

**INFORMAL STAFF REPORT
TO MAYOR AND CITY COUNCIL**

SUBJECT:

The two-minute pitch from Councilmember McGee on November 19, 2024: The City of Denton has already set aggressive goals to fight climate change locally such as considering the materials used in the construction of our roadways, to increasing our tree canopy goals, funding our Greensense program, moving toward capturing the excess gasses at the landfill and encouraging more infill development aimed at decreasing VMTs (vehicle miles traveled). This pitch is to allow staff the time to publish an ISR about changes that can be made in our code to increase the amount of renewable energy available and to make it easier for residents to own and charge EV's at their chosen residence.

Consideration of updates which could be made to the City's adopted building codes requiring new single-family housing be built to be EV-Ready and Solar-Ready.

EXECUTIVE SUMMARY:

The code requirements for installation of solar-ready and Type 2 charger EV-ready construction are located in the appendix of the commercial and residential building codes. The current code requirements currently accommodate new residential construction as Type 1 EV-ready.

Electric Vehicle (EV) Charging-Ready:

Type 1 chargers are accommodated within the current residential building code. Each parking space in the garage is required to have an accessible GFCI protected 110v outlet. Most EV vehicles are sold with a Type 1 charging adapter.

To prepare a home for Type 2 EV chargers (or an EV-ready system), the new construction to install EV ready would have an approximate cost impact of about \$1500, paid for by the builder and passed along to the homeowner in the cost of the home.

In the last 6 years, the city has issued 49 residential EV charger (Type 2) permits, 21 of those permits were issued this year. During this same period, the City has issued 6,425 permits for single-family detached homes. (of the permitted SFR 0.76 % of the permitted and 0.16% of the total 38,000 single-family housing stock) If adopted, the EV-ready homes would be required to be fitted with enough space in the electric panel to accommodate the extra voltage needed for Type 2 EV charger.

As of October 2022, there were 600 registered electric cars in the city of Denton. As of December 3, 2024 the North Central Texas Council of Governments reported 1,195 registered EVs in the City of Denton out of 108,219 total registered vehicles (1.1% EV adoption rate).

Solar-Ready

To prepare a home for solar-ready in accordance with the code appendices, the home construction plans must show the solar-ready zone, indicate the roof loads and calculations, location of the solar-ready zone, the roof shall be oriented between 110 degrees and 270 degrees of true north or have low sloped roofs, shall reserve space in the electrical panel and provide a permanent certificate indicating the solar-ready zone and all other requirements of section Appendix NL (see attachments), posted near the panel, water heater or other. These specific requirements would not apply to all homes constructed in Denton due to the diverse designs of the homes being constructed and the various orientation of homes to the street.

Today, the average cost for a solar install is around \$18,000 according to the National Renewable Energy Laboratory (NREL). In 2024, the city issued 93 permits for new residential solar panels. Past years show

that solar installations peaked at 375 permits issued in 2022, and the city has issued between 80 and 250 permits per year since 2017. Solar panel installations currently account for less than 1% of the number of existing homes per year.

BACKGROUND:

October 18, 2022, ID 22-1282 City Council received a presentation by staff in response to CM Watts's request on June 7, 2022, to discuss incentives and or requirements for EV charging and infrastructure for single-family homes with garages and multifamily developments. Costs were discussed and it was indicated that it was minimal to make all new homes EV-Ready. Retrofit costs average of \$1,500 per Type 2 EV charger for each home. In other communities such as in Colorado, the focus has been on EV-ready space for new single-family homes and requires some businesses to offer EV charging availability. After some discussion, the incentive approach was preferred to remove the cost burden. It was suggested that if a multifamily complex hits a certain size, EV could be required to be part of the required submittal. October 24, 2023, ID 23-937 City Council received a presentation by staff and the Sustainability Solutions Group discussing climate goals. That presentation showed that increasing Denton's local renewable energy generation capacity to 192 MW by 2048 would result in 0.4% reduction in the community's greenhouse gas (GHG) emissions. Additionally, electrifying personal and commercial vehicles by having 60% of new registrations by 2030 and 100% new registrations by 2050 would result in 56.7% reduction in the community's GHG emissions. Council directed staff to revise the proposed Climate Action and Adaption Plan, to encourage decarbonization of the fleet and increase local, renewable energy generation capacity. August 6, 2024 City Council adopted the City of Denton's Climate Action Plan (Resolution 24-1420) formalizing both actions.

