City of Louisville
COLORADO • SINCE 1878

# CITY COUNCIL COMMUNICATION
## AGENDA ITEM 8D

**SUBJECT:** **ORDINANCE NO. 1877, SERIES 2024 – AN ORDINANCE AMENDING TITLE 17 OF THE LOUISVILLE MUNICIPAL CODE CONCERNING ELECTRIC VEHICLE CHARGING INFRASTRUCTURE – 1st READING – SET PUBLIC HEARING 8/6/24**

**DATE:** **JULY 9, 2023**

**PRESENTED BY:** **ROB ZUCCARO, AICP, COMMUNITY DEVELOPMENT DIRECTOR**

**SUMMARY:**
Staff is presenting a proposed ordinance that updates the City's standards for Electric Vehicle Charging Infrastructure that must be installed with new development. The update is intended to align with the standards set forth in the Colorado Model Electric and Solar Ready Code, published by the Colorado Energy Office.

**BACKGROUND:**
The City adopted Ordinance No. 1816, Series 2021 on October 19, 2021, which established Electric Vehicle (EV) Charging Infrastructure requirements for all new residential and commercial developments in the City and additions that add 25% or more new commercial building area or 50% or more new residential building area to an existing development. The standards established categories for *EV Installed, Capable* and *Ready* parking spaces. An *EV Installed* parking space is a fully functional charging station. An *EV Ready* parking space is wired for a charging station but does not have the charger installed. An *EV Capable* parking space has a conduit for a future wiring and space reserved in the electrical service panel to install future wiring and a charger. The City based the number of spaces required on a review of similar ordinances from other jurisdictions and anticipated demand by use. Table 1 below summarizes the currently adopted number of spaces required by use.

In 2021 and 2022, the City also adopted a series of building code amendments to improve energy efficiency in new development and redevelopments. This included adoption of the 2021 International Energy Conservation Code, with amendments, requirements for all new commercial development to incorporate all-electric water and space heating systems as a way to limit the use of fossil fuels, and a requirement for certain commercial and multi-family developments to meet minimum *Energy Use Intensity* (EUI) ratings.

*Table 1: EV Charging Standards Established by Ordinance No. 1816, Series 2021*

| | EV Installed | EV- Ready | EV Capable |
|---|---|---|---|
| **Residential Uses** | | | |
| Single-Family unit | | 1 space | 1 space |
| Multi-Family unit, with dedicated parking spaces or garages | | 1 space | 1 space |
| **Tier 1** | | | |
| Multi-Family, without dedicated parking spaces or garages | 10% of spaces | 10% of spaces | 50% of spaces |
| Hotel, Motel, Extended Stay Lodging Facility | | | |
| **Tier 2 – Employment oriented uses** | 7% of spaces | 10% of spaces | 15% of spaces |
| Business and Professional Offices | | | |
| General research facilities, light industrial facilities including manufacturing, assembly, warehouse and fabrication | | | |
| Hospital | | | |
| **Tier 3 – Service and Sales oriented uses** | 5% of spaces | 10% of spaces | 10% of spaces |
| Private and public recreational and social facilities, membership clubs, lodges, and fraternal organizations | | | |
| Religious institution | | | |
| Commercial amusement, indoor and outdoor | | | |
| Schools, including public, private, vocational or business | | | |
| Restaurant | | | |
| Retail | | | |
| Personal service | | | |
| Medical and dental clinics | | | |

Following the adoption of each of these ordinances, the City Council asked City staff to conduct additional outreach to businesses, commercial property owners and developers to address concerns over feasibility of implementing certain parts of these new ordinances. The City held a public open house in August of 2023 to review the codes and gather input. Included in the input from this open house was that the City consider aligning its EV charging infrastructure standards with the Colorado Model Electric and Solar Ready Code, which the Colorado Energy Office adopted June 1, 2023 (see Attachment 2). This new model code has less stringent standards than what the City has adopted.

**PROPOSAL:**
The proposed ordinance would combine use types into three categories: commercial, multifamily residential (commercial R-2 occupancies), and other residential uses. A new category of *EV Capable Light* parking spaces is added. This category only requires a conduit from the electrical panel to the parking space for future upgrades, but does not require electrical panel capacity for the circuit. The number of required *EV Installed, Ready* and *Capable* parking spaces would all be reduced under the proposal from the current ordinance for commercial and multifamily development. The number of required spaces for other residential development would remain the same as the current ordinance. Table 2 below provides a summary of the proposed number of EV charging spaces.

*Table 2: Proposed Revised EV Charging Standards*

| Building Type | EVSE Installed Space | EV Ready Space | EV Capable Space | EV Capable Light Space |
|---|---|---|---|---|
| **Commercial Buildings: Non R-2 Occupancies** | | | | |
| With 10 or less parking spaces | 0 | 2 spaces | 0 | 0 |
| With greater than parking spaces | 2% of spaces | 8% of spaces | 10% of spaces | 10% of spaces |
| **Commercial Buildings: R-2 Occupancies** | | | | |
| With 10 or less parking spaces | 1 space | 1 space | 1 space | 1 space |
| With greater than 10 parking spaces | 5% of spaces | 15% of spaces | 10% of spaces | 30% of spaces |
| **Residential Buildings** | | | | |
| Per Dwelling | 0 | 1 space | 1 space | 0 |

The proposal also adds definitions to the zoning code (LMC Title 17) that currently exist in the building code (LMC Title 15) for ease of reference. A definition for *EV Capable Light* space would also be added to the code.

**ANALYSIS:**
In a review of other local codes, the City's existing EV Charging Infrastructure code is more stringent than some and less stringent than others. For example, Boulder County's EV charging code requires a lower percent of EV Installed spaces for commercial development and does not require for EV Capable or Ready spaces (see Attachment 3). Lafayette's code does require EV Capable and Ready spaces in addition to Installed Spaces, but with some categories at a higher percentage than the City's existing code (see Attachment 4). Aligning with the Colorado Model Electric and Solar Ready Code is a way to provide more consistency and predictability for property developers, while still meeting the City's goals to promote EV infrastructure.

**FISCAL IMPACT:**
No fiscal impact is anticipated from the changes to the code.

**PLANNING COMMISSION RECOMMENDATION:**
The Planning Commission reviewed the draft ordinance at their February 8, 2024 meeting and voted unanimously to recommend approval with the following conditions:

- Provide language to ensure a minimum "Level 2" EV charging station standards for installed spaces.
- Change R-2 multi-family residential occupancy with 10 or fewer parking spaces to require at least one EVSE Installed Space.
- Add language so that if EVSE Installed Spaces are provided above the minimum number that a credit can be provided to the required number of EV Capable, EV Ready, or EV Ready Light Spaces.
- Require labeling in electrical panels for the spaces reserved for breakers to support future EV Capable Spaces.

All Commission conditions were incorporated into the 1st reading draft for City Council.

The recording of the meeting is at the following link (6:30 – 1:14:30).
https://www.youtube.com/live/YCc4rVSudEc?si=hzQH-bhurnTipPHf

Minutes from the meeting will be available for the public hearing and second reading of the proposed ordinance.

**SUSTAINABILITY ADVISORY BOARD:**
The Sustainability Advisory Board has submitted a letter with comments on the proposed code amendment. The letter specifically references endorsement of the Planning Commission's recommendations.

