UTILITIES ARE GENERALLY IN THE REAR OF THE BUILDING.

Y. ALL UTILITIES ARE EXISITNG.

These plans are intended to provide the basic construction information necessary to substantially complete this structure. These construction documents must be verified and supplemented by the contractor as to all dimensions, conditions, coordination, and/or omissions, if any are to be brought to the attention of the Designer prior to any construction or purchases being made. It is recommended that the owner or builder obtain the services of a competent contractor to supervise the construction of the project in all of any kind. NOTE: All Federal, state, and Local codes, ordinances, and restrictions take precedence over any part of these construction documents which may conflict with same. The contractor shall assume responsibility for all construction means and methods.
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WEST OAK
COFFEE SHOP

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REVISIONS

COVER SHEET

ISSUE DATE:

Scale:

Drawn: JB

Job: 19-057-001

Sheet Number: MEP-1

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STATE OF TEXAS
BRYANT HAWKES
49717
REGISTERED
PROFESSIONAL ENGINEER

02.12.2025

PERMIT, PRICING & CONSTRUCTION SET

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MECHANICAL SPECIFICATIONS

– MECHANICAL SPECIFICATIONS

– GENERAL PROVISIONS

0.01 PERFORMANCE: MECHANICAL CONTRACTOR SHALL PERFORM ALL WORK SPECIFIED, INDICATED AND REQUIRED UNLESS OTHERWISE NOTED, INCLUDING FINAL CONNECTIONS, IN A WORKMANLIKE MANNER USING WORKERS SKILLED AND EXPERIENCED IN THE TRADE.

0.02 SITE EXAMINATION: EXAMINE SITE BEFORE BIDDING. CLAIM NO EXTRAS RESULTING FROM LACK OF KNOWLEDGE OF SITE CONDITIONS. IF SITE CONDITIONS REQUIRE MODIFICATION OF THE SYSTEMS INDICATED IN THESE DOCUMENTS, SO ADVISE ENGINEER, AND IF ACCEPTED BY ENGINEER, INCLUDE COST OF SUCH MODIFICATIONS IN BID.

0.03 JOBSITE CONDITIONS: ACCEPT SOLE AND COMPLETE RESPONSIBILITY FOR CONDITIONS OF THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK.

0.04 FULL FUNCTION: PROVIDE ALL MINOR ITEMS NECESSARY FOR A COMPLETE AND FULLY FUNCTIONAL INSTALLATION.

0.05 ADMINISTRATION: PROVIDE EVIDENCE OF LICENSURE, BONDING, AND INSURANCE, AND PERFORM OTHER ADMINISTRATIVE FUNCTIONS, AS REQUIRED.

0.06 PERMITS: PROCURE AND PAY FOR ALL REQUIRED PERMITS AND SERVICE CHARGES.

0.07 COORDINATION: CONFORM TO GENERAL CONSTRUCTION CONTRACT DOCUMENTS EXCEPT AS MODIFIED HEREIN. REFER ALSO TO STRUCTURAL AND ELECTRICAL CONTRACT DOCUMENTS. COORDINATE ALL WORK WITH OTHER TRADES. PROVIDE SHOP DRAWINGS FOR MAJOR SYSTEMS.

0.08 CUTTING AND PATCHING: CUT AND PATCH AS REQUIRED. CUT OR WELD STRUCTURAL MEMBERS ONLY WITH APPROVAL OF STRUCTURAL ENGINEER. PATCHING SUBJECT TO APPROVAL BY ARCHITECT.

0.09 EXISTING FLOORS: TRENCH OR CORE BORE EXISTING FLOORS PER LANDLORD/OWNER REQUIREMENTS.

0.10 ROOF PENETRATIONS: COORDINATE WITH LANDLORD/OWNER.

0.11 EQUIPMENT SUBSTITUTIONS: REIMBURSE ELECTRICAL CONTRACTOR, AT NO CHARGE TO OWNER, FOR HIS COSTS INCURRED DUE TO SUBSTITUTION OF MECHANICAL EQUIPMENT HAVING ELECTRICAL REQUIREMENTS DIFFERING FROM THOSE INDICATED.

0.12 ADJUSTMENTS: MAKE MINOR ADJUSTMENTS TO WORK WHERE REQUESTED BY TENANT, WHEN SUCH ADJUSTMENTS ARE NECESSARY TO PROPER OPERATION AND WITHIN THE INTENT OF THE CONTRACT.

0.13 REFERENCE STANDARDS: COMPLY WITH APPLICABLE STANDARDS OF NFPA, ANSI, UL, ASHRAE, AND SMACNA, EXCEPT AS SUPERSEDED BY LOCAL AUTHORITY. CONFORM WITH CONTRACT DOCUMENTS WHERE THEY EXCEED CODE MINIMUM REQUIREMENTS AND 2018 IMC.

0.14 LOCAL REQUIREMENTS: COMPLY WITH THE REQUIREMENTS OF APPLICABLE CODES, LANDLORD, SERVING UTILITIES, AND THE LOCAL AUTHORITY HAVING JURISDICTION. SECURE APPROVAL OF INSTALLATION BY LANDLORD/OWNER, LOCAL AUTHORITY, AND OTHERS AS REQUIRED.

0.15 SCHEDULE: ORDER EQUIPMENT WITHIN 5 DAYS OF RECEIPT OF CONTRACT TO MAINTAIN CONSTRUCTION SCHEDULE.

0.16 MATERIALS AND EQUIPMENT: PROVIDE NEW, UL LISTED, COMMERCIAL GRADE MATERIALS, DEVICES, EQUIPMENT, AND FIXTURES, SUITABLE FOR ENVIRONMENT. REUSE EXISTING ONLY WHEN COMPLIANT WITH THE CONTRACT DOCUMENTS, IN GOOD CONDITION, AND APPROVED BY THE ENGINEER.

0.17 SHOP DRAWINGS: BEFORE ORDERING EQUIPMENT AND MATERIALS, SUBMIT NOT LESS THAN FIVE CERTIFIED COPIES OF ALL SHOP AND EQUIPMENT DRAWINGS FOR ENGINEER'S REVIEW, WHO WILL RETAIN TWO COPIES. ONLY FURNISH SYSTEMS AND EQUIPMENT IN COMPLIANCE WITH ACCEPTED SHOP DRAWINGS.

0.18 INSTALLATION: INSTALL ALL MATERIALS, EQUIPMENT AND SYSTEMS IN FULL ACCORD WITH MANUFACTURERS' INSTRUCTIONS.

0.19 LAYOUT: INSTALL ALL PIPING AND DUCTWORK TO PRESENT A NEAT AND ORDERLY APPEARANCE. RUN ALL LINES PARALLEL WITH BUILDING CONSTRUCTION. MAINTAIN HEADROOM AND EQUIPMENT CLEARANCE, AND GRADIENT WHERE REQUIRED. ALLOW FOR EXPANSION AND CONTRACTION.

0.20 ACCESS DOORS: PROVIDE ACCESS DOORS OR PANELS FOR ALL VALVES, CLEANOUTS, DAMPERS, CONTROLS, DEVICES, AND OTHER ITEMS REQUIRING INSPECTION OR MAINTENANCE. ACCESS PANELS SERVING HVAC COMPONENTS SHALL BE 12–INCHES BY 12–INCHES MINIMUM OR LARGER TO PROVIDE SUFFICIENT WORKING CLEARANCE FOR COMPONENT BEING ACCESSED.

0.21 COMMISSIONING: THOROUGHLY TEST AND DEMONSTRATE PROPER OPERATION OF ALL SYSTEMS AND EQUIPMENT FURNISHED OR INSTALLED UNDER THIS CONTRACT.

0.22 O & M MANUALS: AN OPERATION AND MAINTENANCE MANUAL SHALL BE PROVIDED TO THE BUILDING OWNER OR OPERATOR. THE MANUAL SHALL INCLUDE BASIC DATA RELATING TO THE OPERATION AND MAINTENANCE OF HVAC SYSTEMS AND EQUIPMENT. REQUIRED ROUTINE MAINTENANCE ACTIONS SHALL BE CLEARLY IDENTIFIED. WHERE APPLICABLE, HVAC CONTROLS INFORMATION SUCH AS DIAGRAMS, SCHEMATICS, CONTROL SEQUENCE DESCRIPTIONS, AND MAINTENANCE AND CALIBRATION INFORMATION SHALL BE INCLUDED.

0.23 WARRANTY: UNCONDITIONALLY WARRANT ALL WORK TO BE FREE OF DEFECTS IN MATERIALS AND WORKMANSHIP FOR ONE YEAR FROM DATE OF FINAL ACCEPTANCE, EXCEPT WARRANT AIR CONDITIONING COMPRESSORS FOR FIVE YEARS. DURING WARRANTY PERIOD REPAIR OR REPLACE DEFECTIVE MATERIALS, EQUIPMENT OR WORKMANSHIP WITHOUT COST TO OWNER .

0.24 EQUIPMENT IDENTIFICATION: IDENTIFY ALL APPLICABLE ROOFTOP EQUIPMENT WITH TENANT'S NAME AND SPACE NUMBER, USING 2" PAINTED CHARACTERS OR STAMPED METAL TAG.

0.25 DRAWINGS ARE DIAGRAMMATIC: VERIFY ALL DIMENSIONS AND LENGTHS, AND ADJUST EQUIPMENT, PIPE AND DUCT LOCATIONS TO AVOID CONFLICTS WITH OTHER CONSTRUCTION AND TRADES. CONTRACTORS RESPONSIBLE FOR RECORD DRAWINGS IF REQUIRED BY CITY. PROVIDE PRINTED SHOP DRAWINGS FOR REVIEW OF MAJOR SYSTEMS.

0.26 DOCUMENT PRIORITY: DRAWING INDICATIONS AND NOTATIONS SUPERSEDE THESE SPECIFICATIONS.

0.27 RATINGS: REFER TO DRAWINGS AND SCHEDULES FOR ADDITIONAL RATINGS AND REQUIREMENTS.

0.28 PROJECT REQUIREMENTS: REFER TO DRAWINGS FOR PARTICULAR PROJECT REQUIREMENTS, AS NOT ALL ITEMS INCLUDED IN THESE SPECIFICATIONS MAY BE REQUIRED FOR THIS PROJECT.

0.29 DOCUMENT ERRORS: NOTIFY THE ENGINEER OF ERRORS, DISCREPANCIES OR OMISSIONS BEFORE CONSTRUCTION OR FABRICATION OF WORK, OR, FAILING SUCH NOTICE, BE RESPONSIBLE FOR CORRECTING SAME WITHOUT COST TO OWNER, ARCHITECT OR ENGINEER.

0.30 SHOP DRAWINGS SUBMITTALS (MECHANICAL AND ELECTRICAL):
THE CONTRACTOR SHALL SUBMIT FIVE SETS OF PRINTED SHOP DRAWINGS.
THE SHOP DRAWINGS OF THE FOLLOWING EQUIPMENT USING THE INDICATED NUMBERING SYSTEM AND TITLES, SHALL BE SUBMITTED THROUGH THE ARCHITECT TO THE ENGINEER AND THEN RESUBMITTED FOR FINAL APPROVAL.
IF NECESSARY. SHOP DRAWINGS SHALL SUBMITTED FOR THE FOLLOWING ITEMS:

A. AIR CONDITIONING EQUIPMENT AND ACCESSORIES
B. EXHAUST FANS
C. LOUVERS
D. REGISTERS AND DIFFUSERS AND RELATED DUCTWORK
E. WATER HEATERS, TEMPERATURE REGULATING VALVES, ETC.
F. PLUMBING FIXTURES AND ACCESSORIES
G. PIPING AND ACCESSORIES

– PIPE AND FITTINGS

1.10 PIPE HANGERS AND SUPPORTS: PROPERLY SUPPORT ALL PIPING FROM JOISTS (TOP CHORD) OR OTHER STRUCTURAL MEMBERS. FOR PIPES UP TO 4" O.D., USE GRINELL FIG. 260 CLEVIS HANGERS WITH 3/8" ROD, OR FIG. 195 BRACKETS.

1.20 INSULATION SHIELDS: PROVIDE 18 GAUGE x 12" LONG GALVANIZED INSULATION SHIELDS AT SUPPORT POINTS FOR INSULATED PIPES.

1.30 PIPE SUPPORT SPACING: SUPPORT PIPE NOT LESS THAN 6 FT. ON CENTER FOR COPPER PIPE UP TO 2" O.D., OR NOT LESS THAN 10 FT. ON CENTER FOR STEEL PIPE UP TO 4" O.D.

1.40 COPPER CONTACT: PROVIDE COPPER PLATED HANGERS AND SUPPORTS WHERE IN CONTACT WITH COPPER PIPE.

1.50 PIPE SLEEVES: SLEEVE ALL HORIZONTAL PIPING WHICH PENETRATES WALLS WITH STANDARD WEIGHT STEEL PIPE OF 1" GREATER DIAMETER THAN PIPE OR INSULATION O.D. CUT SLEEVE FLUSH WITH WALL FINISH BOTH SIDES.

1.60 SEALANT: SEAL PIPE SLEEVES WITH ROPE AND EXPANDO NON–SHRINK SEALANT. FIRE/SMOKE SEAL PENETRATIONS OF RATED CONSTRUCTION TO MAINTAIN RATING.

1.70 WALL PLATES: FIT UNCOVERED PIPE PASSING THROUGH WALLS WITH WALL PLATES, CRANE NO. 10 OR EQUAL.

– THERMAL AND ACOUSTIC INSULATION

2.10 VIBRATION ISOLATION: PROVIDE EFFECTIVE VIBRATION ISOLATION DEVICES, AND FLEXIBLE CONNECTIONS, FOR ALL MOVING MACHINERY. PROVIDE DEVICES IN ACCORDANCE WITH THE RECOMMENDATIONS IN THE ASHRAE HANDBOOK, HVAC APPLICATIONS (LATEST EDITION), CHAPTER "SOUND AND VIBRATION CONTROL".

2.20 NOISE TRANSMISSION: INSTALL PIPING AND DUCTWORK FREE FROM CONTACT WITH STRUCTURE OR EQUIPMENT TO PREVENT NOISE TRANSMISSION.

2.30 INSULATION REQUIREMENTS: INSULATE SYSTEMS AS SPECIFIED ONLY AFTER THEY HAVE BEEN TESTED AND INSPECTED. CLEAN ALL SURFACES THOROUGHLY OF MOISTURE, FOREIGN MATERIAL, GREASE, AND RUST. INSTALL INSULATION CONTINUOUS THROUGH PENETRATIONS. COMPLY WITH TITLE 24 CALIFORNIA CODE.

2.31 INSULATION HAZARDS: USE ONLY INSULATION ADHESIVES, SEALERS, AND COATINGS WITH FIRE HAZARD RATING NOT TO EXCEED 25/50/50 FLAME SPREAD, FUEL CONTRIBUTED, AND SMOKE DEVELOPED, IN ACCORDANCE WITH UL 723 AND ASTM E84.

2.32 INSULATED PLUMBING SYSTEMS: INSULATE HOT AND COLD WATER PIPING, AND HORIZONTAL WASTE PIPING IN CEILING SPACE, WITH 1–IN. THICK CLOSED CELL, SELF SEALING FLEXIBLE TUBING, ARMAFLEX 2000 OR EQUAL.

2.34 ACOUSTICALLY LINED SUPPLY AND RETURN DUCT: UNLESS OTHERWISE INDICATED ON THE PLANS, LINE SUPPLY AND RETURN DUCTWORK WITHIN 10–FEET OF THE DISCHARGE AND INTAKE OF AIR HANDLING UNITS WITH 1" THICK GLASS FIBER ACOUSTICAL DUCT LINER BOARD, OWENS–CORNING, OR EQUAL. INCREASE DUCT SIZE INDICATED ON PLANS 2" EACH DIMENSION TO ACCOMMODATE DUCT LINER.

2.35 EXTERNALLY INSULATED SUPPLY DUCT: INSULATE SHEET METAL DUCTWORK WITH 2 INCH MINIMUM FIBERGLASS BLANKET DUCT WRAP WITH AN INTEGRAL VAPOR BARRIER FACING, OWENS–CORNING, OR EQUAL. THE INSULATION SHALL HAVE MINIMUM R=7.0 HR–SQ.FT.–DEG. F/BTU–IN. THERMAL RESISTANCE. DO NOT INSULATE PORTIONS OF DUCTWORK WHICH ARE INTERNALLY LINED.

2.40 INSULATED FLEXIBLE DUCT: GENERAL ENVIRONMENTAL CORPORATION TYPE GJ0A OR EQUAL, 5'–0" MAXIMUM LENGTH WITH A MINIMUM R=6.0 HR SQ.FT.–DEG. F/BTU–IN. THERMAL RESISTANCE. USE ONLY FOR FINAL CONNECTIONS TO CEILING DIFFUSERS.

– FIRE PROTECTION – EXISTING FIRE PROTECTION ROUGHED IN

3.10 FIRE PROTECTION EXISTING: PROVIDE A NEW FIRE PROTECTION SPRINKLER SYSTEM AS MAY BE REQUIRED BY ARCHITECTURAL DESIGN, AND IN ACCORDANCE WITH NFPA 13, APPLICABLE STATE AND LOCAL CODES, AND REQUIREMENTS OF FIRE INSURANCE UNDERWRITERS.

3.15 REFERENCES: ANSI/ASME B16.1 – CAST IRON PIPE FLANGES AND FLANGED FITTINGS, CLASS 25, 125, 250 AND 800.
ANSI/ASME B16.4 – CAST IRON THREADED FITTINGS, CLASS 125 AND 250.
ANSI/ASME B16.5 – PIPE FLANGES AND FLANGED FITTINGS
ANSI/AWWA C110 – DUCTILE IRON AND GRAY IRON FITTINGS
ANSI/AWWA C151 – DUCTILE IRON PIPE, CENTRIFUGALLY CAST
ANSI/ASTM D2564 – RIGID POLY (VINYL CHLORINE) (PVC) COMPOUNDS ALL CHLORINATED POLY (VINYL CHLORINE) (CPVC) COMPOUNDS.

3.20 QUALITY ASSURANCE: CONFORM TO NFPA 14 FOR STANDPIPE AND HOSE SYSTEMS. VALVES: PROVIDE MANUFACTURER'S NAME AND PRESSURE RATING MARKED ON VALVE BODY.

3.30 SUBMITTALS: SUBMIT PRODUCT DATA UNDER PROVISIONS OF DIVISION 1. INDICATE PIPE MATERIALS USED, JOINTING METHODS, SUPPORTS, FLOOR AND WALL PENETRATION SEALS. INDICATE VALVE DATA AND RATINGS.

3.40 DELIVERY, STORAGE, AND HANDLING: DELIVER AND STORE VALVES IN SHIPPING CONTAINERS, WITH LABELING IN PLACE, UNDER PROVISIONS OF SECTION 01000. PROVIDE TEMPORARY COATING ON CAST IRON AND STEEL VALVES. PROVIDE TEMPORARY END CAP AND CLOSURES. MAINTAIN IN PLACE UNTIL INSTALLATION.