The Internal Revenue Service (IRS) has several tax credits and deductions available for individuals and businesses related to clean energy, EV, and EV charging infrastructure. On August 17, 2021, City Council via Ordinance 21-1689 established the Sustainability Framework Fund for sustainability initiatives. The Sustainability Framework Fund could incentivize both EV-Ready and Solar Roof-Ready. For FY 2024-25, purchasing Electric Vehicles is part of the Sustainability Framework Fund annual workplan.

CONCLUSION:**EV-Ready:**

The building code can be updated to require Type 2 EV charging and solar-ready. The appendices can be adopted and amendment of the requirements for permits to include the construction of EV-ready and solar-ready. One city that has done Type 2 EV-ready (minimally – add a 240v outlet in the garage) is San Antonio. They have not required the homes to be solar-ready.

Based on the low number of registered EV vehicles and even lower number of Type 2 EV charging permits requested, it appears that the need for EV-ready (Type 2) installed in every new home is not substantiated at this time. The approximate cost increase to make EV-ready (Type 2) in a new home is \$1,500.00 if a code mandate were enacted. Incentives are a better approach, since the city requires Type 1 EV charging abilities for new home construction and to keep housing affordable for our citizens.

The incentive approach is preferred to remove the cost burden. It could be suggested that if a multifamily complex hits a certain size, a Type 2 or larger EV system could be required to be part of the construction submittal.

Solar-Ready:

Based on the number of currently installed solar systems and that there have been no solar systems installed at the time of new construction, it appears that the need for solar-ready for every new home is not substantiated at this time. Additionally, it is important to note that not all homes are ideally oriented or ideally designed to install solar. The approximate cost increase to make solar-ready in a new home is \$3,000.00, this includes the need for a specific design and the additional construction costs, if a mandate were to be enacted. There could be more costs incurred to the developer or builders that are unknown by staff.

The incentive approach is preferred to remove the cost burden. It could be suggested that if a multifamily complex hits a certain size, solar-ready, or another renewable energy source could be required to be part of the construction submittal. Staff recommends utilizing the Health and Building Standards Commission to review a proposed code amendment before City Council consideration. .

ATTACHMENTS:

1. Attachment 1 Appendix CG 2024 IECC
2. Attachment 2 Appendix RE 2024 IECC
3. Attachment 3 Appendix CB 2024 IECC
4. Attachment 4 Appendix RB 2024 IECC
5. Attachment 5 Resources

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REQUESTOR: Councilmember McGee

STAFF TIME TO COMPLETE REPORT: 15 hours.

PARTICIPATING DEPARTMENTS: Development Services, Environmental Services.

Attachment 1**Commercial Electric Vehicle Charging Infrastructure 2024 International Energy Conservation Code****APPENDIX CG ELECTRIC VEHICLE CHARGING INFRASTRUCTURE**

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

User notes:

About this appendix: Appendix CG can be adopted by authorities having jurisdiction seeking electric vehicle charging infrastructure requirements.

SECTION CG101**ELECTRIC VEHICLE POWER TRANSFER****CG101.1 Definitions.**

AUTOMOBILE PARKING SPACE. A space within a building or private or public parking lot, exclusive of driveways, ramps, columns, office and work areas, for the parking of an automobile.

ELECTRIC VEHICLE (EV). An automotive-type vehicle for on-road use, such as passenger automobiles, buses, trucks, vans, neighborhood electric vehicles and electric motorcycles, primarily powered by an electric motor that draws current from a building electrical service, electric vehicle supply equipment (EVSE), a rechargeable storage battery, a fuel cell, a photovoltaic array or another source of electric current.

ELECTRIC VEHICLE CAPABLE SPACE (EV CAPABLE SPACE). A designated automobile parking space that is provided with electrical infrastructure such as, but not limited to, raceways, cables, electrical capacity, a panelboard or other electrical distribution equipment space necessary for the future installation of an EVSE

ELECTRIC VEHICLE READY SPACE (EV READY SPACE). An automobile parking space that is provided with a branch circuit and an outlet, junction box or receptacle that will support an installed EVSE

ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE). Equipment for plug-in power transfer, including ungrounded, grounded and equipment grounding conductors; electric vehicle connectors; attached plugs; any personal protection system; and all other fittings, devices, power outlets or apparatus installed specifically for the purpose of transferring energy between the premises wiring and the electric vehicle.