**STAFF RECOMMENDATION:**
Staff recommends approval of Ordinance No. 1877, Series 2024 on first reading and setting the public hearing for August 6, 2024

**ATTACHMENTS:**

1. Ordinance No. 1877, Series 2024
2. Colorado Model Electric and Solar Ready Code
3. Boulder County Building Code Section K111.4, and R329
4. Lafayette Building Code Sections CD103, RD103, RD104, and RD105
5. Planning Commission Resolution 01, Series 2024
6. Louisville Sustainability Advisory Board Memo

**STRATEGIC PLAN IMPACT:**

| | | | |
|---|---|---|---|
| ☐ | **Financial Stewardship & Asset Management** | ☐ | **Reliable Core Services** |
| ☒ | **Vibrant Economic Climate** | ☐ | **Quality Programs & Amenities** |
| ☒ | **Engaged Community** | ☐ | **Healthy Workforce** |
| ☐ | **Supportive Technology** | ☐ | **Collaborative Regional Partner** |

**ORDINANCE NO. 1877**
**SERIES 2024**

**AN ORDINANCE AMENDING TITLE 17 OF THE LOUISVILLE MUNICIPAL CODE CONCERNING ELECTRIC VEHICLE CHARGING INFRASTRUCTURE**

**WHEREAS,** the City of Louisville remains committed to its adopted goals to reduce energy consumption, increase clean energy sources, and support the transition to a low-carbon community as outlined in the Sustainability Action Plan and Resolution 25, Series 2019, "A Resolution Setting Clean Energy and Carbon Reduction Goals"; and

**WHEREAS**, the City Council desires to add requirements for solar readiness, electric vehicle charging infrastructure, and building electrification to build a more resilient building stock and support future building and transportation electrification efforts pursued by residents and businesses; and

**WHEREAS,** by Ordinance No. 1816 adopted on October 19, 2021, the City Council amended the Zoning Code to require new construction include electric vehicle charging infrastructure; and

**WHEREAS,** the City Council desires to amend the City's electric vehicle charging standards to better align with the Colorado Model Electric Ready and Solar Ready Code, published June 1, 2023 by the Colorado Energy Office; and

**WHEREAS,** the Planning Commission, after property notice required by law, held a public hearing on this ordinance on February 8, 2024 and provided a recommendation to the City Council on its adoption; and

**WHEREAS,** the City Council, after proper notice as required by law, has held a public hearing on this ordinance providing for the adoption of said code.

**NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF LOUISVILLE, COLORADO:**

**Section 1.** Louisville Municipal Code Section 17.20.170. – Electric Vehicle Charging Infrastructure, is hereby amended as follows (words added are underlined; words deleted are ~~stricken through~~):

**Sec. 17.20.170. – Electric Vehicle Charging Infrastructure.**

A. Purpose and Intent. The purpose and intent of this section is to facilitate and encourage the use of electric vehicles, to expedite the establishment of convenient and cost-effective electric vehicle infrastructure, and establish the minimum requirements for such infrastructure to serve both short and long-term parking needs.

B. Definitions. The following definitions shall apply to this Section:

*Commercial Buildings,* for this section, means commercial buildings and R-Occupancies that are covered by the International Building Code.

*Electric Vehicle* (*EV*) means a vehicle registered for on-road use, primarily powered by an electric motor that draws current from a rechargeable storage source that is charged by being plugged into an electrical current source.

*Electric Vehicle Supply Equipment (EVSE)* means the electrical conductors and associated equipment external to the electric vehicle that provide a connection between the premises wiring and the electric vehicle to provide electric vehicle charging.

*Electric Vehicle (EV) Capable Space* means a designated parking space that is provided with conduit sized and rated for a minimum 40-amp, 208/240-Volt dedicated branch circuit and shall be no less than 1" in size. Conduit must be continuous from the future or existing electrical panelboard or switchboard location(s) and end at a junction box or receptacle located within close proximity of the parking space. The electrical panel serving the parking space shall have sufficient capacity and physical space for a dual-pole, 40-amp breaker and shall be labeled “For Future Electric Vehicle Supply.” The conduit shall be sealed at the junction or outlet box that is capped off, with the conduit sealed and the cap labeled as "For future electric vehicle charging."

*Electric Vehicle (EV) Capable Light Space* means a designated parking space that is provided with conduit sized and rated for a minimum 40-amp, 208/240-Volt dedicated branch circuit and shall be no less than 1" in size and has sufficient physical space adjacent to the existing electrical equipment for future electric upgrades.

*Electric Vehicle (EV) Ready Space* means a designated parking space that is provided with a dedicated branch circuit with wiring capable of supporting a minimum 40-ampere, 208/240-Volt circuit that terminates at a receptacle, plug, junction box, or an installed electric vehicle supply equipment within close proximity of the parking space. There shall be adequate reserved space in an electrical panelboard or switchboard to meet the electric vehicle requirements.

*Electric Vehicle Supply Equipment (EVSE) Installed Space* means a designated parking space with dedicated electric vehicle supply equipment capable of supplying a minimum 40-amp, dedicated circuit rated at 208/240 Volt from a building electrical panelboard.

*Electric vehicle charging stations (EVCS)* means a public or private parking space that is served by battery charging station equipment that has

as its primary purpose the transfer of electric energy (by conductive or inductive means) to a battery or other energy storage device in an electric vehicle.

*Electric vehicle charging station – private restricted use* means an electric vehicle charging station that is:

1. Privately owned and restricted access (e.g., single-family dwelling unit, executive parking, designated employee parking, assigned parking at multi-family residential building); or

2. Publicly owned and restricted (e.g., fleet parking with no access to the general public).

*Electric vehicle charging station – public use* means an electric vehicle charging station that is:

1. Publicly owned and publicly available (e.g., Park-n-ride, public library parking lot, Recreation and Senior Center lot, etc); or

2. Privately owned and available to visitors of the use (e.g., shopping center, hotel, office, etc.)

*Electric vehicle parking space* means any marked parking space that identifies the use to be exclusively for the parking of an electric vehicle.

*Residential Buildings,* for this section, means dwellings that are covered by the International Residential Code

C. Number of required electric vehicle charging stations. The following table sets forth the number of required charging stations for all new development or redevelopments as required in Chapter 15.18 of the Louisville Municipal Code. ~~This list is not intended to be exhaustive of each use category, however is intended to establish general categories of use tiers. The Director of Planning and Building Safety shall determine the appropriate tier if the use is not identified in the table below.~~ For each EVSE Installed Space beyond the minimum number of required spaces, a credit may be given for a required EV Ready, EV Capable, or EV Capable Light Space.

1. Requirements will be rounded up to the nearest whole number.

2. Minimum electrical and hardware requirements for EVSE Installed, EV Ready, and EV Capable are set forth in Chapter 15.18 of the Louisville Municipal Code.