3.50 PRODUCTS: PIPE SHALL BE IRON CONFORMING TO ANSI/AWWA C151, DUCTILE IRON. PIPE FITTINGS SHALL BE DUCTILE IRON CONFORMING TO ANSI/AWWA C110. UNIONS FLANGES AND COUPLINGS SHALL BE MECHANICAL GROOVED COUPLINGS. THEY SHALL HAVE MALLEABLE IRON HOUSING CLAMPS TO ENGAGE AND LOCK, DESIGNED TO PERMIT SOME ANGULAR DEFLECTION, CONTRACTION, AND EXPANSION; "C" SHAPED COMPOSITION SEALING GASKET, STEEL BOLTS, NUTS, AND WASHERS; GALVANIZED COUPLINGS FOR GALVANIZED PIPE. GATE VALVES SHALL BE OF IRON BODY, BRONZE TRIM, RISING STEM, SOLID WEDGE AND MANUFACTURED BY MUELLER, WITH SUBSTITUTIONS ONLY UNDER PROVISIONS OF SUPPLEMENTARY CONDITIONS PARAGRAPH 4.19. PROVIDE VALVE CONNECTIONS TO MATCH PIPE JOINTS. USE VALVES OF PIPE SIZE. FIRE HYDRANT SHALL BE MANUFACTURED BY MUELLER.

3.60 EXECUTION:

A. PREPARATION: REAM PIPE AND TUBE ENDS TO FULL INSIDE DIAMETER. REMOVE BURRS AND BEVEL PLAIN END FERROUS PIPE. REMOVE SCALE AND FOREIGN MATERIAL, INSIDE AND OUTSIDE, BEFORE ASSEMBLY.

B. INSTALLATION – PIPE: MECHANICAL GROOVED JOINTS MAY BE USED INSTEAD OF THREADED OR WELDED JOINTS. PROVIDE SLEEVES WHEN PENETRATING FOOTINGS, FLOORS, AND WALLS. SEAL PIPE AND SLEEVE PENETRATION TO ACHIEVE FIRE RESISTANCE EQUIVALENT TO FIRE SEPARATION REQUIRED.

C. INSTALLATION – VALVES: INSTALL VALVES WITH STEMS UPRIGHT OR HORIZONTAL, NOT INVERTED. PROVIDE GATE VALVES FOR SHUT–OFF OR ISOLATING SERVICE.

3.70 WET–PIPE SPRINKLER SYSTEMS: DESIGN AND INSTALL WET–PIPE SPRINKLER SYSTEM, PUMPS, AND FIRE DEPARTMENT CONNECTION. RELATED WORK IS SUPPORTS AN ANCHORS, AND VIBRATION ISOLATION. REFERENCE NFPA 13 – INSTALLATION OF SPRINKLER SYSTEMS. SYSTEM TO PROVIDE COVERAGE FOR ENTIRE BUILDING. INTERFACE SYSTEM WITH BUILDING FIRE AND SMOKE ALARM SYSTEM. PROVIDE SYSTEM TO NFPA 13, GROUP 2 ORDINARY HAZARD. PROVIDE FIRE DEPARTMENT CONNECTION. DESIGN AND INSTALLATION TO CONFORM TO NFPA 13 AND PER FIRE MARSHALL INSTRUCTIONS. EQUIPMENT AND COMPONENTS MUST BEAR UL OR FM LABEL OR MARKING. THE SPECIALIST FIRM MUST BE A COMPANY SPECIALIZING IN SPRINKLER SYSTEMS WITH MINIMUM OF THREE (3) YEARS EXPERIENCE. HYDRAULIC CALCULATION, PRODUCT DATA, SHOP DRAWINGS, AND LOW WATER PRESSURE CUT–IN CONTROLLER SHALL BEAR THE STAMP OF APPROVAL OF AUTHORITY HAVING JURISDICTION. INDICATE HYDRAULIC CALCULATIONS, DETAILED PIPE LAYOUT, HANGERS AN SUPPORTS, COMPONENTS AND ACCESSORIES. SUBMIT SHOP DRAWINGS, PRODUCT DATA, HYDRAULIC CALCULATIONS, TO AUTHORITY HAVING JURISDICTION FOR APPROVAL. SUBMIT PROOF OF APPROVAL TO ARCHITECT/ENGINEER. SUBMIT SHOP DRAWINGS, PRODUCT DATA, PROJECT RECORD DOCUMENTS, AND MANUFACTURER'S OPERATING AND MAINTENANCE DATA (INCLUDING WRITTEN MAINTENANCE DATA ON COMPONENTS OF SYSTEM, SERVICING REQUIREMENTS, AND RECORD DRAWINGS) UNDER PROVISIONS OF DIVISION 1. PROVIDE EXTRA SPRINKLER HEADS (INCLUDING SUITABLE WRENCHES FOR EACH HEAD TYPE) UNDER PROVISIONS OF NFPA 13 AND DIVISION 1.

3.80 PRODUCTS: FOR PIPING MATERIALS REFERENCE SECTION 3.60 ABOVE. THE AUTOMATIC SPRINKLER VALVE SHALL HAVE A FLOW DETECTOR WITH ALARM CIRCUITS, PRESSURE SWITCH, AND A PRESSURE RETARD CHAMBER. ALARM GONG SHALL BE WATER TYPE. THE FIRE DEPARTMENT CONNECTION SHALL BE ON A STANDARD WALL, THREAD OF A SIZE TO SUIT FIRE DEPARTMENT HARDWARE, TWO WAY THREADED DUST CAP AND CHAIN OF SAME MATERIAL AND FINISH, 3/4" AUTOMATIC DRIP, AND MARKED "SPRINKLER – FIRE DEPARTMENT CONNECTION". SPRINKLER HEADS SHALL BE MANUFACTURED BY GRINNEL, WITH SUBSTITUTIONS ONLY UNDER PROVISIONS OF DIVISION 1. SPRINKLER HEADS OF SUSPENDED CEILING TYPE SHALL BE STANDARD PENDANT TYPE WITH CHROME PLATED FINISH, WITH MATCHING ESCUTCHEON. SPRINKLER HEADS IN EXPOSED AREAS SHALL BE STANDARD UPRIGHT TYPE WITH CHROME PLATED FINISH. THOSE OF SIDEWALL TYPE SHALL BE OF CHROME PLATED FINISH WITH MATCHING ESCUTCHEON. THE FUSIBLE LINK SHALL BE TEMPERATURE RATED FOR SPECIFIC AREA HAZARD. THE GUARDS SHALL HAVE A FINISH TO MATCH SPRINKLER HEADS. COORDINATE BACKFLOW PREVENTOR TYPE WITH CITY ENGINEERING/FIRE DEPARTMENT.

3.90 EXECUTION:

A. PREPARATION: COORDINATE WORK OF THIS SECTION WITH OTHER AFFECTED WORK. PROVIDE FLEX JOINT AT BUILDING JOINT.

B. INSTALLATION – PIPING: INSTALL BURIED SHUT–OFF VALVE BOX. PROVIDE POST INDICATOR. PROVIDE DOUBLE CHECK VALVE ASSEMBLY AT SPRINKLER SYSTEM WATER SOURCE CONNECTION. LOCATE OUTSIDE ALARM GONG ON BUILDING WALL. PLACE PIPE RUNS TO MINIMIZE OBSTRUCTION TO OTHER WORK. PLACE PIPING IN CONCEALED SPACES ABOVE FINISHED CEILINGS. CENTER HEADS IN ONE DIRECTION ONLY IN CEILING TILE WITH LOCATION IN OTHER DIRECTION VARIABLE, DEPENDENT UPON SPACING AND COORDINATION WITH CEILING ELEMENTS. APPLY STRIPPABLE TAPE OR PAPER COVER TO ENSURE CONCEALED SPRINKLER HEAD COVER PLATES DO NOT RECEIVE FIELD PAINT FINISH. FLUSH ENTIRE PIPING SYSTEM OF FOREIGN MATTER. HYDROSTATICALLY TEST ENTIRE SYSTEM. TEST SHALL BE WITNESSED BY AUTHORITY HAVING JURISDICTION.

– PLUMBING

4.10 DOMESTIC (POTABLE) WATER SUPPLY PIPING: ABOVE GROUND: TYPE L HARD TEMPER COPPER TUBE PER ASTM B88, WITH WROUGHT COPPER FITTINGS PER USASI B16.18 AND .18a. BELOW GROUND: TYPE K SOFT TEMPER COPPER TUBE. USE ONLY 95/5 LEAD–FREE SOLDER IN POTABLE WATER PIPING. PROVIDE DIELECTRIC UNIONS AT EVERY JUNCTION OF TWO DISSIMILAR METAL PIPE MATERIALS. PEX PIPING IS ACCEPTABLE WHERE ALLOWED BY LOCAL CODES.

4.20 DRAIN, WASTE AND VENT PIPING: ABOVE GRADE: NO–HUB CAST IRON SANITARY SYSTEM PER CISPI 301–69T OR SCREWED GALVANIZED PIPE WITH CAST IRON DRAINAGE FITTINGS. BELOW GRADE: NO–HUB CAST IRON SANITARY SYSTEM PER CISPI 301–69T OR SERVICE WEIGHT CAST IRON HUB AND SPIGOT WITH NEOPRENE GASKET, PER CISPI HSN–68T. PVC SEWER PIPE IS ACCEPTABLE WHERE LOCAL CODES ALLOW.

4.40 VALVES: FURNISH AND INSTALL VALVES WHERE INDICATED ON PLAN AND AS NECESSARY FOR PROPER SYSTEM OPERATION AND COMPONENT ISOLATION. PROVIDE VALVES RATED FOR 125 PSI OR GREATER WORKING PRESSURE IN WATER PIPING.

F.P. HOSE BIBB	WADE OR EQUAL
CHECK VALVE UP TO 3"	CRANE NO. 37, OR EQUAL
GLOBE VALVE UP TO 3"	CRANE NO. 1, 17TF, OR EQUAL
GATE VALVE UP TO 3"	CRANE NO. 428,1334, OR EQUAL
BALL VALVE UP TO 3"	APOLLO SERIES 70–100, 70–200, OR EQUAL
TEMP. & PRESS. RELIEF VALVE	WATTS 10L MODEL M7, OR EQUAL, 3/4"Mx3/4"F
SHOCKSTOP	WADE W–5 (HOT), WADE W–10 (COLD)
BACKFLOW PREVENTOR	WATTS NO. RPZ 009M3QT SERIES, OR EQUAL
VACUUM RELIEF VALVE	WATTS NO N36 – 3/4", OR EQUAL
PRESSURE REDUCING VALVE	WATTS NO. U5 SERIES

4.70 PLUMBING FIXTURES: FURNISH AND INSTALL COMPLETE WITH FITTINGS AND ACCESSORIES AS REQUIRED. GENERALLY, MATCH EXISTING WHERE APPLICABLE, PARTICULARLY IN CLASS ROOM AREAS. PROVIDE AUTO TEMP REGULATING VALVES PER LATEST CODE AND CITY AMENDMENTS FOR SINKS WITH ASSE 1070 APPROVED THERMOSTATIC MIXING VALVES PER 2021 IPC 416.5 PROVIDE TRAP PRIMERS, INSTALL T&P PER 504.6 2021 IPC. EXTEND VENT PIPES AT LEAST 6 INCHES ABOVE ROOF. WATER HEATER DRAIN PANS PER SEC 504.7. EXPENSION TANKS SHALL NOT BE SUPPORTED BY PIPING (IPC 308.1) LABEL NON POTABLE WATER PIPES PER IPC .

4.73 ITEM ––––– DRINKING FOUNTAIN: ELKAY MODEL #EDFP BARRIER FREE, OR APPROVED EQUAL, WALL MOUNTING BRACKET, 18 GAUGE, TYPE 302, STAINLESS STEEL, VANDAL RESISTANT PUSH BAR WITH RAISED LETTERS, COMPLETE WITH SUPPLY AND DRAIN FITTINGS, 3/8" ANGLE STOPS AND 1–1/4" P–TRAP.

4.74 ITEM ––––– MOP BASIN: FIAT MODEL #MSB–2424 MOLDED STONE, OR APPROVED EQUAL, 24" x 24" x 10", 3–INCH STAINLESS STEEL DRAIN BODY, WITH VACUUM BREAKER, INTEGRAL STOPS, ADJUSTABLE WALL BRACE, PAIL HOOK, 3/4–INCH HOSE THREAD ON SPOUT, DOMED STRAINER AND LINT BASKET. PROVIDE CHROME PLATED, WALL MOUNTING SERVICE FAUCET MODEL #830–AA, HOSE, HOSE BRACKET AND MOP HANGER. REF PROJECT MANUAL FOR ADDITIONAL PLUMBING.

4.95 CLEANING AND TESTING: CLEAN, DISINFECT, AND TEST ALL PLUMBING AND PIPING SYSTEMS.

4.96 WHERE ROOF DRAIN LINES ARE INSIDE BUILDINGS, INSULATE LINES TO PREVENT CONDENSATE STAINS ON CEILING SYSTEMS. FOUR INCH DRAIN LINES ARE TYPICAL, WITH 6" FOR MORE THAN ONE R.D. ON A DRAIN LINE.

– HVAC PIPING AND SPECIALTIES

5.25 MISCELLANEOUS DRAIN LINES, RECEIVING COOLING COIL CONDENSATE, DRIP FOR HUMIDIFIERS, ETC.:
PIPING – PIPING SHALL BE TYPE "DWV" COPPER
FITTINGS – FITTINGS SHALL BE WROUGHT COPPER, SOLDER JOINTS.
JOINTS – JOINTS SHALL BE 50–50 SOLDER AND #50 FLUX.

– AIR HANDLING AND VENTILATION

7.50 AIR COOLED CONDENSING UNITS/HEAT PUMPS: LENNOX, TRANE, OR CARRIER; NO EXCEPTIONS. WORK INCLUDED: CONDENSING UNIT PACKAGE, INTERNAL PIPING AND ACCESSORIES, AND CONTROLS. RELATED WORK: PIPE FITTINGS, INSULATION, REFRIGERATION SPECIALTIES, FORCED AIR FURNACES, AND AIR HANDLING UNITS WITH COILS.
CONDENSING UNITS: PROVIDE SELF–CONTAINED, PACKAGED, FACTORY ASSEMBLED AND PREWIRED UNITS SUITABLE FOR OUTDOOR USE CONSISTING OF CABINET, COMPRESSORS, CONDENSING COIL AND FANS, INTEGRAL SUB–COOLING COIL, CONTROLS, LIQUID RECEIVER, WIND DEFLECTOR, AND SCREENS. PROVIDE AIR COOLED CONDENSING UNITS AS SCHEDULED ON DRAWINGS WITH AIR ENTERING CONDENSER AT 100 DEGREES. PROVIDE UNITS WITH EFFICIENCY RATINGS MINIMUM OF 14.0 ("STANDARD"). MATERIALS: USE CORROSION RESISTANT MATERIALS FOR PARTS IN CONTACT WITH REFRIGERANT. PROVIDE TIMER CIRCUITS TO PREVENT RAPID LOADING AND UNLOADING OF COMPRESSOR. CABINET: GALVANIZED STEEL WITH BAKED ENAMEL FINISH, AND REMOVABLE ACCESS DOORS OR PANELS WITH QUICK FASTENERS. COMPRESSOR: PROVIDE HERMETICALLY SEALED, 1750 RPM, RESILIENTLY MOUNTED COMPRESSOR WITH POSITIVE LUBRICATION, CRANKCASE HEATER, CYLINDER UNLOADERS FOR CAPACITY MODULATION, MOTOR OVERLOAD PROTECTION, SERVICE VALVES, AND FILTER DRIER.
CONDENSER COIL: SEAMLESS TUBING WITH ALUMINUM FINS. FANS: VERTICAL DISCHARGE, DIRECT DRIVE AXIAL FANS, RESILIENTLY MOUNTED WITH GUARD AND MOTOR MOTORS: PERMANENTLY LUBRICATED BALL BEARING MOTORS WITH BUILT–IN CURRENT AND OVERLOAD PROTECTION. CONTROLS: PROVIDE HIGH AND LOW PRESSURE CUTOUTS FOR COMPRESSOR, OIL PRESSURE CONTROL, NON–RECYCLING PUMP–DOWN, AND RESET RELAY. PROVIDE CONTROLS TO PERMIT OPERATION DOWN TO 50 DEGREES F AMBIENT TEMPERATURE AT MINIMUM COMPRESSOR LOAD. ADJUSTING: SUPPLY INITIAL CHARGE OF REFRIGERANT AND OIL FOR EACH REFRIGERATION SYSTEM. REPLACE LOSSES OF OIL OR REFRIGERANT PRIOR TO END OF CORRECTION PERIOD. SUPPLY TO OWNER, ONE COMPLETE CHARGE OF LUBRICATING OIL IN ADDITION TO THAT PLACED IN THE SYSTEM. SHUT DOWN SYSTEM IF INITIAL START–UP AND TESTING TAKES PLACE IN THE WINTER AND MACHINES ARE TO REMAIN INOPERATIVE. REPEAT START–UP AND TESTING OPERATION AT BEGINNING OF FIRST COOLING SEASON. PROVIDE COOLING SEASON START–UP, AND WINTER SEASON SHUT–DOWN FOR FIRST YEAR OF OPERATION. INSPECT AND TEST FOR REFRIGERANT LEAKS EVERY 3 (MONTHS) DURING FIRST YEAR OF OPERATION TO VERIFY SYSTEM INEGRITY.

7.51 PACKAGED THRU WALL UNITS: REF MECHANICAL SCHEDULES
IT ALTERNATE: SMALL MITSUBISHI DUCTLESS SPLIT SYSTEMS.

–PACKAGE ROOFTOP EQUIP. (GAS FIRED) EXISTING REUSED

7.60 ROOFTOP HVAC UNITS: TRANE, LENNOX, OR CARRIER . REUSE EXISTING RTU. FURNISH AND INSTALL ROOFTOP AIR CONDITIONING UNITS THAT ARE FACTORY ASSEMBLED, PIPED, INTERNALLY WIRED AND FULLY CHARGED WITH R–401A (OR APPROVED EQUAL). ALL UNITS ARE TO OPERATE CONTINUOUSLY AT OUTDOOR AMBIENT TEMPERATURES AS SCHEDULED. NOMINAL COOLING AND HEATING CAPACITIES SHALL BE AS SCHEDULED FOR THE AMBIENT CONDITIONS SHOWN ON THE DRAWINGS. UNIT EER SHALL MEET THE LATEST REQUIREMENTS OF ASHRAE 90.1–2013 or LATEST ADOPTED REVISION REQUIREMEN EER=14.0+ FOR 5 TONS AND UNDER,
UNIT EER=11.0+ FOR OVER 5 TONS. CASING SHALL BE OF GALVANIZED STEEL, ZINC PHOSPHATE AND FINISHED WITH MANUFACTURER'S STANDARD BAKED ENAMEL. PROVIDE UNITS WITH COMPRESSOR SHORT–CYCLING PROTECTION. COORDINATE WITH LAND LORD .
HVAC UNITS MUST INCLUDE HAIL GUARDS. ROUTE CONDENSATE THRU PITCH PAN ADJACENT TO EACH RTU AND TO SEWER AS ALLOWED BY LOCAL CODES. SERVICE EXISTING CONDENSATE LINE.