ELECTRIC VEHICLE SUPPLY EQUIPMENT INSTALLED SPACE (EVSE SPACE). An automobile parking space that is provided with a dedicated EVSE connection.

CG101.2 Electric vehicle power transfer infrastructure.

Parking facilities shall be provided with electric vehicle power transfer infrastructure in accordance with Sections CG101.2.1 through CG101.2.6.

CG101.2.1 Quantity.

The number of required electric vehicle (EV) spaces, *EV capable spaces* and *EV ready spaces* shall be determined in accordance with this section and Table CG101.2.1 based on the total number of *automobile parking spaces* and shall be rounded up to the nearest whole number. For R-2 buildings, the Table CG101.2.1 requirements shall be based on the total number of *dwelling units* or the total number of *automobile parking spaces*, whichever is less.

1. Where more than one parking facility is provided on a *building site*, the number of required *automobile parking spaces* required to have EV power transfer infrastructure shall be calculated separately for each parking facility.
2. Where one shared parking facility serves multiple building occupancies, the required number of spaces shall be determined proportionally based on the floor area of each building occupancy.

3. Installed electric vehicle supply equipment installed spaces (*EVSE spaces*) that exceed the minimum requirements of this section may be used to meet the minimum requirements for *EV ready spaces* and *EV capable spaces*.
4. Installed *EV ready spaces* that exceed the minimum requirements of this section may be used to meet the minimum requirements for *EV capable spaces*.
5. Where the number of *EV ready spaces* allocated for R-2 occupancies is equal to the number of *dwelling units* or to the number of *automobile parking spaces* allocated to R-2 occupancies, whichever is less, requirements for *EVSE spaces* for R-2 occupancies shall not apply.
6. Requirements for a Group S-2 parking garage shall be determined by the occupancies served by that parking garage. Where new automobile spaces do not serve specific occupancies, the values for Group S-2 parking garage in Table CG101.2.1 shall be used.

Exception: Parking facilities serving occupancies other than R2 with fewer than 10 *automobile parking spaces*.

**TABLE CG101.2.1
REQUIRED EV POWER TRANSFER INFRASTRUCTURE**

OCCUPANCY	EVSE SPACES	EV READY SPACES	EV CAPABLE SPACES
Group A	10%	0%	10%
Group B	15%	0%	30%
Group E	15%	0%	30%
Group F	2%	0%	5%
Group H	1%	0%	0%
Group I	15%	0%	30%
Group M	15%	0%	30%
Group R-1	20%	5%	75%
Group R-2	20%	5%	75%
Groups R-3 and R-4	2%	0%	5%
Group S exclusive of parking garages	1%	0%	0%
Group S-2 parking garages	15%	0%	30%

CG101.2.2 EV capable spaces.

Each *EV capable space* used to meet the requirements of Section CG101.2.1 shall comply with the following:

1. A continuous raceway or cable assembly shall be installed between an enclosure or outlet located within 3 feet (914 mm) of the *EV capable space* and electrical distribution equipment.
2. Installed raceway or cable assembly shall be sized and rated to supply a minimum circuit capacity in accordance with Section CG101.2.5.
3. The electrical distribution equipment to which the raceway or cable assembly connects shall have dedicated overcurrent protection device space and electrical capacity to supply a calculated load in accordance with Section CG101.2.5.
4. The enclosure or outlet and the electrical distribution equipment directory shall be marked: "For electric vehicle supply equipment (EVSE)."

CG101.2.3 EV ready spaces.

Each branch circuit serving *EV ready spaces* used to meet the requirements of Section CG101.2.1 shall comply with the following:

1. Terminate at an outlet or enclosure located within 3 feet (914 mm) of each *EV ready space* it serves.
2. Have a minimum system and circuit capacity in accordance with Section CG101.2.5.
3. The electrical distribution equipment directory shall designate the branch circuit as “For electric vehicle supply equipment (EVSE)” and the outlet or enclosure shall be marked “For electric vehicle supply equipment (EVSE).”

CG101.2.4 EVSE spaces.