3. Minimum Charging Rate. Each installed EVSE shall comply with one of the following:

a. Be capable of charging at a minimum rate of 6.2 kVA (or 30A at 208/240V).

b. When serving multiple EVSE installed spaces and controlled by an energy management system providing load management, be capable of simultaneously sharing each EVSE installed space at a minimum charging rate of no less than 3.3 kVA.

| | ~~EV Installed~~ | ~~EV- Ready~~ | ~~EV Capable~~ |
|---|---|---|---|
| ~~**Residential Uses**~~ | | | |
| ~~Single-Family unit~~ | | ~~1 space~~ | ~~1 space~~ |
| ~~Multi-Family unit, with dedicated parking spaces or garages~~ | | ~~1 space~~ | ~~1 space~~ |
| ~~**Tier 1**~~ | | | |
| ~~Multi-Family, without dedicated parking spaces or garages~~ | ~~10% of spaces~~ | ~~10% of spaces~~ | ~~50% of spaces~~ |
| ~~Hotel, Motel, Extended Stay Lodging Facility~~ | | | |
| ~~**Tier 2 – Employment oriented uses**~~ | ~~7% of spaces~~ | ~~10% of spaces~~ | ~~15% of spaces~~ |
| ~~Business and Professional Offices~~ | | | |
| ~~General research facilities, light industrial facilities including manufacturing, assembly, warehouse and fabrication~~ | | | |
| ~~Hospital~~ | | | |
| ~~**Tier 3 – Service and Sales oriented uses**~~ | ~~5% of spaces~~ | ~~10% of spaces~~ | ~~10% of spaces~~ |
| ~~Private and public recreational and social facilities, membership clubs, lodges, and fraternal organizations~~ | | | |
| ~~Religious institution~~ | | | |
| ~~Commercial amusement, indoor and outdoor~~ | | | |
| ~~Schools, including public, private, vocational or business~~ | | | |

| | | | |
|---|---|---|---|
| ~~Restaurant~~ | | | |
| ~~Retail~~ | | | |
| ~~Personal service~~ | | | |
| ~~Medical and dental clinics~~ | | | |

| **Building Type** | **EVSE Installed Space** | **EV Ready Space** | **EV Capable Space** | **EV Capable Light Space** |
|---|---|---|---|---|
| **Commercial Buildings: Non R-2 Occupancies** | | | | |
| With 10 or less parking spaces | 0 | 2 spaces | 0 | 0 |
| With greater than parking spaces | 2% of spaces | 8% of spaces | 10% of spaces | 10% of spaces |
| **Commercial Buildings: R-2 Occupancies** | | | | |
| With 10 or less parking spaces | 1 space | 1 space | 1 space | 1 space |
| With greater than 10 parking spaces | 5% of spaces | 15% of spaces | 10% of spaces | 30% of spaces |
| **Residential Buildings** | | | | |
| Per Dwelling | 0 | 1 space | 1 space | 0 |

D. Permitted locations.

1. EVCS are permitted in every zoning district when accessory to a principal permitted use. Such stations located at single-family and designated multi-family units shall be private restricted use only.

2. If the primary use of the parcel is the retail electric charging of vehicles, then the use shall be considered an automotive fueling station for zoning purposes. Installation shall be located in zone districts which permit this use.

E. General requirements.

1. Accessible spaces. A charging station will be considered accessible if it is located adjacent to, and can serve, an accessible parking space as defined and required by the ADA. It is not necessary to designate the EVSE exclusively for the use of vehicles parked in the accessible space.

2. EVCS – public use shall be subject to the following requirements.

a. The EVCSs shall be located in a manner that will be easily seen by the public for informational and security purposes.

b. The EVCSs shall be located in desirable and convenient parking locations will serve as an incentive for the use of electric vehicles.

c. The EVCSs must be operational during the normal business hours of the use(s) that it serves.

d. The EVSE shall be maintained in all respects, including the functioning of equipment. A phone number or other contact information shall be provided on the equipment for reporting problems with the equipment or access to it.

e. The property owner may collect a service fee for the use of EVSE.

**Section 2.** If any article, section, paragraph, sentence, clause, or phrase of this ordinance is held to be unconstitutional or invalid for any reason, such decision shall not affect the validity or constitutionality of the remaining portions of this ordinance. The City Council hereby declares that it would have passed this ordinance and each part or parts hereof irrespective of the fact that any one part or parts be declared unconstitutional or invalid.

**Section 3.** The repeal or modification of any provision of any prior ordinance by this ordinance shall not release, extinguish, alter, modify, or change in whole or in part any penalty, forfeiture or liability, either civil or criminal, which shall have been incurred under such provision, and each provision shall be treated and held as still remaining in force for the purpose of sustaining any judgment, decree, or order which can or may be rendered, entered, or made in such actions, suits, proceedings, or prosecutions.

**Section 4.** All other ordinances or portions thereof inconsistent or conflicting with this ordinance or any portion hereof are hereby repealed to the extent of such inconsistency or conflict.

**INTRODUCED, READ, PASSED ON FIRST READING, AND ORDERED PUBLISHED** this _____ day of _____, 2024.

_____
Christopher M. Leh, Mayor

ATTEST:

_____
Meredyth Muth, City Clerk

APPROVED AS TO FORM:

_____
Kelly PC, City Attorney

**PASSED AND ADOPTED ON SECOND AND FINAL READING,** this _____ day of _____, 2024.

_____
Christopher M. Leh, Mayor

ATTEST:

_____
Meredyth Muth, City Clerk

COLORADO
Energy Office

# Colorado Model Electric Ready and Solar Ready Code

Published: June 1, 2023

COLORADO
Department of Local Affairs

# Chapter 1 Scope and Administration

## SECTION 101 SCOPE AND GENERAL REQUIREMENTS.

**101.1 Title.** This code shall be known as the **Electric Ready and Solar Ready Code** of [NAME OF JURISDICTION], and shall be cited as such. It is referred to herein as "this code".

**101.2 Scope.** This code applies to all buildings and dwelling units, and the buildings' sites and associated systems and equipment.

**101.3 Intent.** This code shall regulate the design and construction of buildings to prepare new buildings for solar photovoltaic or solar thermal, electric vehicle charging infrastructure, and electrification of building systems. This code is intended to provide flexibility and balance upfront construction costs with the future cost to retrofit buildings to accommodate these systems. This code is not intended to abridge safety, health or environmental requirements contained in other applicable codes or ordinances.

**101.4. Applicability.** Where, in any specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

> **101.4.1 Residential Buildings.** *Residential buildings* must comply with the Residential Chapters of this code.
>
> **101.4.2 Commercial Buildings.** *Commercial buildings* must comply with the Commercial Chapters of this code.

## SECTION 102 WAIVER AND VARIANCE.

**102.1 Scope.** The following waivers shall be permitted to be requested if buildings meet the following requirements.

> **102.1.1 Commercial Buildings Greater than 10,000 sq. ft.** *Commercial buildings* that have a gross floor area greater than 10,000 sq. ft. shall be eligible to request

a partial waiver to the requirements of this code if they meet the requirements of Section **102.2**.

**102.1.2 Buildings Impacted by a Natural Disaster.** [NAME OF JURISDICTION] is permitted to authorize, upon appeal in specific cases, a waiver from the requirements of this code where, owing to a declared natural disaster that has destroyed buildings or resulted in other exceptional and extraordinary circumstances as determined by [NAME OF JURISDICTION], and [NAME OF JURISDICTION] determines enforcement of the provisions of this code will result in unnecessary hardship.

**102.2 Substantial Cost Differential Waiver.** [NAME OF JURISDICTION] shall be permitted to authorize, upon appeal, a waiver from the requirements of this code for an applicant that asserts that compliance with this code will result in a substantial cost differential. [NAME OF JURISDICTION], when authorizing such a waiver, shall be permitted to waive certain requirements of this code only until the cost differential for compliance with the remaining requirements reaches one percent or less. The burden of proof is upon the applicant to provide substantiation of a cost differential, such as quotes or other licensed design professional analyses as *approved* by [NAME OF JURISDICTION].

**102.2.1 Substantial Cost Differential.** For the purposes of Section **102.2**, "substantial cost differential" means costs incurred as a result of compliance with the requirements of this code would exceed one percent of total mechanical, electrical, and plumbing construction costs inclusive of materials and labor.