A. EXCEPT FOR PIPING WITHIN MANUFACTURER'S UNITS, HVAC DEFROST CYCLES. TWO MEANS OF MEETING THE REQUIREMENT PIPING SHALL BE INSULATED IN ACCORDANCE WITH TABLE 6.8.3. INSULATION EXPOSED TO WEATHER SHALL BE SUITABLE FOR OUTDOOR SERVICE, E.G., PROTECTED BY ALUMINUM, SHEET METAL PAINTED CANVAS, OR PLASTIC COVER. CELLULAR FOAM INSULATION SHALL BE PROTECTED AS ABOVE OR PAINTED WITH A COATING THAT IS WATER RETARDANT AND PROVIDES SHIELDING FROM SOLAR RADIATION.

– NATURAL GAS PIPING

7.70 (1) REFER TO PLUMBING FLOOR PLANS FOR LAYOUT AND ROUTING. DETAILS ARE NOT SHOWN ON FLOOR PLANS, USE SCHEMATIC PLANS FOR PIPING AS REQUIRED TO AVOID CONFLICT WITH DUCTWORK, OTHER SYSTEMS OR THE STRUCTURE. CONTRACTOR SHALL MAKE INSTALLATION BLACK WROUGHT STEEL PIPE STANDARD WEIGHT.

(2) PLUMBING CONTRACTOR SHALL INSTALL ALL UNDERGROUND GAS IN ACCORDANCE WITH THE TRANSPORTATION CODE BOOK TITLE 49 REGULATIONS, PART 192

ELECTRICAL SPECIFICATIONS SUMMARY

8.20 DUCTWORK ACCESSORIES:

A. BALANCING DAMPERS: AIR BALANCE, INC., LOUVERS & DAMPERS, INC., RUSKIN OR EQUAL. PROVIDE MANUAL, SINGLE OR MULTIBLADE DAMPERS, AS INDICATED AND AS CONSTRUCTED IN ACCORDANCE WITH SMACNA STANDARDS.

B. DAMPERS SHALL HAVE RIGID 2–IN. x 1/2–IN. x 10 GAUGE CHANNEL FRAMES, BALL OR BRONZE SLEEVE BEARINGS, 1/2–IN. POLISHED STEEL AXLES, 16–GAUGE, REINFORCED, FELT–EDGED BLADES (NOT OVER 8–IN. WIDE) AND STOP FRAMES AROUND THE ENTIRE PERIMETER. VOLUME DAMPERS IN DUCTS LARGER THAN 12–IN. x 6 IN. SHALL BE THE OPPOSED BLADE TYPE. DAMPERS IN ROUND DUCTS AND DUCTS 12–IN. x 6–IN. AND SMALLER SHALL BE BUTTERFLY TYPE. ROUND BUTTERFLY TYPE VOLUME DAMPERS SHALL BE 30 GAUGE, GALVANIZED STEEL THROUGH 12–IN. DIAMETER; 28 GAUGE FOR ABOVE 12–IN.

C. ALL DAMPERS SHALL BE EQUIPPED WITH STANDARD QUADRANTS OF SUITABLE SIZE IN EQUIPMENT ROOMS/AREAS AND YOUNG #301A, OR EQUAL, RECESSED–TYPE IN FINISHED AREAS. PROVIDE QUADRANT LOCKING DEVICE FOR EACH DAMPER ON ONE END OF THE SHAFT AND AN END BEARING PLATE ON THE OTHER END FOR DAMPER LENGTHS OVER 12–IN. PROVIDE EXTENDED QUADRANT LOCKS AND EXTENDED BEARING PLATES FOR EXTERNALLY INSULATED DUCTWORK. APPROVED MANUFACTURERS ARE VENTFABRICS, AND YOUNG REGULATOR CO.

D. DAMPERS SHALL BE COATED WITH RED ZINC CHROMATE PRIMER OVER A BOND COAT.

E. VOLUME DAMPERS, SPLITTERS AND DEFLECTORS SHALL BE PROVIDED IN ALL DUCTS TO PERMIT ACCURATE BALANCING OF THE SYSTEM. THE DAMPERS, SPLITTERS AND DEFLECTORS SHALL BE ADJUSTED TO SATISFY THE HEATING AND VENTILATING REQUIREMENTS OF THE CONDITIONED SPACE AND BE LOCKED IN PLACE.

8.40 AIR OUTLETS AND INLETS: FURNISH AND INSTALL TITUS, KRUEGER, OR APPROVED EQUAL, AS SCHEDULED. OPPOSED BLADE VOLUME DAMPERS FOR REGISTERS SHALL BE TITUS SERIES AG–35, KRUEGER SERIES 08C, OR EQUAL, OPPOSED BLADE TYPED WITH VERTICAL BLADES AND SCREWDRIVER SLOTS OR ALLEN WRENCH ADJUSTMENT ACCESSIBLE THROUGH THE REGISTER. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE MISCELLANEOUS ITEMS AS NECESSARY FOR A COMPLETE AND PROPER INSTALLATION IN THE TYPES OF WALLS AND CEILINGS USED ON THE PROJECT. THIS SHALL INCLUDE SUCH ITEMS AS FASTENERS, PLASTER RINGS, SUPPORTS, ETC.

8.60 FLEXIBLE CONNECTIONS: VENT FABRICS, INC., DURO DYNE, OR EQUAL. PROVIDE FLEXIBLE DUCT CONNECTIONS WHEREVER DUCTWORK CONNECTS TO VIBRATION ISOLATED EQUIPMENT AND WHERE SHOWN OR NOTED. MAKE AIRTIGHT JOINTS. PROVIDE ADEQUATE JOINT FLEXIBILITY TO ALLOW FOR THERMAL, AXIAL, TRANSVERSE AND TORSIONAL MOVEMENT. TYPICAL MAXIMUM RUN OUT IS 5 FT TO DIFFUSER

8.80 DUCT SMOKE DETECTOR: FURNISH AND INSTALL COMPATIBLE IONIZATION TYPE DUCT SMOKE DETECTORS WITH REMOTE TEST STATION IN SUPPLY DUCT AND RETURN DUCT AS INDICATED. CONNECT TO DE–ENERGIZE FAN UPON SMOKE DETECTION. CONNECTION TO TEST STATION AND FIRE ALARM SYSTEM BY OTHERS.

8.95 PROVIDE FIRE DAMPERS AT RATED ASSEMBLY PENETRATIONS PER 2021 IBC REFER ARCHITECTURAL

8.90 TYPICAL MAIN DUCT SIZES VS. CFM @ .08/100 FT.:

6" ~	180
8" ~	275
10" ~ OR 10"x8"	350
12" ~ OR 12"x10"	575
14" ~ OR 12"x12"	900
16" ~ OR 14"x14"	1300
18" ~ OR 20"x14"	1800
20" ~ OR 24"x14"	2300
24" ~ OR 24"x20"	3900
24"x16"	3000
24"x24"	5000
30"x16"	4000
36" ~ OR 36"x30"	10000

– SYSTEM CONTROL AND OPERATION

9.10 SPACE TEMPERATURE CONTROL: FURNISH AN INSTALL, UNLESS NOTED OTHERWISE, ALL THERMOSTATS, SENSORS, CONTROLLERS, RELAYS, CONTACTORS, DAMPERS, ACTUATORS, TUBING, CONTROL WIRING AND ALL OTHER ITEMS AND MATERIALS NECESSARY FOR A COMPLETE AND PROPERLY OPERATING TEMPERATURE CONTROL SYSTEM AS SPECIFIED BELOW. ALL THERMOSTATS AND OTHER CONTROL COMPONENTS SHALL BE HONEYWELL, OR APPROVED EQUAL, UNLESS SPECIFIED OTHERWISE. ALL CONTROL WIRING SHALL BE BY MECHANICAL CONTRACTOR AND SHALL BE INSTALLED IN CONDUIT.

9.11 THERMOSTAT: TRANE 7–DAY PROGRAMMABLE, THERMOSTAT TO CONTROL THE OPERATION OF EACH RTU OR SPLIT SYSTEM . MOUNT THERMOSTAT AT 4'–0" A.F.F. AND PROVIDE LOCKING CLEAR PLASTIC COVER. PROVIDE SMOKE DETECTOR AND CO2 SENSORS .

9.12 (A) WHERE SEPARATE HEATING AND COOLING EQUIPMENT SERVES THE SAME TEMPERATURE ZONE, THERMOSTATS SHALL BE INTERLOCKED TO PREVENT SIMUTANANEOUS HEATING AND COOLING EXCEPT FOR HUMIDITY CONTROLS.

(B) THE SYSTEM SHALL BE CONTROLLED BY MANUAL CHANGEOVER OR CAPABLE OF RETAINING PROGRAMMING AND TIME SETTING DURING DUAL SET–POINT THERMOSTAT, A LOSS POWER FOR A PERIOD OF AT LEAST 10 HOURS (3)

(C) SYSTEMS SERVING SPACES OTHER THAN HOTEL/MOTEL GUEST ROOMS. AND OTHER THAN THOSE REQUIRING CONTINUOUS OPERATION, WHICH HAVE BOTH A COOLING OR HEATING CAPACITY GREATER THAN 15,000 BTU/H AND A SUPPLY FAN MOTOR POWER GREATER THAN HP, SHALL BE PROVIDED WITH A TIME CLOCK THAT (1) CAN START AND STOP THE SYSTEM UNDER DIFFERENT SCHEDULES FOR SEVEN DIFFERENT DAY–TYPES PER WEEK, (2) IS CAPABLE OR RETAINING PROGRAMMING AND TIME SETTING DURING A LOSS OF POWER FOR A PERIOD OF AT LEAST 10 HOURS, (3) INCLUDES AN ACCESSIBLE MANUAL OVERRIDE THAT ALLOWS TEMPORARY OPERATION OF THE SYSTEM FOR UP TO TWO HOURS, (4) IS CAPABLE OF TEMPERATURE SETBACK DOWN TO 55F DURING OFF HOURS, AND (5) IS CAPABLE OF TEMPERATURE SETUP TO 90F DURING OFF HOURS.

– TESTING, ADJUSTING, BALANCING

9.51 NEBB OR AABC CERTIFIED TESTING AND BALANCING CONTRACTOR SHALL BE RESPONSIBLE FOR THE TESTING AND BALANCING OF EVERY HEATING, VENTILATING AND AIR CONDITIONING SYSTEM. THE PERSON OR AGENCY RESPONSIBLE FOR BALANCING OF THE SYSTEMS SHALL DOCUMENT IN WRITING THE AMOUNT OF OUTDOOR AIR BEING PROVIDED AND DISTRIBUTED FOR THE BUILDING OCCUPANTS AND ANY OTHER SPECIALTY VENTILATION. TWO (2) COPIES OF A WRITTEN REPORT IN NEBB OR AABC FORMAT SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.

9.52 AIR SYSTEMS SHALL BE BALANCED IN A MANNER TO MINIMIZE LOSSES FROM DAMPER THROTTLING BY FIRST ADJUSTING FAN SPEED THEN ADJUSTING DAMPERS TO MEET DESIGN FAN/V CONDITIONS. DAMPER THROTTLING ALONE MAY BE USED FOR AIR SYSTEM BALANCING WITH FAN MOTORS OF 1 HP OR LESS, OR IF THROTTLING RESULTS IN NO GREATER THAN 1/3 HP FAN HORSEPOWER DRAW ABOVE THAT REQUIRED IF THE FAN SPEED WERE ADJUSTED.

9.53 HVAC CONTROL SYSTEMS SHALL BE TESTED TO ASSURE THAT CONTROL ELEMENTS ARE CALIBRATED, ADJUSTED, AND IN PROPER WORKING CONDITION.

9.54 WHERE EXISTING EQUIPMENT IS REUSED PER OWNER INSTRUCTIONS, BALANCE SYSTEM FOR BEST PERFORMANCE.

9.55 BALANCE THE SYSTEM PER:
1) 6.7.2.3.1 NEBB PROCEDURAL STANDARD–2019 PROCEDURAL STANDARDS F19 BUILDING SYSTEMS COMMISSIONING OR
2) 6.7.2.3.1 AABC 2020 ASSOCIATED AIR BALANCE COUNCIL TEST AND BALANCE PROCEDURES, OR
3) 6.7.2.3.1 ASHREA STANDARD 111– 2011 PRACTICES FOR MEASUREMENT, TESTING, ADJUSTING AND BALANCING OF BUILDING HEATING, VENTILATION, AIR–CONDITIONING AND REFRIGERATION, OR LATEST ADOPTED REVISION.

– GENERAL PROVISIONS SUMMARY – REF MEP–1

0.01 PERFORMANCE: ELECTRICAL CONTRACTOR SHALL PERFORM ALL WORK SPECIFIED, INDICATED AND REQUIRED UNLESS OTHERWISE NOTED, INCLUDING FINAL CONNECTIONS, IN A WORKMANLIKE MANNER USING WORKERS SKILLED AND EXPERIENCED IN THE TRADE.

0.02 SITE EXAMINATION: EXAMINE SITE BEFORE BIDDING. CLAIM NO EXTRAS RESULTING FROM LACK OF KNOWLEDGE OF SITE CONDITIONS. IF SITE CONDITIONS REQUIRE MODIFICATION OF THE SYSTEMS INDICATED IN THESE DOCUMENTS, SO ADVISE ENGINEER, AND IF ACCEPTED BY ENGINEER, INCLUDE COST OF SUCH MODIFICATIONS IN BID. REFERENCE CIVIL DRAWINGS FOR SITE UTILITIES.

0.03 JOB SITE CONDITIONS: ACCEPT SOLE AND COMPLETE RESPONSIBILITY FOR CONDITIONS OF THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK.

0.04 FULL FUNCTION: PROVIDE ALL MINOR ITEMS NECESSARY FOR A COMPLETE AND FULLY FUNCTIONAL INSTALLATION.

0.05 ADMINISTRATION: PROVIDE EVIDENCE OF LICENSER, BONDING, AND INSURANCE, AND PERFORM OTHER ADMINISTRATIVE FUNCTIONS, AS REQUIRED.

0.06 PERMITS: PROCURE AND PAY FOR ALL REQUIRED PERMITS AND SERVICE CHARGES.

0.07 COORDINATION: CONFORM TO GENERAL CONSTRUCTION CONTRACT DOCUMENTS EXCEPT AS MODIFIED HEREIN. REFER ALSO TO STRUCTURAL AND MECHANICAL CONTRACT DOCUMENTS. COORDINATE ALL WORK WITH OTHER TRADES.

0.08 CUTTING AND PATCHING: CUT AND PATCH AS REQUIRED. CUT OR WELD STRUCTURAL MEMBERS ONLY WITH APPROVAL OF STRUCTURAL ENGINEER. PATCHING SUBJECT TO APPROVAL BY ARCHITECT.

0.09 EXISTING FLOORS: TRENCH EXISTING FLOORS PER LANDLORD (SEE CONCRETE SECTION OF LL'S SPECIFICATIONS FOR TENANT FINISH OUT FOR REQUIREMENTS.)

0.10 ROOF PENETRATIONS: COORDINATE WITH LANDLORD.

0.11 MECHANICAL SUBSTITUTIONS: INVOICE MECHANICAL CONTRACTOR, NOT TENANT, FOR COSTS INCURRED DUE TO SUBSTITUTION OF MECHANICAL EQUIPMENT HAVING ELECTRICAL REQUIREMENTS DIFFERING FROM THOSE INDICATED.

0.12 ADJUSTMENTS: MAKE MINOR ADJUSTMENTS TO WORK WHERE REQUESTED BY TENANT, WHEN SUCH ADJUSTMENTS ARE NECESSARY TO PROPER OPERATION AND WITHIN THE INTENT OF THE CONTRACT.

0.13 REFERENCE STANDARDS: COMPLY WITH NEC, T.A.S., AND APPLICABLE STANDARDS OF NFPA, ANSI, NEMA AND UL, EXCEPT AS SUPERSEDED BY LOCAL AUTHORITY. HAVE ON CONTRACT DOCUMENTS WHERE THEY EXCEED CODE MINIMUM REQUIREMENTS.

0.14 LOCAL REQUIREMENTS: COMPLY WITH THE REQUIREMENTS OF LOCAL CODES, LANDLORD, SERVING UTILITY, AND THE LOCAL AUTHORITY HAVING JURISDICTION. SECURE APPROVAL OF INSTALLATION BY LANDLORD, LOCAL AUTHORITY, AND OTHERS AS REQUIRED.

0.15 SCHEDULE: ORDER EQUIPMENT WITHIN 5 DAYS OF RECEIPT OF CONTRACT TO MAINTAIN CONSTRUCTION SCHEDULE.

0.16 MATERIALS AND EQUIPMENT: PROVIDE NEW, UL LISTED, COMMERCIAL GRADE MATERIALS, DEVICES, EQUIPMENT, AND FIXTURES, SUITABLE FOR ENVIRONMENT. REUSE EXISTING ONLY WHEN COMPLIANT WITH THE CONTRACT DOCUMENTS, IN GOOD CONDITION, AND APPROVED BY THE ENGINEER.

0.17 TEMPORARIES: FURNISH, INSTALL, AND REMOVE TEMPORARY LIGHTING AND POWER FOR ALL TRADES AS REQUIRED.

0.18 INSTALLATION: INSTALL ALL MATERIALS, EQUIPMENT AND SYSTEMS IN FULL ACCORD WITH MANUFACTURERS' INSTRUCTIONS.

0.19 COMMISSIONING: THOROUGHLY TEST AND DEMONSTRATE PROPER OPERATION OF ALL SYSTEMS AND EQUIPMENT FURNISHED OR INSTALLED UNDER THIS CONTRACT. VERIFY PROPER MOTOR ROTATION OF ALL EQUIPMENT.

0.20 O & M MANUALS: AT COMPLETION OF PROJECT,, PROVIDE TO TENANT ALL OPERATING AND MAINTENANCE MANUALS AND INFORMATION FOR MATERIAL, EQUIPMENT AND SYSTEMS INSTALLED UNDER THIS CONTRACT.

0.21 CORRECTIVE PERIOD: PROVIDE A CORRECTIVE PERIOD FROM DATE OF FINAL ACCEPTANCE OF NOT LESS THAN ONE (1) YEAR FOR THE ENTIRE INSTALLATION, DURING WHICH PERIOD UNCONDITIONALLY MAKE GOOD ANY DEFECTS IN MATERIALS OR WORKMANSHIP WITHOUT COST TO TENANT.

0.22 DRAWINGS ARE DIAGRAMMATIC: VERIFY ALL DIMENSIONS AND LENGTHS, AND ADJUST EQUIPMENT AND RACEWAY LOCATIONS TO AVOID CONFLICTS WITH OTHER CONSTRUCTION.

0.23 DOCUMENT PRIORITY: DRAWING INDICATIONS AND NOTATIONS SUPERSEDE THESE SPECIFICATIONS. USE A COMPLETE SET OF DRAWINGS.