An installed EVSE with multiple output connections shall be permitted to serve multiple *EVSE spaces*. Each EVSE installed to meet the requirements of Section CG101.2.1, serving either a single *EVSE space* or multiple *EVSE spaces*, shall comply with the following:

1. Have a minimum system and circuit capacity in accordance with Section CG101.2.5.
2. Have a nameplate rating not less than 6.2 kW.
3. Be located within 3 feet (914 mm) of each *EVSE space* it serves.
4. Be installed in accordance with Section CG101.2.6.

CG101.2.5 System and circuit capacity.

The system and circuit capacity shall comply with Sections CG101.2.5.1 and CG101.2.5.2.

CG101.2.5.1 System capacity.

The electrical distribution equipment supplying the branch circuit(s) serving each *EV capable space*, *EV ready space* and *EVSE space* shall comply with one of the following:

1. Have a calculated load of 7.2 kVA or the nameplate rating of the equipment, whichever is larger, for each *EV capable space*, *EV ready space* and *EVSE space*.
2. Meets the requirements of Section CG101.2.5.3.1.

CG101.2.5.2 Circuit capacity.

The branch circuit serving each *EV capable space*, *EV ready space* and *EVSE space* shall comply with one of the following:

1. Have a rated capacity not less than 50 amperes or the nameplate rating of the equipment, whichever is larger.
2. Meets the requirements of Section CG101.2.5.3.2.

CG101.2.5.3 System and circuit capacity management.

Where system and circuit capacity management is selected in Section CG101.2.5.1 or CG101.2.5.2, the installation shall comply with Sections CG101.2.5.3.1 and CG101.2.5.3.2.

CG101.2.5.3.1 System capacity management.

The maximum equipment load on the electrical distribution equipment supplying the branch circuits(s) serving *EV capable spaces*, *EV ready spaces* and *EVSE spaces* controlled by an energy management system shall be the maximum load permitted by the energy management system, but not less than 3.3 kVA per space.

CG101.2.5.3.2 Circuit capacity management.

Each branch circuit serving multiple *EVSE spaces*, *EV ready spaces* or *EV capable spaces* controlled by an energy management system shall comply with one of the following:

1. Have a minimum capacity of 25 amperes per space.
2. Have a minimum capacity of 20 amperes per space for R-2 occupancies where all *automobile parking spaces* are *EV ready spaces* or *EVSE spaces*.

CG101.2.6 EVSE installation.

EVSE shall be installed in accordance with NFPA 70 and shall be listed and labeled in accordance with UL 2202 or UL 2594. EVSE shall be accessible in accordance with Section 1107 of the International Building Code.

SECTION CG102 REFERENCED STANDARDS**CG102.1 General.**

See Table CG102.1 for standards that are referenced in various sections of this appendix. Standards are listed by the standard identification with the effective date, standard title, and the section or sections of this appendix that reference the standard.

TABLE CG102.1 REFERENCED STANDARDS

STANDARD ACRONYM	STANDARD NAME	SECTIONS HEREIN REFERENCED
UL 2202—2009	Electric Vehicle (EV) Charging System—with revisions through February 2018	<u>CG101.2.6</u>
UL 2594—2016	Standard for Electric Vehicle Supply Equipment	<u>CG101.2.6</u>

Attachment 2**Residential Electric Vehicle Charging Infrastructure 2024 International Energy Conservation Code****APPENDIX RE ELECTRIC VEHICLE CHARGING INFRASTRUCTURE**

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

About this appendix: *This appendix provides requirements for electric vehicle charging infrastructure for adopting jurisdictions.*

SECTION RE101 ELECTRIC VEHICLE POWER TRANSFER**RE101.1 Definitions.**

AUTOMOBILE PARKING SPACE. A space within a *building* or private or public parking lot, exclusive of driveways, ramps, columns, office and work areas, for the parking of an automobile.

ELECTRIC VEHICLE (EV). An automotive-type vehicle for on-road use, such as passenger automobiles, buses, trucks, vans, neighborhood electric vehicles and electric motorcycles, primarily powered by an electric motor that draws current from a building electrical service, *electric vehicle supply equipment* (EVSE), a rechargeable storage battery, a fuel cell, a photovoltaic array or another source of electric current.

ELECTRIC VEHICLE CAPABLE SPACE (EV CAPABLE SPACE). A designated *automobile parking space* that is provided with electrical infrastructure such as, but not limited to, raceways, cables, electrical capacity, a panelboard or other electrical distribution equipment space necessary for the future installation of an *EVSE*.