## SECTION 103 CONSTRUCTION DOCUMENTS.

**103.1 General.** Construction documents and other supporting data shall be submitted in one or more sets, or in a digital format where allowed by the *code official*, with each application for a permit. The construction documents shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the *code official* is authorized to require necessary construction documents to be prepared by a registered design professional.

**Exception**: The *code official* is authorized to waive the requirements for construction documents or other supporting data if the *code official* determines they are not necessary to confirm compliance with this code.

**103.2 Information on Construction Documents.** Construction documents shall be drawn to scale on suitable material. Electronic media documents are permitted to be submitted where *approved* by the *code official*. Construction documents shall be of sufficient clarity to indicate the location, nature, and extent of the work proposed, and show in sufficient detail pertinent data and features of the building, systems, and equipment as herein governed. Details shall include, but are not limited to, the following as applicable:

1. Location and size of the *solar-ready zone.*
2. Structural design loads of roof dead load and roof live load.
3. Pathways for routing of conduit from the *solar-ready zone* to the electrical service panel.
4. Number and location of *EV capable light spaces.*
5. Number and location of *EV capable spaces.*
6. Number and location of *EV ready spaces.*
7. Number and location of *EVSE installed spaces.*
8. Locations of conduit and termination points serving the aforementioned parking spaces.
9. Location for condensate drainage where *combustion equipment* for space heating and water heating is installed.

**103.3 Examination of Documents.** The *code official* shall examine or cause to be examined the accompanying documents and shall ascertain whether the construction indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances. The *code official* is authorized to utilize a registered design professional, or other *approved* entity not affiliated with the building design or construction, in conducting the review of the plans and specifications for compliance with the code.

**103.3.1 Approval of Construction Documents.** When the *code official* issues a permit where construction documents are required, the construction documents shall be endorsed in writing and stamped "Reviewed for Code

Compliance". Such *approved* construction documents shall not be changed, modified, or altered without authorization from the *code official*. Work shall be done in accordance with the *approved* construction documents.

One set of "Reviewed for Code Compliance" construction documents shall be retained by the *code official*. The other set shall be returned to the applicant, kept at the site of work, and shall be open to inspection by the *code official* or a duly authorized representative.

**103.3.2 Previous Approvals.** This code shall not require changes in the construction documents, construction, or designated occupancy of a structure for which a lawful permit has been heretofore issued or otherwise lawfully authorized, and the construction of which has been pursued in good faith within 180 days after the effective date of this code and has not been abandoned; except that the *code official* is authorized to grant one or more extensions of time for additional periods not exceeding 180 days each.

**103.3.3 Phased Approval.** The *code official* shall have the authority to issue a permit for the construction of part of a solar ready, EV ready, or electric ready installation before the construction documents for the entire system have been submitted or *approved*, provided that adequate information and detailed statements have been filed complying with all pertinent requirements of this code. The holders of such permit shall proceed at their own risk without assurance that the permit for the entire solar ready, EV ready, or electric ready installation will be granted.

**I103.4 Amended Construction Documents.** Changes made during construction that are not in compliance with the *approved* construction documents shall be resubmitted for approval as an amended set of construction documents.

**103.5 Retention of Construction Documents.** One set of *approved* construction documents shall be retained by the *code official* for a period of not less than 180 days from the date of completion of the permitted work, or as required by state or local laws.

**103.6 Building Documentation and Closeout Submittal Requirements.** The construction documents shall specify that the documents described in this section be

provided to the building owner or owner's authorized agent within 90 days of the date of receipt of the certificate of occupancy.

**Exception:** *Residential buildings.*

**103.6.1 Record Documents.** Construction documents shall be updated to convey a record of the completed work. Such updates shall include mechanical, electrical, and control drawings that indicate all changes to size, type, and location of components, equipment, and assemblies.

**103.6.2 Compliance Documentation.** Compliance documentation and supporting calculations shall be delivered in one document to the building owner as a part of the project record documents or manuals, or as a standalone document. This document shall include the specific energy code edition utilized for compliance determination for each system.

**SECTION 104 INSPECTIONS.**

**104.1 General.** Construction or work for which a permit is required shall be subject to inspection by the *code official*, his or her designated agent or an *approved agency*, and such construction or work shall remain visible and able to be accessed for inspection purposes until *approved*. Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction. Inspections presuming to give authority to violate or cancel the provisions of this code or of other ordinances of the jurisdiction shall not be valid. It shall be the duty of the permit applicant to cause the work to remain visible and/or able to be accessed for inspection purposes. Neither the *code official* nor the jurisdiction shall be liable for expenses entailed in the removal or replacement of any material, product, system or building component required to allow an inspection to validate compliance with this code.

**104.2 Required Inspections.** The *code official*, his or her designated agent or an *approved agency*, upon notification, shall make the inspections set forth in Sections **104.2.1** through **104.2.4**.

**104.2.1 Solar Ready.** Inspections shall verify all of the following as required by this code, *approved* plans, and specifications:

1. The location and size of the *solar-ready zone* or the capacity of an installed on-site renewable energy system.
2. Electrical capacity and reserved physical space for circuit breakers in the main electrical service panel that are properly labeled.

**104.2.2 Electric Vehicle Ready.** Inspections shall verify all of the following as required by this code, *approved* plans, and specifications:

1. *EV* power transfer infrastructure requirements.
2. Electrical equipment associated with each parking space type, including branch circuits, conduit and/or raceway, junction boxes, receptacles, and *EVSE* are properly labeled and installed.
3. Electrical capacity and reserved physical space for circuit breakers in the main electrical service panel are properly labeled, if applicable.

**104.2.3 Electric Ready.** Inspections shall verify all of the following as required by this code, *approved* plans, and specifications:

1. Branch circuits, conduit and/or raceway, wiring, junction boxes, and receptacles for *future electric equipment* or appliances are properly labeled and installed, as applicable.
2. Reserved physical space for *future electric equipment* or appliances.
3. Electrical capacity and reserved physical space for circuit breakers in the main electrical service panel are properly labeled.

**104.2.4 Final Inspection.** The final inspection shall include verification of the installation and proper labeling of all requirements of this code.

**104.3 Reinspection.** A building shall be reinspected where determined necessary by the *code official*.

**104.4 Approved Inspection Agencies.** The *code official* is authorized to accept reports of third-party inspection agencies not affiliated with the building design or construction, provided that such agencies are *approved* as to qualifications and reliability relevant to the building components and systems that they are inspecting.

**104.5 Inspection Requests.** It shall be the duty of the holder of the permit or their duly authorized agent to notify the *code official* when work is ready for inspection. It shall

be the duty of the permit holder to provide access to and means for inspections of such work that are required by this code.

**104.6 Reinspection and Testing.** Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made to achieve compliance with this code. The work or installation shall then be resubmitted to the *code official* for inspection and testing.

**SECTION 105 NOTICE OF APPROVAL.**

**105.1 Approval.** After the prescribed inspections indicate that the work complies in all respects with this code, a notice of approval shall be issued by the *code official*.

**105.2 Revocation.** The *code official* is authorized to suspend or revoke, in writing, a notice of approval issued under the provisions of this code wherever the certificate is issued in error, or on the basis of incorrect information supplied, or where it is determined that the building or structure, premise, or portion thereof is in violation of any ordinance or regulation or any of the provisions of this code.

**SECTION 106 VALIDITY.**

**106.1 General.** If a portion of this code is held to be illegal or void, such a decision shall not affect the validity of the remainder of this code.