0.24 RATINGS: REFER TO DRAWINGS AND SCHEDULES FOR ADDITIONAL RATINGS AND REQUIREMENTS.

0.25 PROJECT REQUIREMENTS: REFER TO DRAWINGS FOR PARTICULAR PROJECT REQUIREMENTS, AS NOT ALL ITEMS SPECIFIED MAY BE REQUIRED FOR THIS PROJECT.

0.26 DOCUMENT ERRORS: NOTIFY THE ENGINEER OF ERRORS, DISCREPANCIES OR OMISSIONS BEFORE CONSTRUCTION OR FABRICATION OF AFFECTED WORK, OR, FAILING SUCH NOTICE, BE RESPONSIBLE FOR CORRECTING SAME.

0.27 CERTIFICATION: PROFESSIONAL ENGINEER CERTIFICATION OF THESE DOCUMENTS DOES NOT EXTEND TO STANDARDIZED DESIGN OR INSTALLATION GUIDELINES PREPARED BY OTHERS AND REQUIRED BY A THIRD PARTY TO BE INCLUDED HEREON.

16100 – MATERIALS

1.01 RACEWAY: CONTINUOUS SYSTEM, 3/4" MINIMUM EMT EXCEPT: 3/4" MINIMUM RNC WITH GROUND CONDUCTOR WHERE EMBEDDED IN CONCRETE OR MASONRY; 3/4" MINIMUM GALVANIZED RMC OR IMC WHERE EXPOSED TO WEATHER (ALSO PERMITTED WHERE EMBEDDED IN CONCRETE OR MASONRY); AND FMC (OR LITMC IF WET LOCATION) FOR SHORT FINAL CONNECTIONS TO LIGHTING FIXTURES, TRANSFORMERS, AND MECHANICAL EQUIPMENT. REFERENCE 1.09.

1.02 IG RACEWAY: PROVIDE SEPARATE RACEWAY SYSTEM FOR IG CIRCUITS.

1.03 RACEWAY INSTALLATION: CONCEAL RACEWAY IN FINISHED SPACES. ROUTE SQUARE WITH BUILDING LINES AND PROPERLY SUPPORT. DO NOT ATTACH TO OR PENETRATE HVAC DUCTS. MAINTAIN HEADROOM AND EQUIPMENT AND FLUE CLEARANCE. FIRE/SMOKE – SEAL PENETRATIONS OF RATED CONSTRUCTION.

1.04 RACEWAY ADJUSTMENTS: WHERE INDIVIDUAL HOME RUNS ARE SHOWN FOR CLARITY, COMBINE AND ADJUST RACEWAY SIZE PER FIELD CONDITIONS.

1.05 WIRE: TYPE THHN, COPPER ONLY, 12AWG MINIMUM, STRANDED FOR 8AWG AND LARGER. LV WIRING FOR EMERGENCY LIGHTING, 10AWG MINIMUM.

1.06 COLOR CODE: COLOR CODE ENTIRE WIRING SYSTEM FROM SERVICE DISCONNECT OR TRANSFORMER THROUGHOUT ALL BRANCH CIRCUITS AS FOLLOWS:

SYSTEM VOLTAGE	CONDUCTOR TYPE	COLOR
208Y/120	PHASE A	BLACK
	PHASE B	RED
	PHASE C	BLUE
	NEUTRAL	WHITE
	EQUIPMENT GROUND	GREEN
	ISOLATED GROUND	GREEN W/YELLOW STRIPE

1.07 WIRE SIZE: WHERE WIRES ARE SIZED PER 60 DEG. C TEMPERATURE RATING FOR SIZES UP TO 1 AWG, SUBJECT TO COMPLIANCE WITH EQUIPMENT UL LISTING, AND APPROVAL OF LOCAL AUTHORITY AND ENGINEER, SUCH WIRES MAY BE REDUCED TO 75 DEG. C RATED SIZE, WITH RACEWAY SIZE ADJUSTED ACCORDINGLY. WIRE SIZE PER 90 DEG. C TEMPERATURE RATING IS NOT APPROVED.

1.08 VOLTAGE DROP: FOR CONDUCTORS SIZED PER NEC ON DRAWINGS, INCREASE SIZE BY NUMBER OF STANDARD SIZES SHOWN IN TABLE TO COMPENSATE FOR VOLTAGE DROP. CONTACT ENGINEER FOR ASSISTANCE IF CIRCUIT LENGTH FROM SOURCE TO LOAD EXCEEDS MAXIMUMS SHOWN.

CCT VOLTS/PH	CCT LENGTH FT.	UPSIZE
120/1	75–150	1
120/1	150–200	2
208/3	150–200	1
208/3	200–250	2

1.09 TYPE MC CABLE: MC CABLE EQUIPPED WITH A GREEN INSULATED GROUND PERMITTED FOR BRANCH CIRCUITS IN CONCEALED LOCATIONS ONLY SUBJECT TO APPROVAL OF TENANT, LANDLORD, AND LOCAL AUTHORITY. REF. 330.30

1.10 SPLICES: SPLICE ONLY IN ACCESSIBLE JUNCTION BOXES, USING "WIRENUT" CONNECTORS FOR 8AWG AND SMALLER, OR MECHANICAL COMPRESSION CONNECTORS WITH INSULATION KIT FOR 6AWG AND LARGER.

1.11 BOXES: NEMA OS1 IN INTERIOR DRY LOCATIONS, CAST WEATHERPROOF TYPE IN WET LOCATIONS.

1.12 RECESSED FLOOR BOXES: FLUSH, CAST SIZE AS INDICATED ON DRAWING. INSTALL CONCEALED BENEATH CASEWORK OR EQUIPMENT WITH PLASTIC COVER PLATE AND BRASS CARPET/TILE FLANGE. HUBBELL # PLASTIC FLOOR BOX #PFB1 WITH PLASTIC COVER #PFBCGY AND PLASTIC FLOOR ADAPTER #PFBA1, OR APPROVED EQUAL. HUBBELL #PFB1–PFBCGY–PFBA1.

1.13 POKE–THRU: STEEL CITY #PT–200 WITH PT–300 SERIES SERVICE FITTING HEAD OR HUBBELL APPROVED EQUAL.

1.14 WALL SWITCHES: FED SPEC W–S–896, AC GENERAL USE, 20 AMP, 120–277 VOLT, TOGGLE HANDLE. INSTALL 48" A.F.F. TO CENTER. INSIDE DOOR ON WALL, KNOB/HANDLE SIDE OF DOOR. PROVIDE OCCUPANCY SENSOR SWITCHES FOR OFFICES AND DOUBLE SWITCH LARGER OPEN AREAS PER 2021 ENERGY CODE. LATEST ADOPTED REVISION .

1.15 WALL RECEPTACLES: FED SPEC W–C–596, NEMA 5–15R CONFIGURATION OR AS REQUIRED. PROVIDE IF (ISOLATED GROUND) AND GFCI/WP (GROUND–FAULT CIRCUIT INTERRUPTER) RECEPTACLES WHERE APPROPRIATE OR INDICATED. INSTALL 18" A.F.F. TO CENTER, OR AS INDICATED. REF. 210.8,210.63 . ALL KITCHEN OUTLETS GFI PER CODE. PROVIDE ARC FAULT C/B'S PER ARTICLE 210.12 IN SLEEPING AREAS.

1.16 WALL PLATES: SMOOTH PLASTIC–STAINLESS STEEL IN KITCHEN.

1.17 WALL DEVICE AND PLATE COLOR: MATCH ADJACENT SURFACE, OR AS DIRECTED BY ARCHITECT. PROVIDE ORANGE IG RECEPTACLES. RED EMERGENCY RECEPTACLES.

1.18 MULTI–OUTLET ASSEMBLY: PROVIDE WIREMOLD PLUGMOLD MODEL G20GBA512, GRAY COLOR, ALTERNATE WIRING, 12" SPACING, FIELD CUT AS REQUIRED. INSTALL PLUG STRIP FURNISHED BY TENANT, IF SO NOTED.

1.19 MANUFACTURED WIRING SYSTEMS: PERMITTED FOR BRANCH CIRCUITS SUBJECT TO APPROVAL OF TENANT, LANDLORD, AND LOCAL AUTHORITY.

1.20 GROUNDING: PROVIDE CONTINUOUS, PERMANENT, AND EFFECTIVE GROUNDING SYSTEM. GROUND SEPARATELY DERIVED SYSTEMS TO NEAREST EFFECTIVELY GROUNDED BUILDING STRUCTURAL STEEL. REF. 250–50,300.5 ,2021 NEC OR LATEST ADOPTED REVISION.

16400 – EQUIPMENT

4.01 DISCONNECT SWITCH: NEMA KS1, GENERAL DUTY, 3 POLE, S/N IF NEUTRAL IS PRESENT, 3R ENCLOSURE IF OUTDOORS, LOCK–OFF, NON–FUSIBLE UNLESS INDICATED WITH FUSES. REF. 230.70 1.1, AMENDED.

4.02 SWITCHBOARDS – SQ–D QED STYLE –SEE DRAWINGS FOR APPLICABILITY. "MDP" PANELS SQ D I–LINE HEAVY DUTY PANELS.

4.03 PANELBOARD: NEMA PB1 AS SCHEDULED, 20" WIDE SECTION, 225 AMP BUS (100 AMP BUS PERMITTED IF LESS THAN 30 BRANCH POLES). PROVIDE GROUND BUS FOR IG CIRCUITS. INSTALL PER NEMA PB1.1. BALANCE PHASE CURRENTS TO 10% MAXIMUM VARIATION. PROVIDE TYPEWRITTEN BRANCH CIRCUIT DIRECTORY. LOAD CENTERS NOT APPROVED. REUSE EXISTING IF APPLICABLE AND STILL MEETS CODE REQUIREMENTS. SQ–D OR TRUE EQUAL. PROVIDE AND INSTALL MVC SURGE PROTECTION PRIOR TO ENERGIZING PANELS. PH 800–583–4773 .

4.04 CIRCUIT BREAKER: NEMA AB1 AS SCHEDULED, BOLT–ON, CENTER TRIP, SWD IF SINGLE POLE, COMMON TRIP IF MULTI–POLE, HACR IF REQUIRED BY LOAD. MINIMUM INDIVIDUALLY RATED INSTALLED A/C: 277/480 VOLT – 10,000 A/C, 120/208 VOLT – 10,000 A/C. MATCH EXISTING EQUIPMENT WHERE APPLICABLE.

4.05 FUSE: UL CLASS RK5–R. PROVIDE 3 SPARE OF EACH SIZE AND TYPE.

4.06 MAGNETIC MOTOR STARTER: NEMA ICS2, FVNR, SIZE PER MOTOR REQUIREMENTS BUT SIZE 0 MINIMUM, 3R ENCLOSURE IF OUTDOORS. PROVIDE CLASS 20 HEATERS PER ACTUAL MOTOR NAMEPLATE DATA. PROVIDE 120VAC OR 24VAC FUSED CONTROL CIRCUIT AS REQUIRED. SQ–D OR EQUAL.

4.07 MANUAL MOTOR STARTER: NEMA RATED, FHP, SINGLE SPEED, TOGGLE OPERATED, MANUAL RESET OVERLOAD, NEMA 1 ENCLOSURE.

4.08 CONTACTOR: ASCO 917 SERIES, ELECTRICALLY OPERATED, MECHANICALLY HELD, CONFIGURED FOR 2–WIRE CONTROL, OR EQUAL. REFER TO CONTACTOR SCHEDULE FOR NUMBER OF POLES AND CONTROL.

4.09 TIME SWITCH: PARAGON MODEL EC71/30S, OR APPROVED EQUAL, 7–DAY, 30 SETPOINT, 100 HOUR RIDE THROUGH.

– LIGHTING

5.01 TENANT – FURNISHED EQUIPMENT: FOR LIGHT FIXTURES AND AUXILIARY ITEMS SCHEDULED AS FURNISHED BY TENANT, RECEIVE, PROTECT, INSTALL, CLEAN, AND LAMP LIGHT FIXTURES AS SCHEDULED, OR EQUAL.

5.02 CONTRACTOR – FURNISHED EQUIPMENT: FOR LIGHT FIXTURES SCHEDULED AS FURNISHED BY CONTRACTOR, FURNISH AND INSTALL COMPLETE, OR APPROVED EQUAL.

5.03 ACCESSORIES: PROVIDE ACCESSORIES, INCIDENTAL MATERIALS AND MOUNTING HARDWARE AS REQUIRED.

5.04 LOCATION: REFER ALSO TO ARCHITECTURAL DRAWINGS FOR FIXTURE LOCATIONS AND MOUNTING DETAILS.

5.05 INSTALLATION: PROPERLY INSTALL AND SUPPORT ALL FIXTURES PLUMB AND TRUE, AND FREE OF LIGHT LEAKS. CONFORM TO MANUFACTURER'S RECOMMENDATIONS AND INDUSTRY PRACTICE. LEAVE PROTECTIVE FILM IN PLACE ON FIXTURES UNTIL FINAL CLEAN–UP. INSTALL LIGHT FIXTURES IN RATED CEILINGS TO MAINTAIN THE RATING OF CEILING.

5.06 EMERGENCY LIGHTING: PROVIDE AND LOCATE EMERGENCY LIGHTING TO MEET LOCAL REQUIREMENTS AT EXITS AND TO ILLUMINATE EGRESSWAYS.

5.07 FLUORESCENT FIXTURES: IF FURNISHED BY CONTRACTOR, PROVIDE ELECTRONIC HPF, RAPID START, PARALLEL LAMP OPERATION, CBM, TYPE 1, CLASS P, SOUND RATED A, THD<20%, CCF<1.5, NAECA COMPLIANT WHERE APPLICABLE, ENERGY SAVING BALLASTS. LSI OR EQUIVALENT.

5.08 RECESSED INCANDESCENT FIXTURES: IF FURNISHED BY CONTRACTOR, PROVIDE FMC AND 150 DEGREE C FIXTURE WIRE FROM LAMP HOUSING TO INDEPENDENT BRANCH CIRCUIT OUTLET BOX. LITHONIA, HACO, OR EQUIVALENT.

5.09 HID FIXTURES: IF FURNISHED BY CONTRACTOR, PROVIDE ANSI C82.4 COMPLIANT, HPF, ENCAPSULATED BALLASTS, ADVANCE SERIES 73B OR EQUAL. ABOLITE OR EQUIVALENT, LSI OR EQUIVALENT.

5.10 FINAL ADJUSTMENT: AFTER TRADE FIXTURES ARE INSTALLED BY OTHERS, CLEAN ALL LIGHTING FIXTURES, REPLACE ALL EXPIRED LAMPS, AND ADJUST DIRECTIONAL LIGHTING AS DIRECTED BY TENANT AND ARCHITECT.

5.11 SIGN DISCONNECT: PROVIDE DISCONNECT SWITCH IN ACCESSIBLE CEILING SPACE FOR SIGNAGE AND MAKE FINAL CONNECTIONS. VERIFY LOCATION IN FIELD. SIGN FURNISHED AND INSTALLED BY OTHERS. VERIFY VOLTAGE AND CIRCUIT QUANTITY.

5.12 LABEL PANELS: PROVIDE PERMANENT LABEL FOR PANELS INCLUDING FAULT CURRENT VALUE SHOWN ON PANEL SCHEDULE. INCLUDE INTEGRATED SYSTEM RATING ON LABEL FOR FIELD REFERENCE.

– SYSTEMS

7.01 FIRE ALARM SYSTEM: FURNISH, INSTALL, CONNECT AND TEST A FULLY–FUNCTIONAL NEW FIRE ALARM INTERFACED TO MAIN ALARM. PROVIDE, WHERE INDICATED, DEVICES APPROVED BY THE OPERATOR OF THE EXISTING BUILDING SYSTEM AND COMPLY WITH ALL REQUIREMENTS. COORDINATE SYSTEM IF REQUIRED BY FIRE MARSHALL . OC MUST USE OWNER'S FIRE ALARM CONTRACTOR (@ OWNER'S EXPENSE), SEE "LANDLORD REQUIRED CONTRACTORS" DOCUMENT FOR TENANTS. PROVIDE SHOP DRAWINGS BY LICENSED FIRE ALARM CONTRACTOR.

7.02 DUCT SMOKE DETECTORS; CONNECT DUCT SMOKE DETECTORS FURNISHED AND INSTALLED BY DIVISION 15 TO FIRE ALARM SYSTEM AS REQUIRED. INSTALL AND CONNECT TEST STATIONS FURNISHED BY DIVISION 15.

7.03 AREA SMOKE DETECTORS: PROVIDE COMPATIBLE AREA PHOTOELECTRIC SMOKE DETECTORS AS INDICATED AND REQUIRED BY FIRE MARSHALL AT ELEVATORS, CORRIDORS, AND SLEEPING AREAS PER NFPA.

7.04 INDICATING APPLIANCES: PROVIDE ADA COMPLIANT HORN/STROBE UNITS AS INDICATED AND REQUIRED. COMPLY WITH T.A.S./A.D.A. REVIEW COMMENTS. COMPLY WITH TABLE 7.5.4.1.1 (A) 2021 NFPA 72 FOR PROPER CANDELA RATINGS COVERAGE. AN EXISTING SYSTEM NEEDS TO BE ADJUSTED FOR NEW WALL.

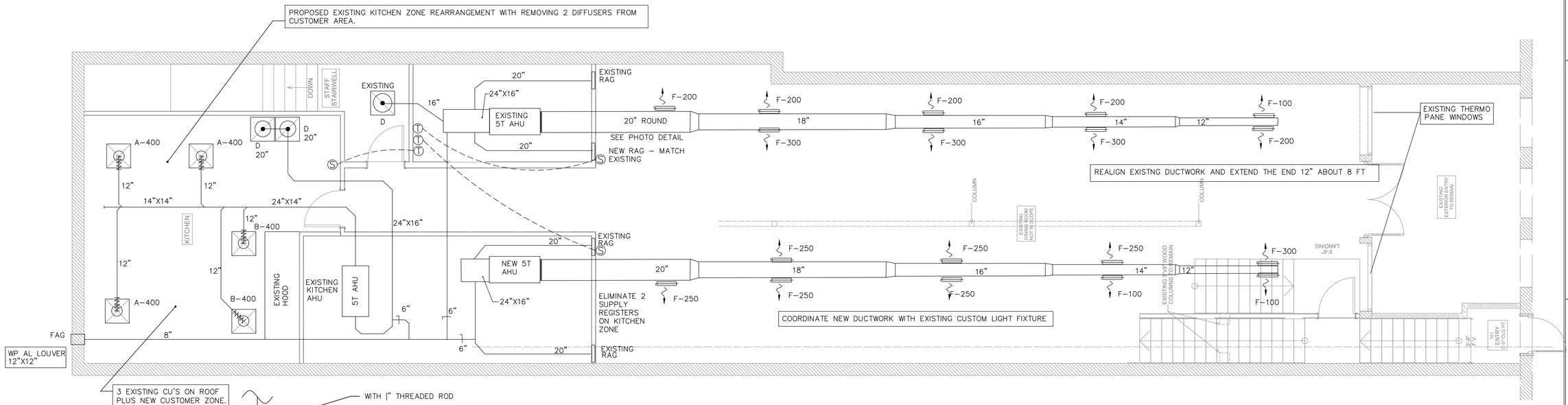
7.05 SECURITY SYSTEM ROUGH–IN: PROVIDE CONTINUOUS RACEWAY SYSTEM WITH PULL WIRE AS INDICATED FOR INSTALLATION OF SECURITY SYSTEMS BY OTHERS.