ELECTRIC VEHICLE READY SPACE (EV READY SPACE). An *automobile parking space* that is provided with a branch circuit and an outlet, junction box or receptacle that will support an installed *EVSE*.

ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE). Equipment for plug-in power transfer, including ungrounded, grounded and equipment grounding conductors; electric vehicle connectors; attached plugs; any personal protection system; and all other fittings, devices, power outlets or apparatus installed specifically for the purpose of transferring energy between the premises wiring and the *electric vehicle*.

ELECTRIC VEHICLE SUPPLY EQUIPMENT INSTALLED SPACE (EVSE SPACE). An *automobile parking space* that is provided with a dedicated *EVSE* connection.

RE101.2 Electric vehicle power transfer infrastructure.

New residential *automobile parking spaces* for residential *buildings* shall be provided with *electric vehicle power transfer infrastructure* in accordance with Sections RE101.2.1 through RE101.2.5.

RE101.2.1 Quantity.

New one- and two-family dwellings and townhouses with a designated attached or detached garage or other on-site private parking provided adjacent to the *dwelling units* shall be provided with one *EV capable, EV ready* or *EVSE* space per *dwelling unit*. R-2 occupancies or allocated parking for R-2 occupancies in mixed-use *buildings* shall be provided with an *EV capable space, EV ready space* or *EVSE* space for 40 percent of the *dwelling units or automobile parking spaces*, whichever is less.

Exceptions:

1. Where the local electric distribution entity certifies in writing that it is not able to provide 100 percent of the necessary distribution capacity within 2 years after the estimated certificate of occupancy date, the required *EV* charging infrastructure shall be reduced based on the available existing electric distribution capacity.
2. Where substantiation is *approved* meeting the requirements of Section RE101.2.5 will alter the local utility infrastructure design requirements on the utility side of the meter so as to increase the utility side cost to the builder or developer by more than \$450 per *dwelling unit*.

RE101.2.2 EV capable spaces.

Each *EV capable space* used to meet the requirements of Section RE101.2.1 shall comply with all of the following:

1. A continuous raceway or cable assembly shall be installed between a suitable panelboard or other on-site electrical distribution equipment and an enclosure or outlet located within 6 feet (1828 mm) of the *EV capable space*.
2. The installed raceway or cable assembly shall be sized and rated to supply a minimum circuit capacity in accordance with Section RE101.2.5.
3. The electrical distribution equipment to which the raceway or cable assembly connects shall have sufficient dedicated space and spare electrical capacity for a two-pole circuit breaker or set of fuses.
4. The electrical enclosure or outlet and the electrical distribution equipment directory shall be marked: "For future electric vehicle supply equipment (EVSE)."

RE101.2.3 EV ready spaces.

Each branch circuit serving *EV ready spaces* shall comply with all of the following:

1. Termination at an outlet or enclosure, located within 6 feet (1828 mm) of each *EV ready space* it serves and marked "For electric vehicle supply equipment (EVSE)."
2. Service by an electrical distribution system and circuit capacity in accordance with Section RE101.2.5.
3. Designation on the panelboard or other electrical distribution equipment directory as "For electric vehicle supply equipment (EVSE)."

RE101.2.4 EVSE spaces.

An installed *EVSE* with multiple output connections shall be permitted to serve multiple *EVSE spaces*.

Each *EVSE* serving either a single *EVSE space* or multiple *EVSE spaces* shall comply with the following:

1. Be served by an electrical distribution system in accordance with Section RE101.2.5.
2. Have a nameplate charging capacity of not less than 6.2 kVA (or 30A at 208/240V) per *EVSE space* served. Where an *EVSE* serves three or more *EVSE spaces* and is controlled by an energy management system in accordance with Section RE101.2.5, the nameplate charging capacity shall be not less than 2.1 kVA per *EVSE space* served.

3. Be located within 6 feet (1828 mm) of each *EVSE space* it serves.
4. Be installed in accordance with NFPA 70 and be *listed* and *labeled* in accordance with UL 2202 or UL 2594.

RE101.2.5 Electrical distribution system capacity.