**SECTION 107 REFERENCED STANDARDS.**

**107.1 General.** The codes and standards referenced in this code shall be listed in Section **107.2**, and such codes and standards shall be considered as part of the requirements of this code to the prescribed extent of each such reference.

**107.2 Referenced Codes and Standards.** The codes and standards referenced in this code are as follows:

1. International Building Code
    a. Chapter 3
    b. Chapter 11
2. International Energy Conservation Code
3. International Fire Code

4. International Residential Code
5. National Electrical Code Article 625
6. UL2202 and 2594

**107.2.1 Conflicts.** Where conflicts occur between provisions of this code and referenced codes and standards, the provisions of this code shall apply.

**107.2.2 Provisions in Referenced Codes and Standards.** Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code, the provisions of this code, as applicable, shall take precedence over the provisions in the referenced code or standard.

**107.3 Applications of References.** References to chapter or section numbers, or to provisions not specifically identified by number, shall be construed to refer to such chapter, section, or provision of this code.

**107.4 Other Laws.** The provisions of this code shall not be deemed to nullify any provisions of local, state, or federal law.

**SECTION 108 STOP WORK ORDER.**

**108.1 Authority.** Where the *code official* finds any work regulated by this code being performed in a manner contrary to the provisions of this code or in a dangerous or unsafe manner, the *code official* is authorized to issue a stop work order.

**108.2 Issuance.** The stop work order shall be in writing and shall be given to the owner of the property, the owner's authorized agent, or the person performing the work. Upon issuance of a stop work order, the cited work shall immediately cease. The stop work order shall state the reason for the order and the conditions under which the cited work is authorized to resume.

**108.3 Emergencies.** Where an emergency exists, the *code official* shall not be required to give a written notice prior to stopping the work.

**108.4 Failure to Comply.** Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to fines established by [NAME OF JURISDICTION].

**SECTION 109 BOARD OF APPEALS.**

**109.1 General.** In order to hear and decide appeals of orders, decisions, or determinations made by the *code official* relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The *code official* shall be an ex officio member of said board but shall not have a vote on any matter before the board. The board of appeals shall be appointed by the governing body and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business and shall render all decisions and findings in writing to the appellant with a duplicate copy to the *code official*.

**109.2 Limitations on Authority.** An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an equally good or better form of construction is proposed. The board shall not have the authority to waive the requirements of this code.

**109.3 Qualifications.** The board of appeals shall consist of members who are qualified by experience and training and are not employees of [NAME OF JURISDICTION].

## Chapter 2 Definitions

**SECTION 201 GENERAL.**

**201.1 Scope.** Unless stated otherwise, the following words and terms in this code shall have the meanings indicated in this chapter.

**201.2 Interchangeability.** Words used in the present tense include the future; words in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural includes the singular.

**201.3 Terms Defined in Other Codes.** Terms that are not defined in this code but are defined in the International Building Code, International Fire Code, International Fuel Gas Code, International Mechanical Code, International Plumbing Code, International Energy Conservation Code, or International Residential Code shall have the meanings ascribed to them in those codes.

**201.4 Terms not Defined.** Terms not defined by this chapter or the codes listed under 201.3 shall have ordinarily accepted meanings such as the context implies.

**SECTION 202 GENERAL DEFINITIONS.**

**APPROVED.** Acceptable to the *code official*.

**APPROVED AGENCY.** An established and recognized agency that is regularly engaged in conducting tests or furnishing inspection services, or furnishing product certification, where such agency has been approved by the *code official.*

**CODE OFFICIAL.** The officer or other designated authority charged with the administration and enforcement of this code, or a duly authorized representative.

**COMBUSTION EQUIPMENT.** For this code, any equipment or appliance used for space-heating, service water heating, cooking, clothes drying or lighting that uses *fuel gas* or *fuel oil*.

**COMMERCIAL BUILDING.** For this code, all commercial buildings and R-Occupancies that are covered by the International Building Code.

**CORE AND SHELL.** The first phase of a commercial project that has the outer building envelope constructed and may contain interior lighting and heating and has not received a permanent Certificate of Occupancy.

**DIRECT CURRENT FAST CHARGER (DCFC) EVSE.** Equipment capable of fast charging on a 100A or higher 480VAC three-phase branch circuit. AC power is converted into a controlled DC voltage and current within the *EVSE* that will then directly charge the *electric vehicle*.

**ELECTRIC VEHICLE (EV).** An automotive-type vehicle for on-road use, including but not limited to, 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, *EVSE*, a rechargeable storage battery, a fuel cell, a photovoltaic array, or another source of electric current. Off-road, self-propelled electric mobile equipment, including but not limited to, industrial trucks, hoists, lifts, transports, golf carts, airline ground support equipment, tractors, and boats are not considered electric vehicles.

**ELECTRIC VEHICLE CAPABLE LIGHT SPACE (EV CAPABLE LIGHT SPACE).** A designated vehicle parking space that has conduit and/or raceway installed to support future implementation of *electric vehicle* charging installation, and has sufficient physical space adjacent to the existing electrical equipment for future electric upgrades.

**ELECTRIC VEHICLE CAPABLE SPACE (EV CAPABLE SPACE).** A designated vehicle parking space that has the electric panel capacity and conduit and/or raceway installed to support future implementation of *electric vehicle* charging.

**ELECTRIC VEHICLE READY SPACE (EV READY SPACE).** A designated vehicle parking space that has the electric panel capacity, raceway wiring, receptacle, and circuit overprotection devices installed to support future implementation of *electrical vehicle* charging.

**ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE).** An *electric vehicle* charging system or device that is used to provide electricity to a plug-in *electric vehicle* or *plug-in hybrid electric vehicle*, is designed to ensure that a safe connection has been made between the electrical grid and the vehicle, and is able to communicate with the vehicle's control system so that electricity flows at an appropriate voltage and current level.

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

**FIRST TENANT FINISH.** The first tenant finish(es) in a new structure or *core and shell* building that is credited towards meeting the requirements of this Chapter.

**FUEL GAS.** A natural gas, manufactured gas, liquefied petroleum gas, or mixtures of these gasses.

**FUEL OIL.** Kerosene or any hydrocarbon oil having a flash point of not less than 100°F (38°C).

**FUTURE ELECTRIC EQUIPMENT.** Equipment or appliances necessary to support future all-electric space and water heating, cooking, or clothes drying.

**PLUG-IN HYBRID ELECTRIC VEHICLE.** An *electric vehicle* having a second source of motive power.

**RESIDENTIAL BUILDING.** For this code, one- and two-family dwellings and townhouses as defined in the International Residential Code.

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

# Chapter 3 Electric Ready

## PART 1 RESIDENTIAL ELECTRIC READY

### SECTION RE301 SCOPE

**RE301.1 General.** These provisions shall be applicable for all new buildings, and major renovations and additions.

### SECTION RE302 ADDITIONAL ELECTRIC INFRASTRUCTURE

**RE302.1 Additional Electric Infrastructure.** *Combustion equipment* in *residential buildings* must meet the requirements of Sections **RE302.2** through **RE302.6**.

**Exceptions**:

1. Interior fireplaces that do not serve as a primary source of heating.
2. Exterior fireplaces and firepits.

**RE302.2 Combustion Equipment.** *Combustion equipment* shall be provided with all of the following:

1. A dedicated, appropriately phased branch circuit sized to accommodate *future electric equipment* or appliances to serve a comparable capacity to meet the heating load.