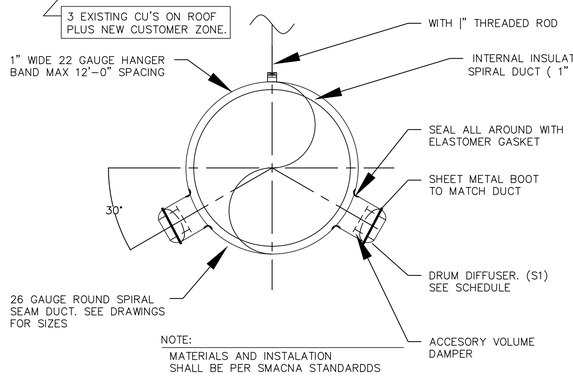
7.06 TELEPHONE SYSTEM ROUGH–IN: PROVIDE DEDICATED CONTINUOUS 3/4" MINIMUM EMT RACEWAY SYSTEM WITH PULL WIRE FROM MAIN INCOMING AT BACKBOARD, TO ALL TELEPHONE OUTLETS. COORDINATE LOCATIONS WITH UNDER FLOOR SERVICES.

7.07 DATA SYSTEM ROUGH–IN: PROVIDE DEDICATED CONTINUOUS 3/4" MINIMUM EMT RACEWAY SYSTEM WITH PULL WIRE FROM DATA SYSTEM EQUIPMENT LOCATION TO ALL DATA SYSTEM OUTLETS. FOR NON–PLENUM ACCESSIBLE CEILING SPACES, AND WHERE APPROVED BY TENANT, LANDLORD, AND LOCAL AUTHORITY, BUSHED RACEWAY STUBS FROM OUTLET BOXES TO CEILING SPACE ARE PERMITTED IN LIEU OF CONTINUOUS SYSTEM. FOR WALL OUTLETS PROVIDE 4" SQUARE OUTLET BOX WITH SINGLE GANG ADAPTER RING AND BLANK PLATE. FOR FLOOR OUTLET PROVIDE FLOOR BOX AS ELSEWHERE SPECIFIED AND BLANK PLATE.

GENERAL ELECTRICAL NOTES

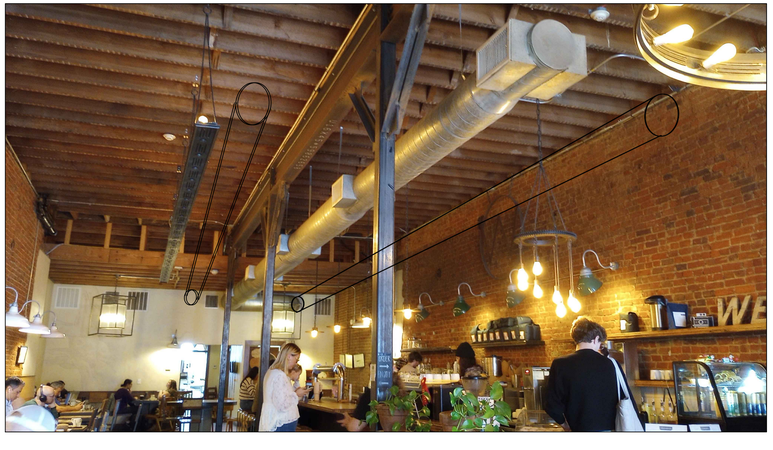
1. ALL CORE BORING OR TRENCHING AND PATCHING OF EXISTING CONCRETE SLAB FLOOR AS REQUIRED FOR THE INSTALLATION OF THE ELECTRICAL SYSTEMS SHOWN SHALL BE BY THE ELECTRICAL CONTRACTOR. PAINT ALL PATCHING TO MATCH ADJACENT EXISTING SURFACES.
2. ALL CUTTING AND PATCHING OF THE ROOF AS REQUIRED OR THE INSTALLATION OF THE ELECTRICAL SYSTEMS SHOWN SHALL BE BY THE LANDLORD'S ROOFING CONTRACTOR, PAID FOR BY THE TENANT'S ELECTRICAL CONTRACTOR, UNLESS NOTED OTHERWISE.
3. EXISTING EQUIPMENT, DEVICES, CONDUIT AND WIRING MAY BE RE–USED WHERE APPLICABLE, UNLESS NOTED OTHERWISE.
4. REMOVE ALL EQUIPMENT, DEVICES, WIRING AND EXPOSED CONDUIT NOT BEING RE–USED.
5. VERIFY WITH LANDLORD/OWNER IF CONCEALED CONDUIT NOT BEING RE–USED. MAY BE ABANDONED IN PLACE IF APPROVED BY LANDLORD/OWNER ON REMODEL.
6. SPECIFIC CIRCUITS WERE CHOSEN IN ACCORDANCE WITH INFORMATION AVAILABLE, IN ORDER TO CORRESPOND TO THE EXISTING INSTALLATION. ELECTRICAL CONTRACTOR SHALL MAKE MAXIMUM PRACTICAL USE OF EXISTING CONDUIT AND WIRING AND MAY RE–ASSIGN CIRCUITS AS REQUIRED. PROVIDE A TYPEWRITTEN CIRCUIT DIRECTORY IN PANEL–BOARD DOOR(S).
7. WHERE EXTRA HOME RUNS ARE SHOWN FOR CLARITY, ROUTE CONDUIT AND WIRE PER FIELD REQUIREMENTS.
8. ELECTRICAL CONTRACTOR SHALL VERIFY ALL VOLTAGES OF MECHANICAL EQUI





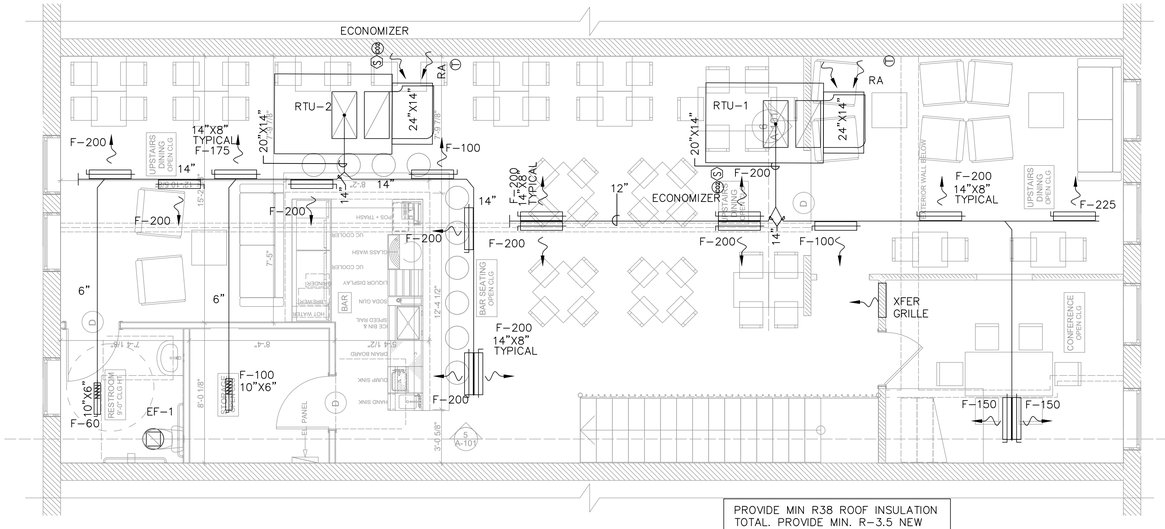
2 SPIRAL DUCT–MATCH EXISTING

SCALE: NONE NEW DUCTWORK AND REWORK REQUIRED.



3 SPIRAL DUCT– REALIGNED

SCALE: NONE



1 HVAC PLAN

SCALE: 1/4" = 1'–0"

MECHANICAL NOTES

1. INSTALL FIRE DAMPERS (F.D.) IN RATED ASSEMBLIES PER CODE. 2. EXISTING EF'S SWITCHED WITH RESTROOM LIGHTS .
2. LINE RETURN AIR DUCTWORK TO CONTROL NOISE. XFGRILL=TRANSFER GRILLE.
3. INSTALL RTU'S ON FACTORY CURBS, WITH VIBRATION ISOLATION., FOR UPSTAIRS NEW BAR.
4. CLOSELY COORDINATE EQUIPMENT LOCATIONS, DUCT CLEARANCES, SIZES AND ROUTING WITH THE ARCHITECT, STRUCTURE AND LIGHTS. PROVIDE OFFSETS AND EQUIVALENT DUCT SIZES AS REQUIRED.
5. WHEN OFFSETS ARE REQUIRED TO ROUTE DUCTWORK (AROUND PIPING, STRUCTURE, OR OTHER DUCTWORK, ETC.) PROVIDE 45 DEGREE ELBOWS IN LIEU OF 90 DEGREE ELBOWS, WHERE POSSIBLE.
6. PROVIDE 18" X 18" ACCESS PANEL FOR ALL DAMPERS IF NOT ACCESSIBLE.
7. SLOPE CONDENSATE DRAINS 1/8" PER FOOT. COORDINATE WITH PLUMBING.
8. MAINTAIN A MINIMUM OF 10' FOR OUTSIDE AIR OPENINGS FROM EXHAUST OPENINGS.
9. ROUND RIGID GALVANIZED DUCT OR FLEXIBLE DUCT RUNOUTS TO AIR DEVICES SHALL BE ROUTED THRU JOIST SPACE, WHERE NECESSARY.
10. DUCT SIZES SHOWN ARE FOR NET FREE AREA. INSULATION IS NOT INCLUDED.
11. PROVIDE CO2 SENSORS TO MODULATE FRESH AIR TO TRACK PEOPLE LOAD ON RTU'S UPSTAIRS.
12. REPLACE EXISTING CONDENSING UNITS AND AHU EVAPORATORS FOR MIN 14.3 SEER.
13. PROVIDE ROOF INSULATION ASSEMBLY MINIMUM OF R–38. PROVIDE NEW THERMAL WINDOWS FOR THE TOP FLOOR EXPANSION (MIN R–3.5). EXPECT THE CUSTOM WINDOWS TO HAVE LONGER LEAD TIMES.
14. RTU–1,2 CONDENSATE TO SINK TRAP.
15. SERVICE THE BASEMENT HVAC SYSTEM SERVING THE OFFICES BELOW THE KITCHEN LEVEL AND BACK.

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02.12.2025

PERMIT, PRICING & CONSTRUCTION SET

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WEST OAK COFFEE SHOP

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REVISIONS

HVAC PLAN

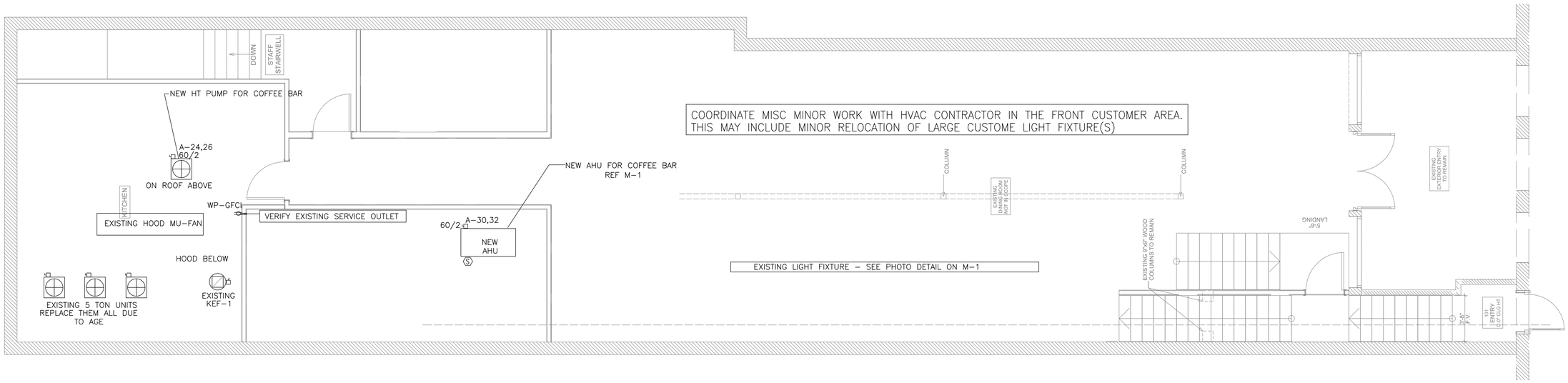
ISSUE DATE:

Scale:

Drawn: JB

Job: 19-057-001

Sheet Number: M–1



FED THRU FUSED DISCONNECT

PANEL: A .NQOD STYLE

FEED THRU LUGS

4 W.120 /208 VOLTS 3 PHASE MOUNTING SURFACE ___ FLUSH X

FEEDER 4-3/0 CU + G CONDUIT 2"C PANEL POLES 42

MAIN C/B 200 / 200 AMPS INTEGRATED SYSTEM RATING: 42,000 AMPS

CCT. NO:	SERVICE DESCRIPTION	WIRE & CONDUIT	WATTS	POLE	AMPS	LTS	C.O.	A B C	CCT. NO:	LTS	C.O	POLE	AMPS	WATTS	WIRE & CONDUIT	SERVICE DESCRIPTION
1	OUTLETS	2#12,3/4"C,+EG	1000	1	20				2			1	20	400	2#12,3/4"C,+EG	LIGHTS
3	OUTLETS - HOT WATER	2#12,3/4"C,+EG	1000	1	20				4			1	20	400	2#12,3/4"C,+EG	LIGHTS
5	OUTLETS - POS	2#12,3/4"C,+EG	1000	1	20				6			1	20	1200	2#12,3/4"C,+EG	OUTLET
7	OUTLETS	2#12,3/4"C,+EG	1000	1	20				8			1	20	1000	2#12,3/4"C,+EG	OUTLET
9	OUTLETS	2#10,3/4"C,+G	1000	1	20				10			1	20	800	2#12,3/4"C,+EG	OUTLET
11	OUTLETS	2#12,3/4"C,+EG	1200	1	20				12			1	20	200	2#12,3/4"C,+EG	OUTLET
13	OUTLETS	2#12,3/4"C,+EG	1200	1	20				14			1	20	800	2#12,3/4"C,+G	OUTLET
15	OUTLETS	2#12,3/4"C,+EG	1100	1	20				16			2	30	1000	2#10,3/4"C,+G	BREWER
17	OUTLETS	2#12,3/4"C,+EG	1000	1	20				18				30	1000		
19	OUTLETS	2#12,3/4"C,+EG	1000	1	20				20			1	20	800	2#12,3/4"C,+EG	T.B.D.
21	OUTLETS GLASS WASHER	2#10,3/4"C,+EG	1600	2	30				22			1	20	800	2#12,3/4"C,+EG	T.B.D.
23			1600		30				24			2	50	2600	2#6 ,3/4"C+EG	NEW 5T CU FOR COFFEE BAR
25	SPARE			1	20				26				50	2600		
27	SPARE			1	20				28			1	20			SPARE
29	SIGN - OPEN	2#12,3/4"C,+G	600	1	20				30			2	60	4250	2#6 ,3/4"C+EG	NEW COFFEE BAR AHU
31	SIGNS	2#12,3/4"C,+EG	700	1	20				32				60	4250		7.5 KW BOOST ELECTRIC HEAT
33	RTU-1 4 TON	3#8 ,3/4"C+EG	1800	3	35				34			3	35	1800	3#8 ,3/4"C+EG	RTU-2 4 TON
35	GAS HEAT		1800						36				35	1800		GAS HEAT
37			1800						38				35	1800		
39	SPARE			1	20				40			3	30			FUTURE ADA LIFT
41	SPARE			1	20				42				30			
43	SPARE			1	20				44				30			
45	SPARE			1	20				46							
47	SPARE			1	20				48							
49	SPARE			1	20				50							
51	SPARE			1	20				52							
53	SPARE			1	20				54							

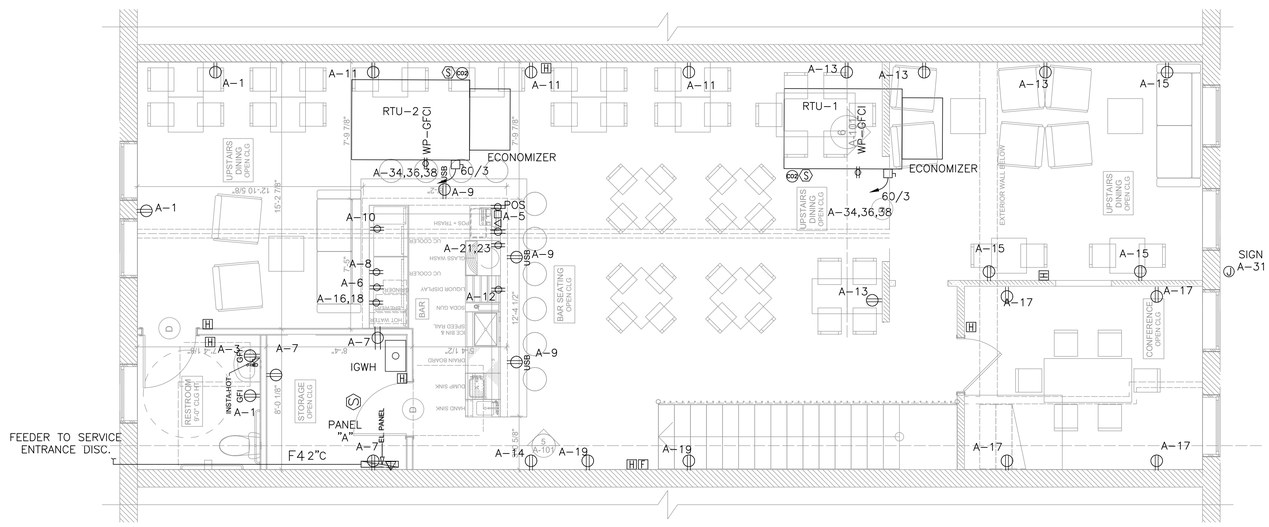
WATTS 47,700 TOTAL CONNECTED WATTS

CONTINUOUS	800	1.25	1,000
NON-CONTINUOUS	17,000	10k+50%	13,500
KITCHEN	5,400	0.65	3,510
COOLING	10,800btu 13700 split HP	1.00	24,500
TOTAL DIVERSIFIED WATTS		-	42,510
TOTAL DIVERSIFIED LOAD AMPS			118 AMPS