The branch circuits and electrical distribution system serving each *EV capable space*, *EV ready space* and *EVSE space* used to comply with Section RE101.2.1 shall comply with one of the following:

1. Sized for a calculated *EV* charging load of not less than 6.2 kVA per *EVSE*, *EV ready* or *EV capable space*. Where a circuit is shared or managed, it shall be in accordance with NFPA 70.
2. The capacity of the electrical distribution system and each branch circuit serving multiple *EVSE spaces*, *EV ready spaces* or *EV capable spaces* designed to be controlled by an energy management system in accordance with NFPA 70 shall be sized for a calculated *EV* charging load of not less than 2.1 kVA per space. Where an energy management system is used to control *EV* charging loads for the purposes of this section, it shall not be configured to turn off electrical power to *EVSE* or *EV ready spaces* used to comply with Section RE101.2.1.

SECTION RE102 REFERENCED STANDARDS

RE102.1 General.

See Table RE102.1 for standards that are referenced in various sections of this appendix. Standards are listed by the standard identification with the effective date, standard title, and the section or sections of this appendix that reference the standard.

TABLE RE102.1

REFERENCED STANDARDS

STANDARD ACRONYM	STANDARD NAME	SECTIONS HEREIN REFERENCED
UL 2202—2009	Electric Vehicle (EV) Charging System Equipment—with revisions through February 2018	<u>RE101.2.4</u>
UL 2594—2016	Standard for Electric Vehicle Supply Equipment	<u>RE101.2.4</u>

Attachment 3**Commercial Solar-ready Zone 2024 International Energy Conservation Code****APPENDIX CB SOLAR-READY ZONE—COMMERCIAL**

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

About this appendix: Appendix CB is intended to encourage the installation of renewable energy systems by preparing buildings for the future installation of solar energy equipment, piping and wiring.

SECTION CB101 SCOPE**CB101.1 General.**

These provisions shall be applicable for new construction where solar-ready provisions are required.

SECTION CB102 GENERAL DEFINITION

SOLAR-READY ZONE. A section or sections of the roof or building overhang designated and reserved for the future installation of a solar photovoltaic or solar thermal system.

SECTION CB103 SOLAR-READY ZONE**CB103.1 General.**

A solar-ready zone shall be located on the roof of buildings that are five stories or less in height above grade plane, and are oriented between 110 degrees and 270 degrees of true north or have *low slope* roofs. Solar-ready zones shall comply with Sections CB103.2 through CB103.8.

Exceptions:

1. 1.A *building* with a permanently installed, on-site renewable energy system.
2. 2.A *building* with a solar-ready zone that is shaded for more than 70 percent of daylight hours annually.
3. 3.A *building* where the licensed design professional certifies that the incident solar radiation available to the *building* is not suitable for a solar-ready zone.
4. 4.A *building* where the licensed design professional certifies that the solar zone area required by Section CB103.3 cannot be met because of extensive rooftop equipment, skylights, *vegetative roof* areas or other obstructions.

CB103.2 Construction document requirements for a solar-ready zone.

Construction documents shall indicate the solar-ready zone.

CB103.3 Solar-ready zone area.

The total solar-ready zone area shall be not less than 40 percent of the roof area calculated as the horizontally projected gross roof area less the area covered by skylights, occupied roof decks, *vegetative roof* areas and mandatory access or set back areas as required by the International Fire Code. The solar-ready zone shall be a single area or smaller, separated sub-zone areas. Each sub-zone shall be not less than 5 feet (1524 mm) in width in the narrowest dimension.

CB103.4 Obstructions.

Solar-ready zones shall be free from obstructions, including pipes, vents, *ducts*, HVAC equipment, skylights and roof-mounted equipment.

CB103.5 Roof loads and documentation.

A collateral dead load of not less than 5 pounds per square foot (5 psf) (24.41 kg/m²) shall be included in the gravity and lateral design calculations for the solar-ready zone. The structural design loads for roof dead load and roof live load shall be indicated on the *construction documents*.

CB103.6 Interconnection pathway.

Construction documents shall indicate pathways for routing of conduit or piping from the solar-ready zone to the electrical service panel or service hot water system.

CB103.7 Electrical service reserved space.

The main electrical service panel shall have a reserved space to allow installation of a dual-pole circuit breaker for future solar electric and shall be labeled “For Future Solar Electric.” The reserved spaces shall be positioned at the end of the panel that is opposite from the panel supply conductor connection.

CB103.8 Construction documentation certificate.

A permanent certificate, indicating the solar-ready zone and other requirements of this section, shall be posted near the electrical distribution panel, *water heater* or other conspicuous location by the builder or *registered design professional*.