2. An electric receptacle or junction box that meets the requirements of Section **RE302.5**, and is connected to the electrical panel through the branch circuit. Each electrical receptacle or junction box shall have reasonable access to the *combustion equipment* or dedicated physical space for *future electric equipment* with no obstructions other than the current *combustion equipment*.

3. Where *combustion equipment* is used for space or water heating, dedicated physical space shall be provided for *future electric equipment,* including an electric resistance backup coil for ducted systems, if applicable.

   **Exception**: Dwelling units with installed air conditioning systems are not required to provide additional dedicated physical space for an outdoor heat pump.

**RE302.3 Electrical Panel Space.** The electrical panel shall have a reserved space for a minimum two-pole circuit breaker for each branch circuit provided for *future electric equipment* or appliances.

**RE302.4 Labeling.** The junction box or receptacle and the dedicated circuit breaker space serving *future electric equipment* or appliances in the electrical panel shall be labeled for their intended use.

**RE302.5 Adjacency.** The electrical receptacle or junction box must be provided within 3 feet of the *combustion equipment* or appliances, or within 3 feet of the dedicated physical space for *future electric equipment* or appliances.

   **Exception:** For *combustion equipment* dedicated to space or water heating, the electrical receptacle or junction box shall be located not more than 6 feet from the *combustion equipment* or the dedicated physical space for *future electric equipment*.

**RE302.6 Condensate Drain.** Where *combustion equipment* for space heating and water heating is installed, a location shall be provided for condensate drainage.

## PART 2 COMMERCIAL ELECTRIC READY

### SECTION CE301 SCOPE

**CE301.1 General.** These provisions shall be applicable for all new buildings, additions, and *first tenant finish* permits.

   **CE301.1.1 First Tenant Finishes.** In the case that a *first tenant finish* to a commercial *core and shell* building or unfinished space is credited towards meeting the requirements of this Chapter, the *code official* shall not issue a

Certificate of Occupancy to the tenant until the requirements of Section **CE302** are met.

**SECTION CE302 ADDITIONAL ELECTRIC INFRASTRUCTURE**

**CE302.1 Additional Electric Infrastructure.** *Combustion equipment* in *commercial buildings* shall meet the electric infrastructure requirements of Sections **CE302.2** or **CE302.3**.

**Exceptions:**

1. Interior fireplaces that do not serve as a primary source of heating.
2. Exterior fireplaces and fire pits.
3. Additions to buildings that do not provide new space-heating equipment will not be required to provide additional electrical infrastructure to the existing space-heating equipment.

**CE302.2 Commercial Buildings Less than 10,000 sq. ft. and all R-Occupancies.** *Commercial buildings* that have a gross floor area of less than 10,000 sq. ft., and all R-occupancies of any size, shall comply with Sections **CE302.2.1** through **CE302.2.5**.

**CE302.2.1 Combustion Equipment.** *Combustion equipment* shall be provided with all of the following:

1. A dedicated, appropriately phased branch circuit sized to accommodate *future electric equipment* or appliances to serve a comparable capacity to meet the heating load.

2. An electric receptacle or junction box that meets the requirements of Section **CE302.2.5**, and is connected to the electrical panel through the branch circuit. Each electrical receptacle or junction box shall have reasonable access to the *combustion equipment* or dedicated physical space for *future electric equipment* with no obstructions other than the current *combustion equipment*.

3. Where *combustion equipment* is used for space or water heating, dedicated space shall be provided for all *future electric equipment*,

including an electric resistance backup coil for ducted systems if applicable.

**Exception:** Buildings with installed air conditioning systems are not required to provide additional dedicated physical space for an outdoor heat pump.

**CE302.2.2 Electrical Panel Space.** The electrical panel shall have reserved physical space for a minimum two-pole or three-pole circuit breaker for each branch circuit provided for *future electric equipment* or appliances. The physical space in the electrical panel for each circuit breaker shall be sized with sufficient breaker capacity to meet the electrical demand of the *future electric equipment* or appliance that is sized to serve a comparable capacity to meet the heating load.

**CE302.2.3 Labeling.** The junction box or receptacle and the dedicated circuit breaker space serving *future electric equipment* or appliances in the electrical panel shall be labeled for their intended use.

**CE302.2.4 Adjacency.** The electrical receptacle or junction box must be provided within 3 feet of the *combustion equipment* or appliances or within 3 feet of the dedicated physical space for *future electric equipment* or appliances.

**Exception:** For *combustion equipment* dedicated to space or water heating, the electrical receptacle or junction box shall be located not more than 6 feet from the *combustion equipment* or the dedicated physical space for *future electric equipment*.

**CE302.2.5 Condensate Drain.** Where *combustion equipment* dedicated to space heating and water heating is installed, a location shall be provided for condensate drainage.

**CE302.3 Commercial Buildings 10,000 sq. ft. or Greater.** All *commercial buildings* that have a gross floor area of 10,000 sq. ft. or greater shall comply with the following requirements.

**Exception**: R-occupancies.

**CE302.3.1 Combustion Equipment or Appliances.** All *combustion equipment* shall be provided with the following:

1. A junction box that is located in the same physical space as the *combustion equipment* and is reasonably accessible, and that is connected to the electrical panel by continuous conduit and/or raceways.
2. Dedicated electrical panel space for an appropriately phased branch circuit sized to accommodate *future electric equipment* or appliances to serve a comparable capacity to meet the heating load.
3. Where *combustion equipment* is used for space and water heating, dedicated physical space shall be provided for all *future electric equipment*.

**CE302.3.2 Electrical Panel Space.** The electrical panel shall have reserved physical space for a minimum two-pole or three-pole circuit breaker for each branch circuit provided for *future electric equipment* or appliances. The physical space in the electrical panel for each circuit breaker shall be sized with sufficient breaker capacity to meet the electrical demand of the *future electric equipment* or appliance that is sized to serve a comparable capacity to meet the heating load.

**CE302.3.3 Labeling**. The dedicated circuit breaker space serving *future electric equipment* or appliances in the electrical panel shall be labeled "For future electric equipment".

**CE302.3.4 Physical Space.** Dedicated physical space shall be provided for additional electric equipment, including but not limited to transformers and cabinets, necessary for electrical service to *future electric equipment* or appliances.

# Chapter 4 Solar Ready

## PART 1 RESIDENTIAL SOLAR READY.

### SECTION RS401 SCOPE.

**RS401.1 General.** These provisions shall be applicable for new buildings, and major renovations and additions.

### SECTION RS402 SOLAR READY ZONE.

**RS402.1 General.** New *residential buildings* with not less than 600 square feet of roof area oriented between 110 degrees and 270 degrees of true north or that is a low-sloped roof, shall comply with Sections **RS402.2** through **RS402.8**.

**Exceptions**:

1. New residential dwelling units with a permanently installed on-site renewable energy system that provides electricity to the dwelling unit's electrical system.
2. A building where all areas of the roof that would otherwise meet the requirements of Section **RS402** are in full or partial shade for more than 70 percent of daylight hours annually.

**RS402.2 Construction Document Requirements for Solar-Ready Zone**. Construction documents shall indicate the *solar-ready zone*.

**RS402.3 Solar-Ready Zone Areas.** The total *solar-ready zone* area for each dwelling unit shall be not less than 300 square feet exclusive of mandatory access or setback areas as required by the International Fire Code. The *solar-ready zone* shall be composed of areas not less than 5 feet in width and not less than 80 square feet exclusive of access or setback areas as required by the International Fire Code.