18,350
11,100
18,250
winter peak

NOTES: SEE NOTE 1 FOR SIGNAGE COORDINATION

PANEL SUMMARY IS LOAD SUMMARY



NEW UPSTAIRS BAR EQUIPMENT SCHEDULE

NO.	ITEM NAME	QTY.	MANUFACTURER	MODEL	DIMENSIONS WIDTH	DEPTH	HEIGHT	WEIGHT	COLD WATER	HOT WATER	DRAIN	GAS SUPPLY	MECHANICAL SUPPLY	EXHAUST	DUCT SIZE	H.P.	ELECTRIC SERVICE VOLT.	PHASE	AMP	NEMA CONFIG.	REMARKS
01	CABINET, P.O.S.	1	GLASTENDER	PCB-24	24"	24"	37"														
02	COFFEE BREWER	1	CURTIS	G4TP1S63B3100	11.13"	20.75"	24.75"		X	X		-	-	-	-	-	120/220	1	13.8/12.2	-	
03	COFFEE GRINDER	1	MAHLKONIG	EK43 S																	
04	COOLER, UNDER COUNTER	1	GLASTENDER	C1FBT2	72"	24 1/8"	36"		-	-	-	-	-	-	-		120	1	15	5-15P	
05	DRAIN BOARD, W/ GLASS RACK	1	GLASTENDER	DBGR-18	18"	24"	37"														
06	DUMP SINK, W/ DRAIN BOARD	1	GLASTENDER	SWB-18-DB	18"	24"	37"														
07	GLASS WASHER	1	GLASTENDER	GD24HT	24 1/4"	26 7/8"	36 1/4"	281 lb		X	5/8"	-	-	-	-	3/4	60	1			
08	HAND SINK, W/ PAPER TOWEL DISPENSER	1	GLASTENDER	HSB-12-AD	12"	24"	37"														
09	HOT WATER DISPENSER	1	CURTIS	G3 W8SNB	7.5"	24 3/8"	25.75"		X	X		-	-	-	-		120/220	1	12.5/22.7		
10	ICE BIN, W/ SPEED RAIL	1	GLASTENDER	IBA-24	24"	24"	37"														
11	LIQUOR DISPLAY, W/ SPEED RAIL	1	GLASTENDER	LDB-18S	18"	24"	37"														
12	SODA GUN	1	GLASTENDER	SHB-6	6"	24"	21"														

1 POWER PLAN
SCALE: 1/4" = 1'-0"

NOTES:

1. WALKIN COMPRESSORS, HOOD EXHAUST , HOOD MAKEUP FANS COORDINATED TO COMPLY WITH 10 FT RULE FOR EXHAUST FANS AND FRESH AIR INLETS WITH NEW HOOD AND OTHER ROOF EQUIPMENT. ADA LIFT IS ADD ALTERNATE.
2. VERIFY LOCATION OF DENTON F.D. KNOX BOX FOR FIRE DEPARTMENT ACCESS TO ELECTRICAL EQUIPMENT. MAIN DISCONNECT IS OUTSIDE IN REAR SEE E-3.
3. MAX TV POWER IS ASSUMED 250 WATTS FOR SMALLER LED (50"-60")
4. TV OUTLETS AND CATV JACK MOUNTED ABOUT 84"-96" AFF. FIELD VERIFY WITH OWNER.
5. COORDINATE UNDER FLOOR CONDUITS AT BAR WITH WASTE AND WATER TRENCH.
6. AV/LAN LOCATION "▭△": COORDINATE HEIGHT WITH OWNER TYPICALLY FOR "POS" AND "ORDER" SYSTEM. FIELD VERIFY LOCATIONS WITH OWNER PRIOR TO ROUGH INS.
7. TV LOCATIONS "△#": FIELD VERIFY LOCATION - TYPICAL MOUNTING HEIGHT 78" A.F.F.
8. ALL KITCHEN, BAR,EXTERIOR AND RESTROOM OUTLETS ARE GFCI PER CODE. ****

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02.12.2025

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116 W. OAK STREET
DENTON, TX

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105 W. MAIN ST.
LEWISVILLE, TEXAS 75057
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REVISIONS

POWER PLAN

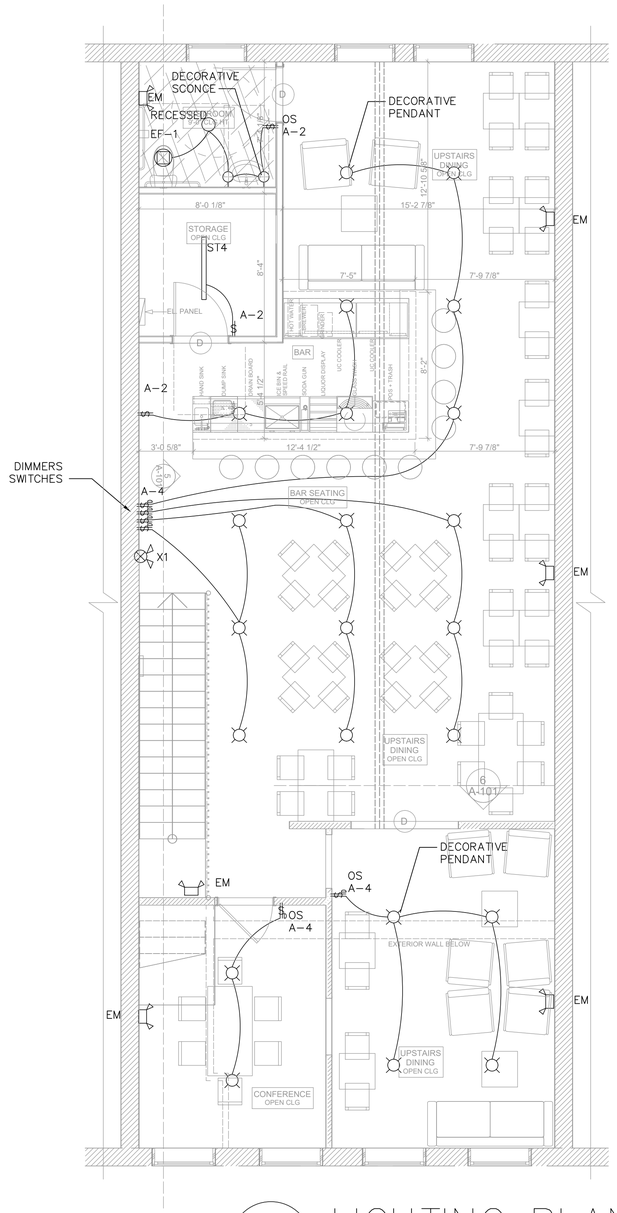
ISSUE DATE:

Scale:

Drawn: JB

Job: 19-057-001

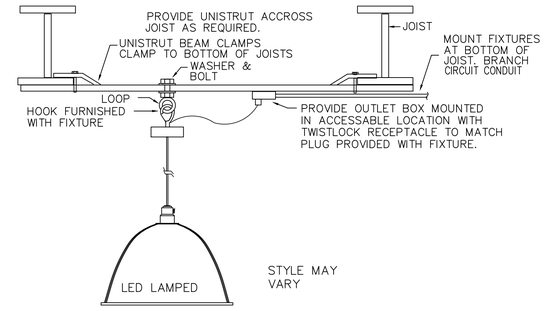
Sheet Number: E-1



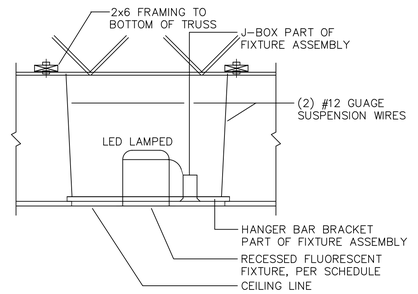
1 LIGHTING PLAN
SCALE: 1/4" = 1'-0"

NOTES:

1. VERIFY SWITCH AND DIMMER BANK LOCATIONS WITH OWNER PREFERENCE PRIOR TO ROUGHINS.
2. COORDINATE HOOD FANS SPEED CONTROL LOCATION WITH OWNER IN KITCHEN .
3. VERIFY SIGN LOCATIONS AND REQUIREMENTS WITH SIGN VENDOR.
4. EMERGENCY LIGHTING WIRED TO LIGHTING CIRCUITS IN THE IMMEDIATE AREA SERVED.
5. LIFE SAFETY SERVED ON NON SWITCHED LEG OF NEARBY CIRCUIT PER CODE.
6. REFERENCE ARCHITECTURAL FOR FIXTURE MODEL SELECTION AND LIGHT DIMENSIONS. REFERENCE COM CHECK REPORT FOR FIXTURE LAMP SIZES.
7. PROVIDE FIXTURE SUBMITTALS FOR REVIEW, PRIOR TO ORDERING LIGHT FIXTURES. PROVIDE GASKETED SHIELDED FIXTURES IN FOOD PREP AREAS WHERE APPLICABLE..
8. LIGHT FIXTURES: RECESSED AND SCONCES 13W LED; DECORATIVE PENDANTS 15W LED ON DIMMERS IN SERVING AREAS.
9. COORDINATE ANY LIGHT FIXTURE RELOCATIONS WITH HVAC AND ARCHITECT.



2 DECORATIVE PENDANT DETAIL
SCALE: N.T.S.



3 RECESSED DOWNLIGHT DETAIL
SCALE: N.T.S.

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EQUIPMENT PLAN

REVISIONS

ISSUE DATE:

Scale:

Drawn: JB

Job: 19-057-001

Sheet Number: E-2

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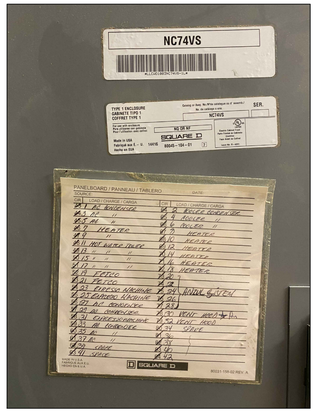
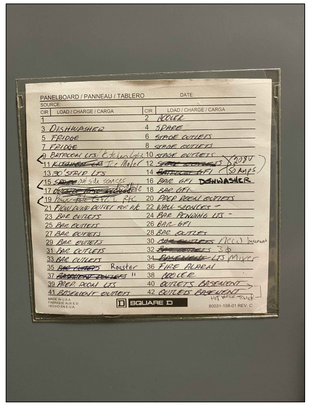
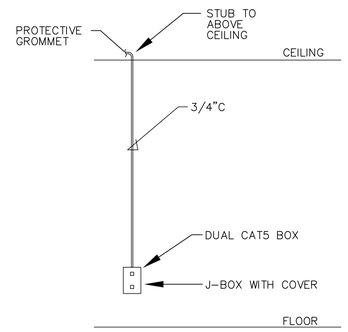




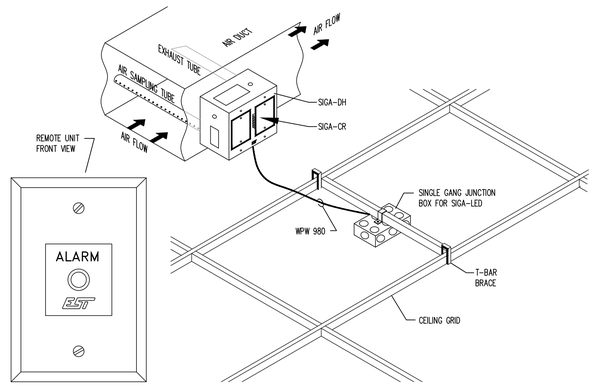
4 EXISTING PANELS – LOWER LEVEL

SCALE: N.T.S.



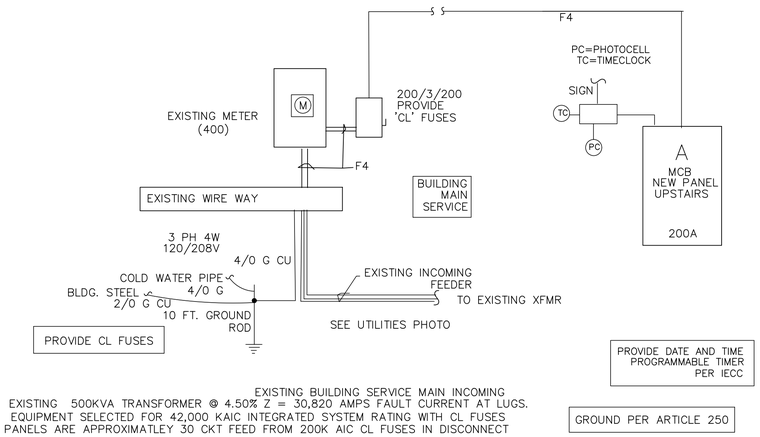
1 DETAIL–DUAL CAT6 BOX

SCALE: N.T.S. ⚠ = SYMBOL ON PLAN



2 DUCT DETECTOR AND REMOTE INDICATOR UNIT (ON CEILING)

SCALE: N.T.S. (MOUNTING DETAIL – TYPICAL)



EXISTING BUILDING SERVICE MAIN INCOMING
EXISTING 500KVA TRANSFORMER @ 4.50% Z = 30,820 AMPS FAULT CURRENT AT LUGS.
EQUIPMENT SELECTED FOR 42,000 KAIC INTEGRATED SYSTEM RATING WITH CL FUSES
PANELS ARE APPROXIMATLEY 30 CKT FEED FROM 200K AIC CL FUSES IN DISCONNECT

3 ELECTRICAL RISER DIAGRAM & EXISTING INCOMING SERVICE

SCALE: N.T.S. THIS WORK REQUIRES A NEW DISCONNECT FOR THE UPSTAIRS NEW PANEL

POWER FEEDER SCHEDULE AND WIRE AND CONDUIT SIZING CHART

REFERENCE ELECTRICAL SPECS FOR UPSIZING WIRE FOR VOLTAGE DROP OR ROOF TEMP ADJUSTMENT

BREAKER	15	20	25	30	35	40	45	50	60	70	80	90	100	125	150	175	200	225	250	300	350	400	450	500	600	700	800	1000	1200	1600	2000	2500	3000	4000
PHASE	#12	#12	#10	#10	#8	#8	#8	#8	#6	#4	#4	#2	#2	#1	#1/0	#2/0	#3/0	#4/0	#250 MCM	#350 MCM	#500 MCM	(2) #3/0	(2) #3/0	(2) #250 MCM	(2) #350 MCM	(2) #500 MCM	(3) #300 MCM	(3) #400 MCM	(4) #350 MCM	(5) #400 MCM	(6) #400 MCM	(7) #500 MCM	(8) #500 MCM	(11) #500 MCM
NEUTRAL	#12	#12	#10	#10	#8	#8	#8	#8	#6	#4	#4	#2	#2	#1	#1/0	#2/0	#3/0	#4/0	#250 MCM	#350 MCM	#500 MCM	(2) #3/0	(2) #3/0	(2) #250 MCM	(2) #350 MCM	(3) #500 MCM	(3) #300 MCM	(3) #400 MCM	(4) #350 MCM	(5) #400 MCM	(6) #400 MCM	(7) #500 MCM	(8) #500 MCM	(11) #500 MCM
GROUND	#12	#12	#10	#10	#10	#10	#10	#10	#10	#8	#8	#8	#8	#6	#6	#6	#6	#4	#4	#4	#2	(2) #2	(2) #2	(2) #2	(2) #1/0	(2) #1/0	(3) #1/0	(3) #2/0	(4) #3/0	(5) #4/0	(6) #250 MCM	(7) #350 MCM	(8) #400 MCM	(11) #500 MCM
CONDUIT	1/2"	1/2"	3/4"	3/4"	1"	1"	1"	1"	1"	1-1/4"	1-1/4"	1-1/4"	1-1/4"	1-1/2"	2"	2"	2"	2-1/2"	2-1/2"	3"	4"	(2) 2-1/2"	(2) 2-1/2"	(2) 2-1/2"	(2) 3"	(2) 4"	(3) 3"	(3) 3"	(4) 3"	(5) 3"	(6) 3"	(7) 4	" (8) 4"	(11) 4"
SERVICE FEEDER TAG									F1				F2		F3		F4	F5	F6	F7	F8	F9		F10		F11	F12	F13	F14					

(*) INDICATES NUMBER OF PARALLEL SETS
NOTE: UNLESS OTHERWISE INDICATED ON THE DRAWINGS, ALL COPPER CONDUCTORS AND CONDUIT SHALL BE SIZED FROM THIS CHART

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DETAILS & SCHEDULES

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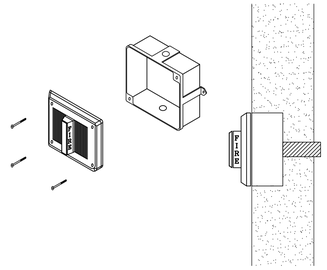
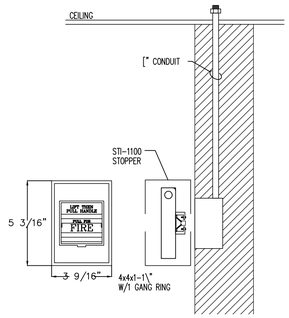


1 HORN/STROBE OUTDOOR FLUSH MOUNT
SCALE: N.T.S. (MOUNTING DETAIL – TYPICAL)



2 MANUAL PULL STATION
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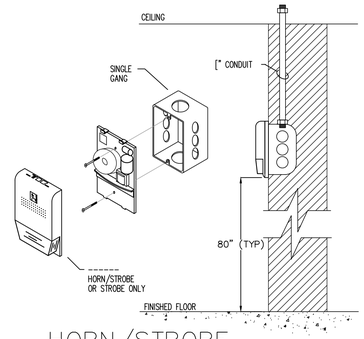
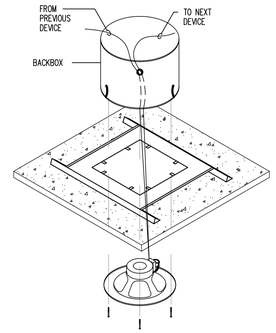
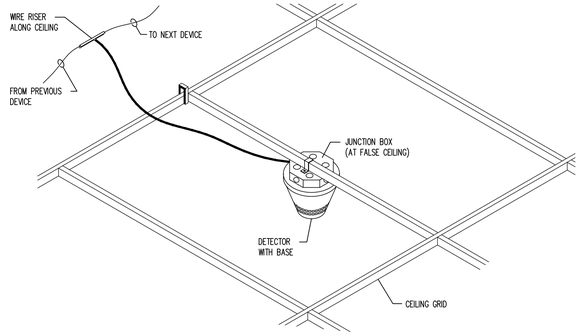


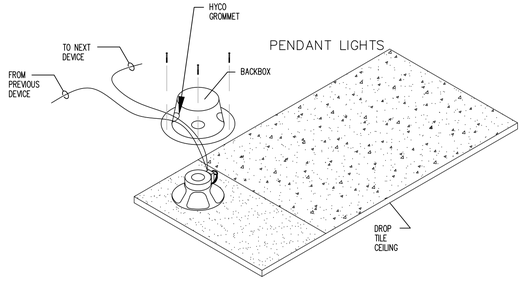
3 HORN/STROBE OR STROBE ONLY
SCALE: N.T.S. (MOUNTING DETAIL – TYPICAL)