Attachment 4**Residential Solar-Ready Provisions 2024 International Energy Conservation Code****APPENDIX RB SOLAR-READY PROVISIONS—DETACHED ONE- AND TWO-FAMILY DWELLINGS AND TOWNHOUSES**

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

About this appendix: *Harnessing the heat or radiation from the sun's rays is a method to reduce the energy consumption of a building. Although Appendix RB does not require solar systems to be installed for a building, it does require the space(s) for installing such systems, providing pathways for connections and requiring adequate structural capacity of roof systems to support the systems.*

SECTION RB101 SCOPE**RB101.1 General.**

These provisions shall be applicable for new construction where solar-ready provisions are required.

SECTION RB102 GENERAL DEFINITION

SOLAR-READY ZONE. A section or sections of the roof or *building* overhang designated and reserved for the future installation of a solar photovoltaic or solar thermal system.

SECTION RB103 SOLAR-READY ZONE**RB103.1 General.**

New detached one- and two-family dwellings, and townhouses with not less than 600 square feet (55.74 m²) of roof area oriented between 110 degrees and 270 degrees of true north shall comply with Sections RB103.2 through RB103.8.

Exceptions:

1. New residential *buildings* with a permanently installed *on-site renewable energy* system.
2. A *building* where all areas of the roof that would otherwise meet the requirements of Section RB103 are in full or partial shade for more than 70 percent of daylight hours annually.

RB103.2 Construction document requirements for solar-ready zone.

Construction documents shall indicate the *solar-ready zone*.

RB103.3 Solar-ready zone area.

The total *solar-ready zone* area shall be not less than 300 square feet (27.87 m²) exclusive of mandatory access or setback areas as required by the International Fire Code. New townhouses three stories or less in height above *grade plane* and with a total floor area less than or equal to 2,000 square feet (185.8 m²) per dwelling shall have a *solar-ready zone* area of not less than 150 square feet (13.94 m²). The *solar-ready zone* shall be composed of areas not less than 5 feet (1524 mm) in width and not less than 80 square feet (7.44 m²) exclusive of access or setback areas as required by the International Fire Code.

RB103.4 Obstructions.

Solar-ready zones shall be free from obstructions, including but not limited to vents, chimneys, and roof-mounted equipment.

RB103.5 Shading.

The *solar-ready zone* shall be set back from any existing or new permanently affixed object on the *building* or site that is located south, east or west of the solar zone a distance not less than two times the object's height above the nearest point on the roof surface. Such objects include, but are not limited

to, taller portions of the *building* itself, parapets, chimneys, antennas, signage, rooftop equipment, trees and roof plantings.

RB103.6 Capped roof penetration sleeve.

A capped roof penetration sleeve shall be provided adjacent to a *solar-ready zone* located on a roof slope of not greater than 1 unit vertical in 12 units horizontal (8-percent slope). The capped roof penetration sleeve shall be sized to accommodate the future photovoltaic system conduit, but shall have an inside diameter of not less than 1¹/₄ inches (32 mm).

RB103.7 Roof load documentation.

The structural design loads for roof dead load and roof live load shall be clearly indicated on the *construction documents*.

RB103.8 Interconnection pathway.

Construction documents shall indicate pathways for routing of conduit or plumbing from the *solar-ready zone* to the electrical service panel or service hot water system.

RB103.9 Electrical service reserved space.

The main electrical service panel shall have a reserved space to allow installation of a dual pole circuit breaker for future solar electric installation and shall be labeled “For Future Solar Electric.” The reserved space shall be positioned at the opposite (load) end from the input feeder location or main circuit location.

RB103.10 Construction documentation certificate.

A permanent certificate, indicating the *solar-ready zone* and other requirements of this section, shall be posted near the electrical distribution panel, water heater or other conspicuous location by the builder or registered design professional.

Attachment 5

Resources:

U.S. Department of Energy (Efficiency and Renewable Energy - EERE)

National Renewable Energy Laboratory (NREL)

North Central Texas Council of Governments (NCTCOG)

Internal Revenue Service (IRS)

International Code Council (ICC)

City Council Archives

Other staff utilized:

Michael Gange, Director of Environmental Services and Sustainability

Scott McDonald, Director of Development Services/Building Official

Thomas Rotter, Journeyman Electrician, Building Inspector III