**Exception**: 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 of conditioned space per townhouse unit shall have a *solar-ready zone* area of not less than 150 square feet.

**RS402.4 Obstructions.** *Solar-ready zones* shall be free from obstructions, including but not limited to, vents, chimneys, and roof-mounted equipment.

**RS402.5 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-ready 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 either existing at the time of permit application or planned for on the construction documents.

**RS402.6 Roof Load Documentation.** The structural design loads of roof dead load and roof live load shall be clearly indicated on the construction documents.

**RS402.7 Interconnection Pathway.** Construction documents shall indicate at least one potential pathway for routing of conduit and/or raceway from the *solar-ready zone* to the electrical service panel and shall be labeled as "Potential Pathway" on the construction documents.

**RS402.8 Electrical Service Reserved Space.** The main electrical service panel shall have sufficient reserved space to allow the 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.

**RS402.9 Construction Documentation Certificate.** A permanent certificate, indicating the *solar-ready zone* and other requirements of this Part, shall be posted near the electrical distribution panel, water heater, or other conspicuous location.

## PART 2 COMMERCIAL SOLAR READY

### SECTION CS401 SCOPE

**CS401.1 General.** These provisions shall be applicable for new buildings, and major renovations and additions.

## SECTION CS402 SOLAR-READY ZONE

**CS402.1 General.** A *solar-ready zone* shall be located on the roof of all new *commercial buildings* that are oriented between 110 and 270 degrees of true north or have low-sloped roofs. *Solar-ready zones* shall comply with Sections **CS402.2** through **CS402.7**.

**Exceptions:**

1. A building with a permanently-installed, on-site renewable energy system that meets the following criteria.
    a. The system produces the energy output equivalent to covering 40 percent of the net roof area with solar photovoltaic 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.
    b. The system is located on the roof or overhang of the building or on the roof or overhang of another structure located within 250 feet of the building, on the building premises, on covered parking, or another *approved* location installed with the building project and under the same property ownership.
2. A building with a *solar-ready zone* that is shaded for more than 70 percent of daylight hours annually.
3. A building where a licensed design professional certifies that the incident solar radiation available to the building is not suitable for a *solar-ready zone*.
4. A building where a licensed design professional certifies that the *solar-ready zone* area required by Section **CS402.3** cannot be met because of extensive rooftop equipment, skylights, vegetative roof areas, or other obstructions.

**CS402.2 Construction Document Requirements for a Solar-Ready Zone.** Construction documents shall indicate the *solar-ready zone*.

**CS402.3 Solar-Ready Zone Area.** The total *solar-ready zone* area shall not be 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 area shall be not less than 5 feet in width in the narrowest dimension.

The *solar-ready zone* shall be located on the roof or overhang of the building or on the roof or overhang of another structure located within 250 feet of the building, on the building premises, on covered parking, or another *approved* location installed with the building project and under the same property ownership .

**CS402.4 Obstructions.** *Solar-ready zones* shall be free from obstructions, including pipes, vents, ducts, HVAC equipment, skylights, and roof-mounted equipment.

**CS402.5 Roof Loads and Documentation.** The structural design loads for roof dead load and roof live load shall be indicated on the construction documents.

**CS402.6 Interconnection Pathway.** Construction documents shall indicate at least one potential pathway for routing of conduit and/or raceway from the *solar-ready zone* to an electrical service panel and shall be labeled as "Potential Pathway" on the construction documents.

**CS402.7 Electrical Service Reserved Space.** The main electrical service panel shall have a minimum bus bar rating of not less than 200 amps. The main electrical service panel shall have a reserved space to allow installation of a dual-pole circuit breaker for future solar electric. This space shall be labeled "For Future Solar Electric." The reserved space shall be positioned at the end of the panel that is opposite from the panel supply conductor connection.

## PART 3 RESIDENTIAL SOLAR PANEL CAPACITY

### SECTION RS410 SCOPE

**RS410.1 General.** These provisions shall be applicable for all new buildings, and major renovations and additions.

**RS410.2 Electric Service Reserved Space.** The main electrical service panel shall have sufficient 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.

> **Exception**: A dwelling unit that already must comply with the solar ready provisions in Chapter 4 or that has a permanently installed on-site renewable energy system that provides electricity to the dwelling unit's electrical system.

### PART 4 COMMERCIAL SOLAR PANEL CAPACITY

#### SECTION CS410 SCOPE

**CS410.1 General.** These provisions shall be applicable for new buildings, and major renovations and additions.

**CS410.2 Electric Service Reserved Space.** The main electrical service panel shall have a minimum bus bar rating of not less than 200 amps. The main electrical service panel shall have sufficient 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.

> **Exception:** A building that already must comply with the solar ready provisions in Chapter 4 or that has a permanently installed on-site renewable energy system that provides electricity to the building's electrical system.

## Chapter 5 Electric Vehicle Ready

### PART 1 RESIDENTIAL ELECTRIC VEHICLE READY

#### SECTION RV501 SCOPE

**RV501.1 General.** These provisions shall be applicable for all new buildings, and major renovations and additions.

## SECTION RV502 ELECTRIC VEHICLE POWER TRANSFER INFRASTRUCTURE

**RV502 Electric Vehicle Power Transfer Infrastructure.** New vehicle parking spaces for *residential buildings* shall be provided in accordance with Sections **RV502.1** and **RV502.3**.

**RV502.1 One- and Two-family Dwellings and Townhouses.** Each dwelling unit with a dedicated attached or detached garage or other onsite designated parking provided for the dwelling unit shall be provided with one *EV ready space* per dwelling unit.

**RV502.2 EV Ready Spaces.** Each *EV ready space* shall have a branch circuit that complies with all of the following:

1. Terminates at a receptacle, located within 3 feet of each *EV ready space* it serves. *EV ready* includes two adjacent parking spaces if the receptacle for the electrical facilities of this section is installed adjacent to and between both parking spaces.
2. Has a minimum circuit capacity of 8.3 kVA (40A 208/240V).
3. The electrical panel, electrical distribution equipment directory, and all outlets or enclosures shall be marked "For future electric vehicle supply equipment".

   **Exception:** A receptacle need not be provided if a hard-wired *EVSE* is installed.

**RV502.3 Identification.** Construction documents shall designate the *EV ready space* and indicate the locations of raceway and/or conduit and the termination points serving them. The circuits or spaces reserved in the electrical panel for *EV ready spaces* shall be clearly identified in the panel or subpanel directory.

# PART 2 COMMERCIAL ELECTRIC VEHICLE READY

## SECTION CV501 SCOPE

**CV501.1 General.** These provisions shall be applicable for all new buildings, and major renovations and additions.

## SECTION CV502 ELECTRIC VEHICLE POWER TRANSFER INFRASTRUCTURE

**CV502 Electric Vehicle Power Transfer Infrastructure.** Where new parking is provided for *commercial buildings,* it shall be provided with *electric vehicle* power transfer infrastructure in compliance with Sections **CV502.1** through **CV502.9**.

**CV502.1 Quantity.** The number of required *EVSE installed spaces, EV ready spaces, EV capable spaces,* and *EV capable light spaces* shall be determined in accordance with this Section and **Table CV502.1** based on the total number of provided vehicle parking spaces and shall be rounded up to the nearest whole number. This includes all covered parking under carports or detached garages.

**CV502.1.1** Where more than one parking lot is provided on a building site, the number of provided vehicle parking spaces required to have *EV* power transfer infrastructure shall be calculated separately for each parking lot.