4 FLUSH COAXIAL SPEAKER
SCALE: N.T.S. (MOUNTING DETAIL – TYPICAL)



5 SMOKE/HEAT DETECTOR
SCALE: N.T.S. (MOUNTING DETAIL – TYPICAL)



6 FLUSH CEILING SPEAKER
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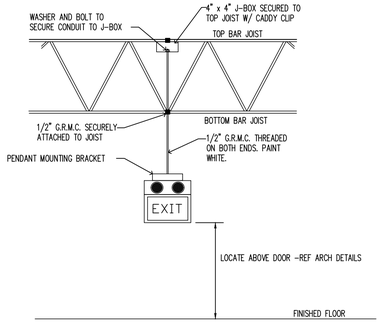
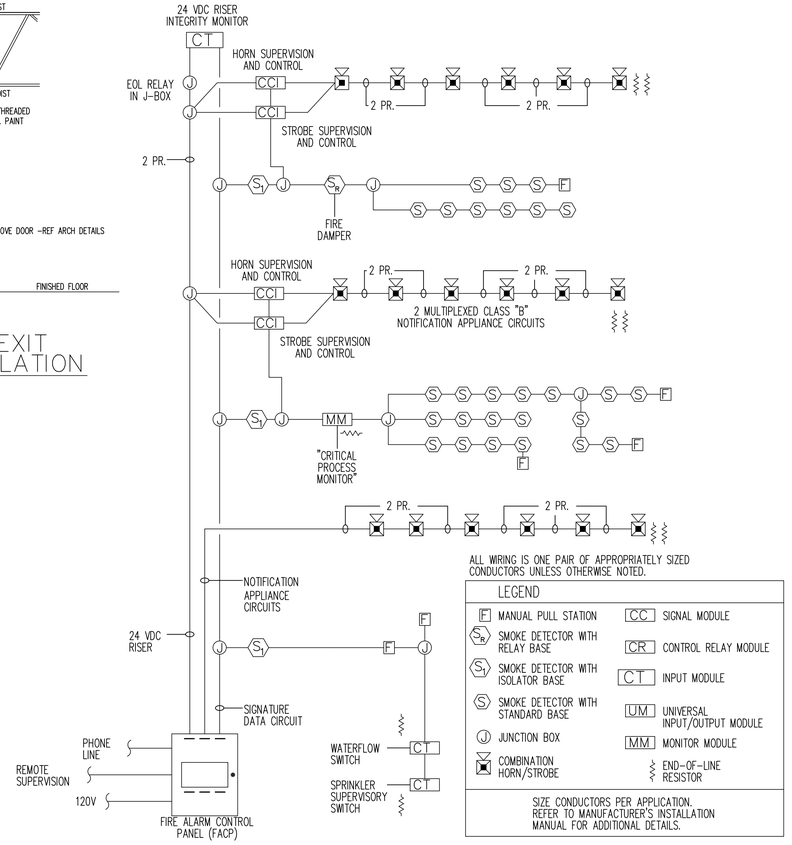


7 EMERGENCY/EXIT LIGHT INSTALLATION
SCALE: N.T.S.



PROVIDE SHOP DRAWINGS FOR FIRE ALARM BY LICENSED ALARM COMPANY FOR SUBMITTAL TO THE FIRE MARSHALL. ADD TO ALARM UPSTAIRS

8 SIMPLIFIED FIRE ALARM RISER
SCALE: N.T.S. GENERAL CONFIGURATION (NOT ALL DEVICES NECESSARILY APPLY)

LIGHT FIXTURE SCHEDULE

FIXTURE DESIG.	DESCRIPTION	LAMPS	MFGR & MODEL NO.	REMARKS
SC	KITCHEN–BAR SCONCE	11W LED	SELECTED BY OWNER – ARCHITECT	
P	PENDANT LIGHTS	13W LED	SELECTED BY OWNER – ARCHITECT	ALLOWANCE $ 150 EACH
C	RECESSED 6" DOWNLITE	13W LED	PRESCOLITE # CFR618EB–120 VOLT , HALO OR EQUAL, UE, LED LAMP	INTERIOR DOWNLITES
X1E	EXIT FIXT.	INCLUDED	EXTERIOR EGRESS FIXTURE – MATCH EXIT SIGN	EXISTING BY LL
EM	EMERGENCY FIXTURE	INCLUDED	CRESCENT, CELW–2E–120/277	ECLIPSE SERIES
X	EXIT FIXT.	INCLUDED	CSRW3–2E (CRESCENT) (RED LETTERS)	
X1	EXIT/UNIT COMBO FIXT.	INCLUDED	CRESCENT–CCRW3–2E (RED LETTERS)	

** VERIFY EXACT FIXTURE TYPE WITH ARCHITECT BEFORE INSTALLING

NOTE: SOME FIXTURE TYPES SHOWN MAY NOT BE USED

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WEST OAK COFFEE SHOP

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REVISIONS

DETAILS

ISSUE DATE:

Scale:

Drawn: JB

Job: 19-057-001

Sheet Number:

E–4

02.12.2025

PERMIT, PRICING & CONSTRUCTION SET

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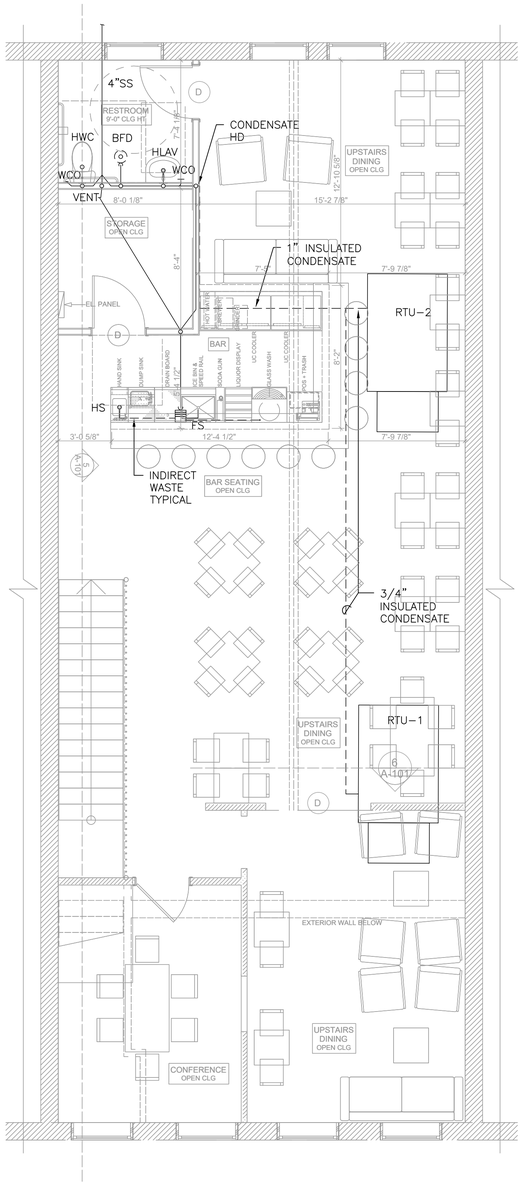
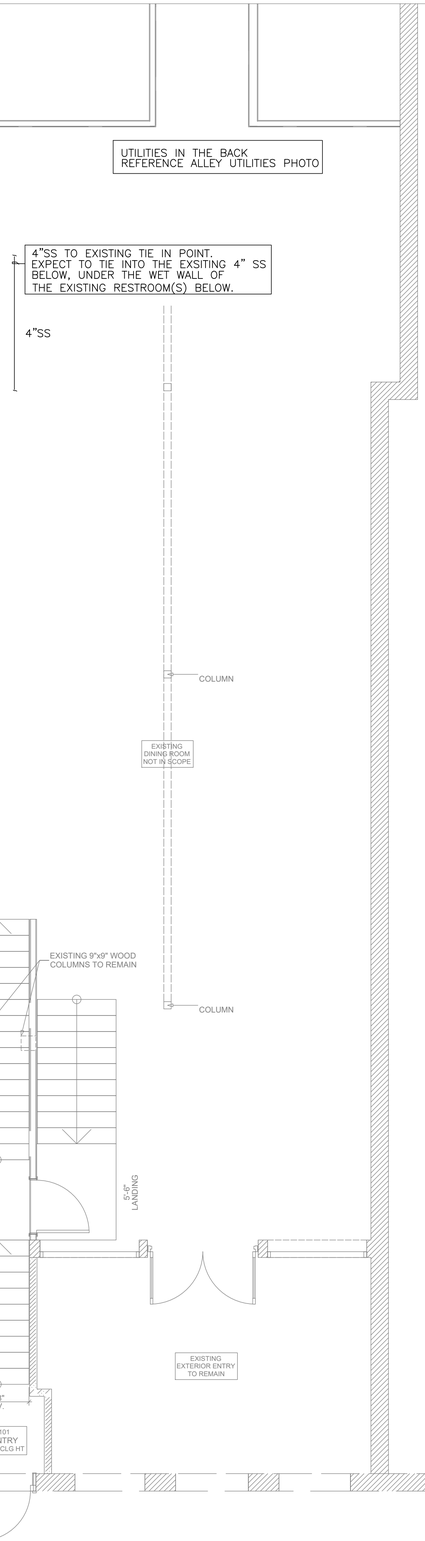
PREPARE SAW CUT TRENCHES
MINIMUM 24" WIDE, DOWEL REBAR
BACK INTO UNDISTURBED SLAB min 6"
WITH 3500 PSI MINIMUM MIX CONCRETE.
USE 4000 PSI MINIMUM MIX CONCRETE
IN PARKING LOT. USE SAME SIZE REBAR





1 PLUMBING PLAN – WASTE
SCALE: 1/4" = 1'–0"WORK ON 2ND FLOOR–ROOF ABOVE

NOTES:
1. REFERENCE SPECIFICATIONS, SHEET MEP – 2 .
2. COORDINATE CONNECTIONS WITH EXISTING WASTE LINE. MAIN FLOOR IS LEAVE OUT.
3. INSULATE CONDENSATE LINES WITH MINIMUM R–4 INSULATION .
4. PROVIDE RPZ BACK FLOW PREVENTORS FOR ALL HARD PIPED APPLIANCES AND EQUIPMENT PER CODE .
5. INSULATE ALL WATER LINES PER LATEST APPROVED EDITION OF PLUMBING CODE .
6. HEAT TRACE INSULATED HOT WATER PIPING PER CODE.
7. ALTERNATE TO ROUND FLOOR DRAIN – SQUARE FLOOR DRAIN .
8. REFERENCE EQUIPMENT SCHEDULE ON SHEET E–1 .
9. REFERENCE MEP–2 FOR WASTE PIPING AND WATER PIPING SPECIFICATIONS, INCLUDING CAST IRON AND SCHED 40 PVC. WATER PIPING –TYPE L OR XLINK POLY (PEX) OF ANY COMBINATION MEETING ASTM 876 / 877 CSA B137.10 STANDARDS PER CODE.
10. ROUTE RTU INSULATED CONDENSATE TO MOP SINK WITH AIR GAP.
11. PLUMBING WORK FOR THIS PROJECT INCLUDES SOME GAS PIPING AND NEW FIXTURES.
12. FIELD VERIFY BEST TIE IN POINT FOR RR WASTE LINE. DO NOT CUT FRONT GRADE BEAM.
13. PROVIDE FLOOR DRAIN LOCATIONS AS SHOWN AND PER 2021 IPC.
14. PROVIDE SEDIMENT TRAP INCLUDING BUCKET TYPE FLOOR DRAINS

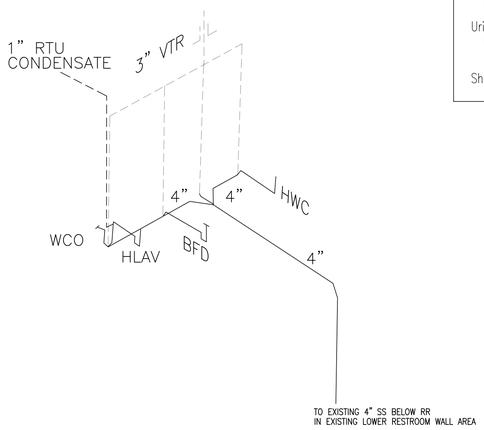
EQUIPMENT SCHEDULE

NO.	ITEM NAME	QTY:	MANUFACTURER	MODEL	DIMENSIONS WIDTH	DEPTH	HEIGHT	WEIGHT	COLD WATER	HOT WATER	DRAIN	GAS SUPPLY	MECHANICAL SUPPLY	EXHAUST	DUCT SIZE	H.P.	ELECTRIC SERVICE VOLT.	PHASE	AMP.	NEMA CONFIG.	REMARKS
01	CABINET, P.O.S.	1	GLASTENDER	PCB-24	24"	24"	37"														
02	COFFEE BREWER	1	CURTIS	G4TP1563B3100	11.13"	20.75"	24.75"		X	X		-	-	-	-	-	120/220	1	13.8/12.2	-	
03	COFFEE GRINDER	1	MAHLKONIG	EK43 S																	
04	COOLER, UNDER COUNTER	1	GLASTENDER	C1FB72	72"	24 1/8"	36"		-	-	-	-	-	-	-		120	1	15	5-15P	
05	DRAIN BOARD, W/ GLASS RACK	1	GLASTENDER	DBGR-18	18"	24"	37"														
06	DUMP SINK, W/ DRAIN BOARD	1	GLASTENDER	SWB-18-DB	18"	24"	37"														
07	GLASS WASHER	1	GLASTENDER	GC04HT	24 1/4"	26 7/8"	36 1/4"	281 lb		X	5/8"	-	-	-	-	3/4	60	1			
08	HAND SINK, W/ PAPER TOWEL DISPENSER	1	GLASTENDER	HSB-12-AD	12"	24"	37"														
09	HOT WATER DISPENSER	1	CURTIS	G3 WBSNB	7.5"	24.38"	25.75"		X	X		-	-	-	-		120/220	1	12.5/22.7		
10	ICE BIN, W/ SPEED RAIL	1	GLASTENDER	IBA-24	24"	24"	37"														
11	LIQUOR DISPLAY, W/ SPEED RAIL	1	GLASTENDER	LDB-18S	18"	24"	37"														
12	SODA GUN	1	GLASTENDER	SHB-6	6"	24"	21"														

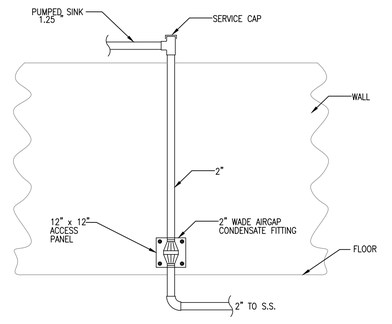
FIXTURE ROUGH–IN SCHEDULE

Rough–in fixture piping connections in accordance with following table of minimum sizes for particular fixtures.

	Hot Water	Cold Water	Waste	Vent
Lavatory	1/2 inch	1/2 inch	1–1/2 inch	1–1/4 inch
Service Sink	1/2 inch	1/2 inch	2 inch	1–1/2 inch
Sink	1/2 inch	1/2 inch	1–1/2 inch	1–1/4 inch
Drinking Fountain or EWC	---	1/2 inch	1–1/4 inch	1–1/4 inch
Water Closet (Flush Valve)	---	1 inch	4 inch	2 inch
Water Closet (Tank Type)	---	1/2 inch	4 inch	2 inch
Urinal (Flush Valve)	---	3/4 inch	2 inch	1–1/2 inch
Urinal (Tank Type)	---	1/2 inch	2 inch	1–1/2 inch
Showers	1/2 inch	1/2 inch	Floor Drain 2"	See Plans



2 REST ROOM RISER
SCALE: N.T.S.



3 HUB DRAIN FITTING DETAIL
SCALE: N.T.S.

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REVISIONS

PLUMBING WASTE

ISSUE DATE:

Scale:

Drawn: MW

Job: 24-220-001

Sheet Number: P–1

07.19.2024

PERMIT, PRICING & CONSTRUCTION SET

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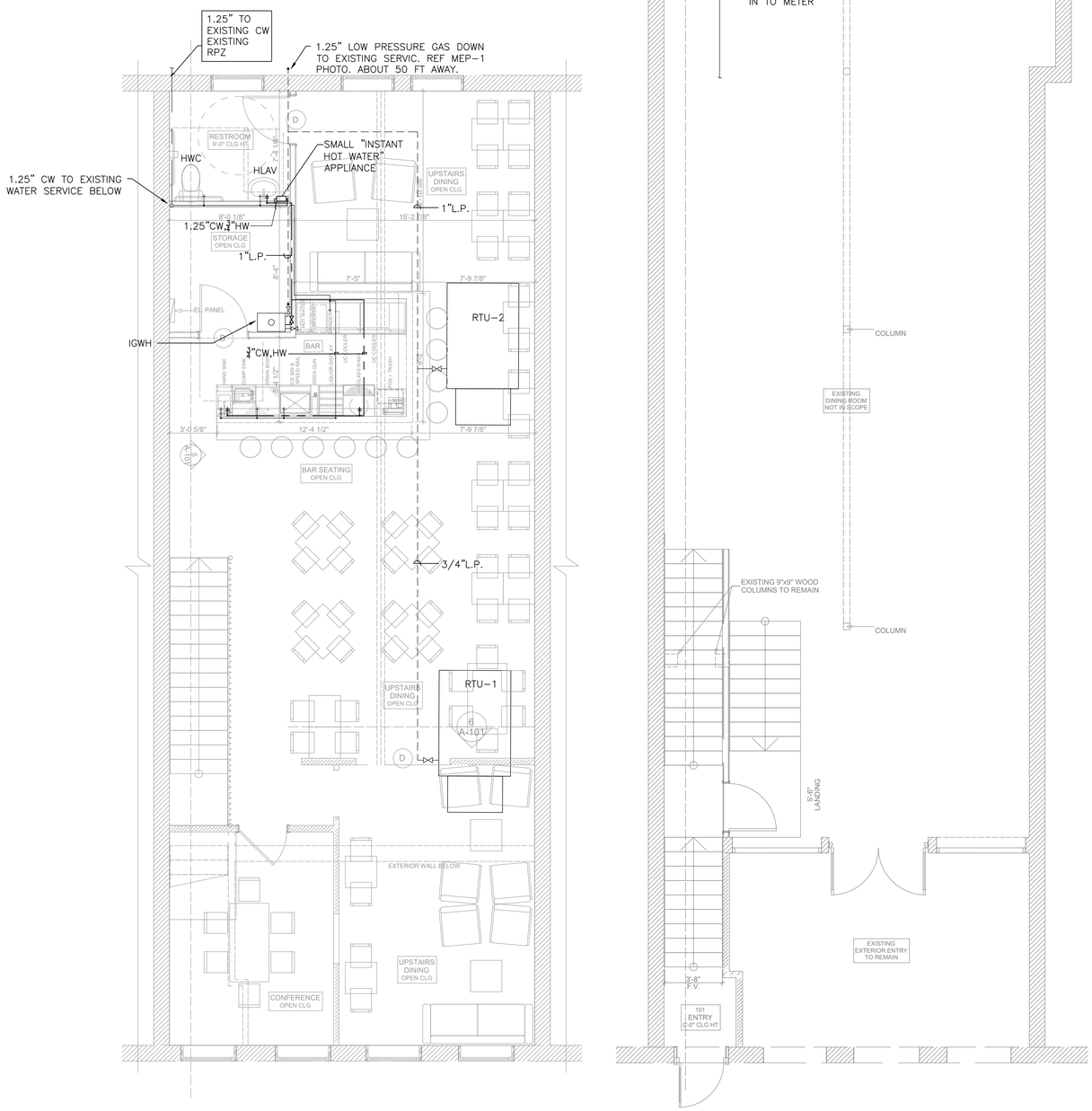

1 PLUMBING PLAN – WATER AND GAS
SCALE: 1/4" = 1'-0"

NOTES:
1. REFERENCE SPECIFICATIONS, SHEET MEP – 2 .
2. COORDINATE CONNECTIONS WITH EXISTING WASTE LINE. MAIN FLOOR IS BELOW EXISTING.
3. INSULATE CONDENSATE LINES WITH MINIMUM R–4 INSULATION .
4. PROVIDE RPZ BACK FLOW PREVENTORS FOR ALL HARD PIPED APPLIANCES AND EQUIPMENT PER CODE .
5. INSULATE ALL WATER LINES PER LATEST APPROVED EDITION OF PLUMBING CODE .
6. HEAT TRACE INSULATED HOT WATER PIPING PER CODE.
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10. ROUTE RTU INSULATED CONDENSATE TO MOP SINK WITH AIR GAP.
11. PLUMBING WORK FOR THIS PROJECT INCLUDES SOME GAS PIPING AND NEW FIXTURES.
12. FIELD VERIFY BEST TIE IN POINT FOR RR WASTE LINE.
13. PROVIDE FLOOR DRAIN LOCATIONS AS SHOWN AND PER 2021 IPC.
14. PROVIDE SEDIMENT TRAP INCLUDING BUCKET TYPE FLOOR DRAINS

FIXTURE ROUGH–IN SCHEDULE

Rough–in fixture piping connections in accordance with following table of minimum sizes for particular fixtures.

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Drinking Fountain or EWC	---	1/2 inch	1–1/4 inch	1–1/4 inch
Water Closet (Flush Valve)	---	1 inch	4 inch	2 inch
Water Closet (Tank Type)	---	1/2 inch	4 inch	2 inch
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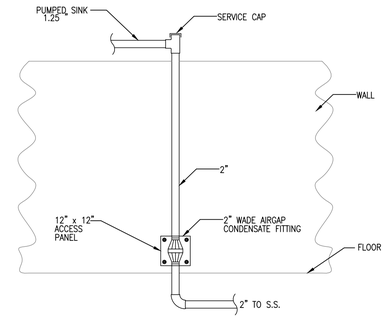
Urinal (Tank Type)	---	1/2 inch	2 inch	1–1/2 inch
Showers	1/2 inch	1/2 inch	Floor Drain 2"	See Plans



2 HUB DRAIN FITTING DETAIL
SCALE: N.T.S.

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REVISIONS

PLUMBING WASTE

ISSUE DATE:

Scale:

Drawn: JB

Job: 19-057-001

Sheet Number: P–2

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02.12.2025

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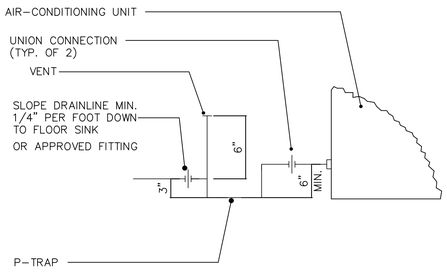

1 AC UNIT CONDENSATE DETAIL
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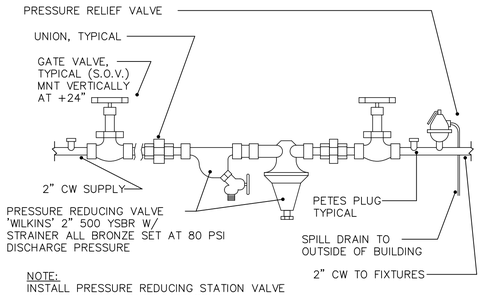

2 PRESSURE REDUCING VALVE
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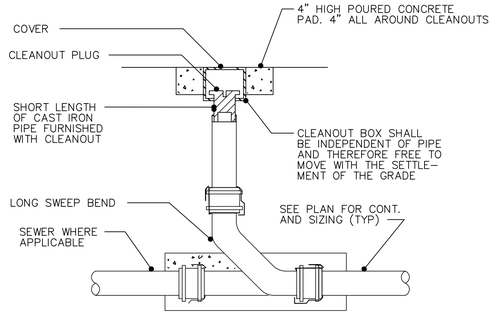
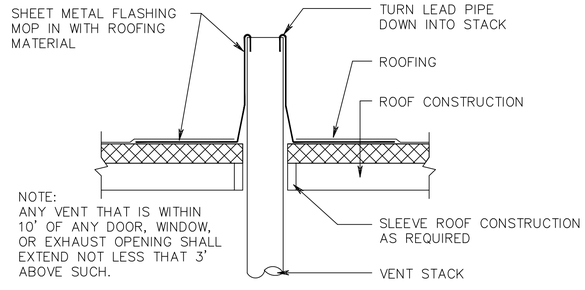
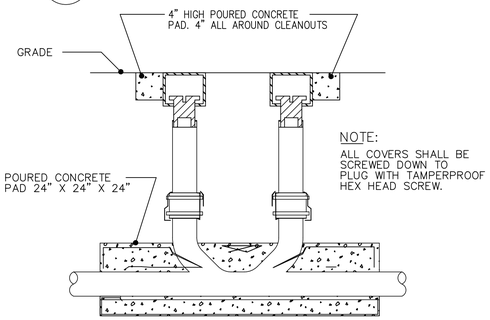


3 1-WAY CLEANOUT TO GRADE
SCALE: N.T.S.



4 VENT THRU ROOF DETAIL NTS
COORDINATE LOCATION OF ALL ROOF PENETRATIONS WITH ARCHITECT



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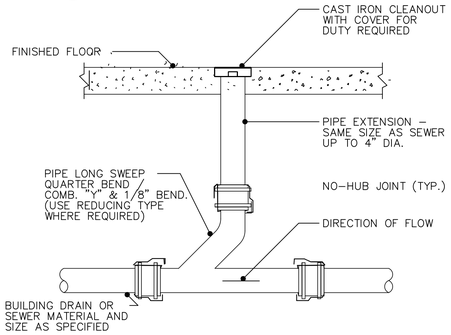
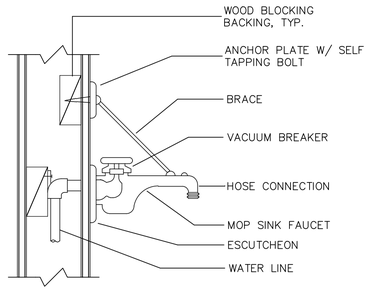
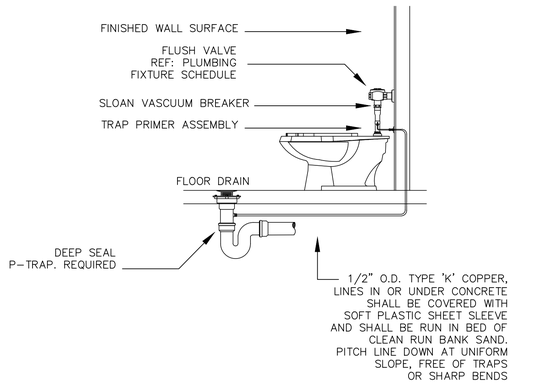


6 INTERIOR FLOOR CLEANOUT
SCALE: N.T.S.



7 BLOCKING DETAIL
SCALE: N.T.S.



8 P-TRAP AMD TOILET DETAIL
SCALE: N.T.S.

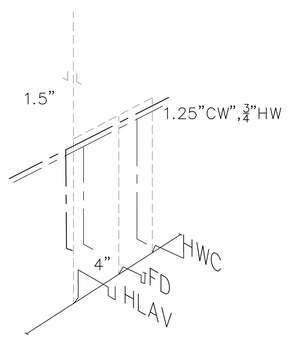
PLUMBING FIXTURE SCHEDULE

PLUMBER WORK SCOPE INCLUDED KITCHEN EQUIPMENT INSTALLATION
SEE ARCHITECTURAL ELEVATIONS FOR MOUNTING HEIGHTS

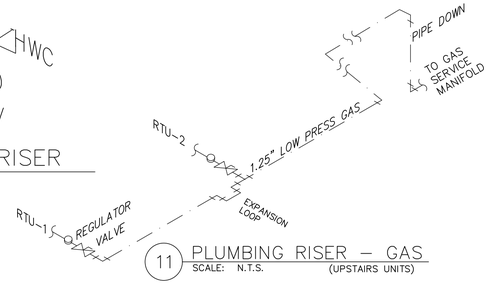
FIXTURE MARK	MANUFACTURER SERIES NUMBER	WATER CLOSET AND URINAL					ACCESSORIES AND FEATURES
		BOWL TYPE	OUTLET	FLUSH VALVE	SEAT	CARRIER	
WC	AMERICAN STANDARD CADET	WALL MOUNTED ELONGATED SIPHON-JET	BACK	SLOAN 111	BENEKE 523	WADE	FLUSH VALVE TOILET – FLOOR MOUJNTED
HWC	AMERICAN STANDARD ADA CADET	WALL MOUNTED ELONGATED SIPHON-JET	BACK	SLOAN 111	BENEKE 523	WADE	INSTALL PER A.D.A. REQUIREMENTS. FLUSH VALVE HEIGHT SHALL BE DECREASED AS REQUIRED TO AVOID HAND RAIL CONFLICT TO WIDE SIDE OF STALL
UR	AMERICAN STANDARD 6541.132	WALL-HUNG WASH OUT	BACK	SLOAN 186-1		JOSAM 17810	STD. URINAL
HUR	AM STD ALLBROOK 6540						INSTALL PER A.D.A. REQUIREMENTS. AND Texas Accessabilities Standard
FIXTURE MARK	MANUFACTURER SERIES NUMBER	LAVATORY/SINK					ACCESSORIES AND FEATURES
		BOWL TYPE	FAUCET	SUPPLY PIPE	TRAP		
LAV HLAV	AMERICAN STANDARD LUCERNE OR EQUAL	CHINA	INCLUDED	INCLUDED	INCLUDED	WADE	EQUIPPED AND INSTALLED FOR HANDICAPPED USE. FAUCET WITH LEVER TYPE HANDLE AND 0.5 GPM AERATOR, w/ PIPE INSULATION/PROTECTION
LAV	AMERICAN STANDARD LUNCERNE OR EQUAL	CHINA	INCLUDED	INCLUDED	INCLUDED	WADE	EQUIPPED AND INSTALLED FOR HANDICAPPED USE. FAUCET WITH LEVER TYPE HANDLE AND 0.5 GPM AERATOR.
MS	FIAT OR EQUAL MS2424	CAST RESIN	AMER. STD. 8340.242	INCLUDED	7798.176 W/STRAINER		FAUCET WITH 16" HIGH SIDE AND BACK SPLASH WITH LEVER TYPE HANDLE BACKFLOW/VACUUM BREAKER/HOSE CONNECTION
FIXTURE MARK	MANUFACTURER SERIES NUMBER	FLOOR DRAIN/STRAINER					ACCESSORIES AND FEATURES
		MATERIAL	TYPE	SIZE	FREE AREA	MATERIAL	
FD	JOSAM 30003-6A-50	CAST IRON	6A	6"ø	11 SQ. IN.	BUFF POLISHED BRONZE	TWO PIECE BODY, DOUBLE DRAINAGE FLANGE, WEEP HOLES WITH P-TRAP.
FIXTURE MARK	MANUFACTURER SERIES NUMBER	WATER HEATER					ACCESSORIES AND FEATURES
		GAL. CAPACITY	TYPE	# ELEMENTS	WATTS	VOLTS/ø	
IGWH-1	RINAII, NAVIAN ,RHEEM 199K	INSTANT	GAS			120V CTRL	T & P VALVE, 4" PAN, OV FLO PIPED TO OUTSIDE PIPED TO OUTSIDE
FIXTURE MARK	MANUFACTURER SERIES NUMBER	ELECT. WATER COOLER					ACCESSORIES AND FEATURES
		CAPACITY	VOLTS	HP	FINISH		
EWC HEWC ALTERNATE	OASIS PLF8WMQSL (SURFACE)	7.8 GPH	115	1/5	STANDARD		WALL MOUNTED BI-LEVEL ELECTRIC WATER COOLER. INSTALL PER A.D.A./ T.A.S. REQUIREMENTS. REFERENCE ARCHITECTURAL DETAILS AND PLANS
	ELKAY (TWINNED UNIT) LKTE-8 (FLUSH)	8 GPH	115	1/5	STAINLESS		
FIXTURE MARK	MANUFACTURER SERIES NUMBER	ROOF DRAINS					ACCESSORIES AND FEATURES
		BODY MATERIAL	SIZE	WEIGHT	DOME MATERIAL	DOME FREE AREA	
NOTE USED							

NOTES:

1. ALL FIXTURES SHALL BE ACCESSIBLE TO INDIVIDUALS WITH DISABILITIES IN ACCORDANCE WITH THE "AMERICANS WITH DISABILITIES ACT OF 1990". FIXTURES AND THEIR INSTALLATION SHALL ALSO COMPLY WITH AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) PUBLICATION A117.1 – "PROVIDING ACCESSIBILITY AND USABILITY FOR PHYSICALLY HANDICAPPED PEOPLE" AND/OR GOVERNING CODE. REF DIV 15 SPECS FOR ADDITIONAL REQUIREMENTS. COMPLY WITH TEXAS ACCESSABILITY STANDARDS.
2. ALL PLUMBING FIXTURES, EQUIPMENT, TRIM, AND FITTINGS SHALL COMPLY WITH LOCAL, STATE, AND FEDERAL REGULATIONS AND CODES, INCLUDING, BUT NOT LIMITED TO, WATER AND ENERGY CONSERVATION CODES. THE SCHEDULED AND/OR SPECIFIED PLUMBING FIXTURES AND EQUIPMENT REPRESENT THE MINIMUM CRITERIA AND SHALL BE THE BASIS FOR THE CONTRACTOR'S BASE BID. IF THE SCHEDULED OR SPECIFIED FIXTURES OR EQUIPMENT DO NOT COMPLY WITH GOVERNING CODES OR REGULATIONS IN ALL RESPECTS, THE CONTRACTOR SHALL PROVIDE AN ALTERNATE BID FOR COMPLYING FIXTURES, EQUIPMENT, TRIM, OR FITTINGS. THE ABSENCE OF AN ALTERNATE BID SHALL BE CONSTRUED TO MEAN THAT THE CONTRACTOR'S BID INCLUDES ALL COSTS NECESSARY TO MEET ALL REGULATIONS AND CODES.



10 TYPICAL RESTROOM RISER
SCALE: N.T.S.



11 PLUMBING RISER – GAS
SCALE: N.T.S. (UPSTAIRS UNITS)

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These plans are intended to provide the basic construction information necessary to substantially complete this structure. These construction documents must be verified and supplemented by the contractor prior to construction. Any discrepancies, errors, and/or omissions, if any, are to be brought to the attention of the Designer prior to any construction or purchases being made. It is recommended that the owner or builder obtain the services of a licensed professional to supervise the construction of this structure. Codes of any kind: NOTE: All Federal, state, and Local codes, ordinances, and restrictions take precedence over any part of these construction documents which may conflict with same, and must be complied with in every detail.
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DETAILS

REVISIONS

ISSUE DATE:

Scale:

Drawn: JB

Job: 19-057-001

Sheet Number: P-3

PERMIT, PRICING & CONSTRUCTION SET

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J25C013

STATE OF TEXAS BRYANT HAWKES 49717 REGISTERED PROFESSIONAL ENGINEER

02.12.2025

114 W. Oak
West Oak Coffee Bar
Downtown Reinvestment Grant

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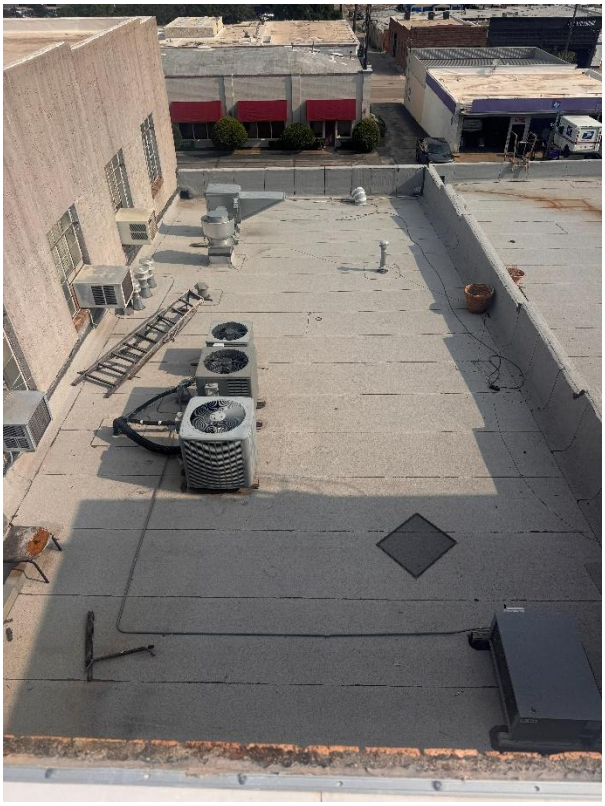
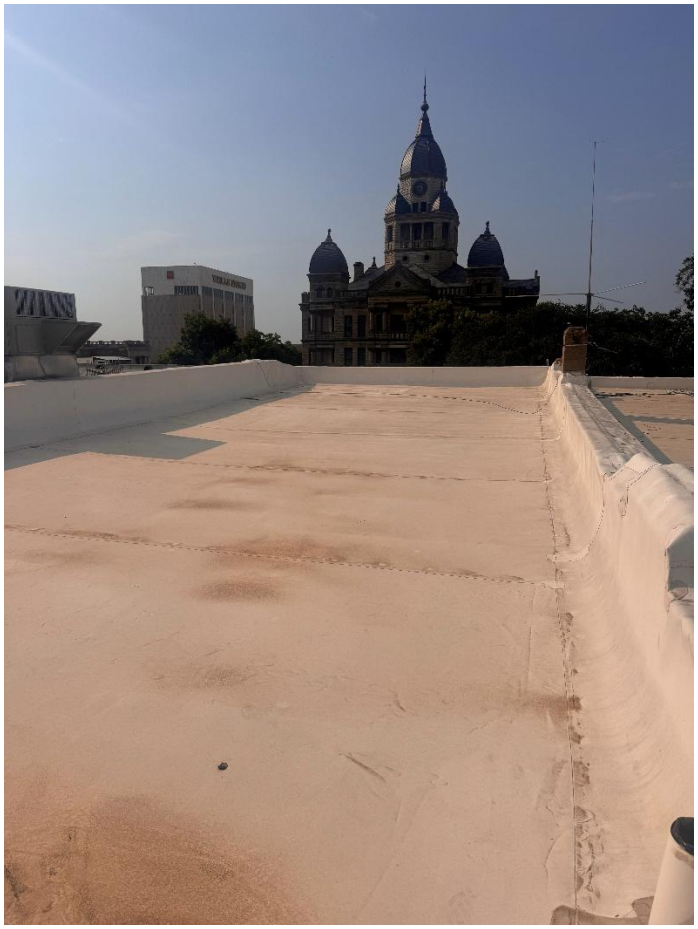
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