**CV502.1.1.1** R-2 Occupancies, as defined in Chapter 3 of the International Building Code, shall use the total parking requirement for the entire development to determine the *EV* power transfer infrastructure requirements using **Table CV502.1**.

**CV502.1.2** For *commercial buildings* that install a *DCFC EVSE,* each *DCFC EVSE* installed shall be permitted to be substituted for other space types as follows:

1. *Commercial buildings* other than R-2 Occupancies shall be permitted to substitute up to 10 spaces when the building provides a minimum of 20 percent of parking spaces as a combination of *EV Capable*, *EV ready*, or *EVSE installed spaces*.
2. R-2 Occupancies shall be permitted to substitute up to 5 spaces when the building provides a minimum of 60 percent of parking spaces as a combination of *EV Capable light, EV Capable, EV ready*, or *EVSE installed spaces*.

**CV502.1.3** *EVSE installed spaces* that exceed the minimum requirements of this section are permitted to be used to meet minimum requirements for *EV ready spaces*, *EV capable spaces*, and *EV capable light spaces*.

**CV502.1.4** *EV ready spaces* that exceed the minimum requirements of this section are permitted to be used to meet minimum requirements for *EV capable spaces* and *EV capable light spaces*.

**CV502.1.5** *EV capable spaces* that exceed the minimum requirements of this section are permitted to be used to meet the minimum requirements for *EV capable light spaces*.

**CV502.1.6** All attached garages with direct connection to a dwelling unit will be required to have one *EV ready space*.

*Table CV502.1: EV Power Transfer Infrastructure Requirements*

| Building Type / Space Type | *EVSE Installed Space* | *EV Ready Space* | *EV Capable Space* | *EV Capable Light Space* |
|---|---|---|---|---|
| **All *commercial buildings*, except for R-2 occupancies, with 10 or less parking spaces.** | 0 | 2 spaces | 0 | 0 |
| ***Commercial buildings*, except for R-2 occupancies, with greater than 10 parking spaces.** | 2% of spaces | 8% of spaces | 10% of spaces | 10% of spaces |
| **R-2 occupancies with 10 or less parking spaces** | 0 | 15% of spaces | 10% of spaces | 10% of spaces |
| **R-2 occupancies with greater than 10 parking spaces.** | 5% of spaces | 15% of spaces | 10% of spaces | 30% of spaces |

**CV502.2 EV Capable Light Spaces.** Each *EV capable light space* shall comply with all of the following:

1. A continuous raceway and/or conduit shall be installed between a suitable electrical panel or other electrical distribution equipment and terminate within 3 feet of the *EV capable light space* and shall be capped. *EV capable light* includes two adjacent parking spaces if the raceway and/or conduit terminates adjacent to and between both parking spaces.
2. Installed raceway and/or conduit shall be sized and rated to supply a minimum of 208 volts and a minimum of 40-ampere rated circuits.
3. Dedicated physical space to accommodate all equipment necessary for electrical service to future *EVSE*.
4. The routing of the raceway and/or conduit must be noted on the construction documents and the raceway shall be permanently and visibly marked "EV CAPABLE" at the load center and termination point locations.

**CV502.3 EV Capable Spaces.** Each *EV capable space* shall comply with all of the following:

1. A continuous raceway and/or conduit shall be installed between a suitable electrical panel or other electrical distribution equipment and terminate within 3 feet of the *EV capable space* and shall be capped. *EV capable* includes two adjacent parking spaces if the raceway and/or conduit terminates adjacent to and between both parking spaces.
2. The installed raceway and/or conduit shall be sized and rated to supply a minimum of 208 volts and a minimum of 40-ampere rated circuits.
3. The electrical panel or other electrical distribution equipment to which the raceway and/or conduit connects shall have sufficient dedicated space and spare electrical capacity to supply a minimum of 208 volts and a minimum of 40-ampere rated circuits.
4. The termination point of the conduit and/or raceway and the electrical distribution equipment directory shall be marked: "For future electric vehicle supply equipment (EVSE)."
5. Reserved capacity shall be no less than 8.3 kVA (40A 208/240V) for each *EV capable space*.

**CV502.4 EV Ready Spaces.** Each *EV ready space* shall have a branch circuit that complies with all of the following:

1. Terminates at a receptacle or junction box located within 3 feet of each *EV ready space* it serves. *EV ready* includes two adjacent parking spaces if the receptacle is installed adjacent to and between both parking spaces.
2. Has a minimum circuit capacity of 8.3 kVA (40A 208/240V).
3. The electrical panel, electrical distribution equipment directory, and all outlets or enclosures shall be marked "For future electric vehicle supply equipment (EVSE)."

**CV502.5 Electric Vehicle Supply Equipment (EVSE).** All *EVSE* shall meet all of the following requirements:

1. The installed *EVSE* shall meet one of the following requirements:
    a. A power capacity of at least 6.2 kVa (or 30A at 208/240V) and has the ability to connect to the internet.
    b. An inductive charging system for battery-powered *electric vehicles* that:
        i. Is ENERGY STAR certified; and
        ii. Has the ability to connect to the internet.
2. An *electric vehicle* charging system shall be wall-mounted or pedestal style and may provide multiple cords to connect with *electric vehicles*.
3. An *electric vehicle* charging system shall be listed and labeled for *EV* charging and must comply with the current version of Article 625 of the National Electrical Code.

**CV502.6 EVSE Installed Spaces.** An installed *EVSE* with multiple output connections shall be permitted to serve multiple *EVSE installed spaces*. Each *EVSE* installed serving either a single *EVSE installed space* or multiple *EVSE installed spaces*, shall comply with all of the following:

1. Have a minimum charging rate in accordance with Section **CV502.7**.
2. Be located within 3 feet of each *EVSE installed space* it serves.
3. Be installed in accordance with Section **CV502.8**.
4. Have a minimum circuit capacity of 8.3 kVA (40A 208/240V).
5. Must meet the requirements of Section **CV502.5**.

**CV502.7 EVSE Minimum Charging Rate.** Each installed *EVSE* shall comply with one of the following:

1. Be capable of charging at a minimum rate of 6.2 kVA (or 30A at 208/240V).
2. When serving multiple *EVSE installed spaces* and controlled by an energy management system providing load management, be capable of simultaneously sharing each *EVSE installed space* at a minimum charging rate of no less than 3.3 kVA.

**CV502.8 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. When serving an accessible parking space, *EVSE* shall be accessible in accordance with the International Building Code Chapter 11.

**CV502.9 Identification.** Construction documents shall designate all *EVSE installed spaces, EV ready spaces, EV capable spaces,* and *EV capable light spaces,* and indicate the locations of raceway and/or conduit and termination points serving them. The circuits or spaces reserved for *EVSE installed spaces, EV ready spaces,* and *EV capable spaces* shall be clearly identified in the panel or subpanel directory. The raceway and/or conduit for *EV ready spaces, EV capable spaces* and *EV capable light spaces* shall be clearly identified at both the panel or subpanel and the termination point at the parking space.

## IBC APPENDIX CHAPTER K
# ADMINISTRATIVE PROVISIONS

### SECTION K111
### ELECTRICAL PROVISIONS

*Note: Delete the published text for Section K111.4 and replace it with provisions for electric vehicle charging receptacles.*

**K111.4 Electric vehicle (EV) charging receptacle outlets.** Level 2 (240-volt) electric vehicle (EV) charging receptacle outlets are to be installed for all new commercial, industrial or multiple-family residential buildings or additions or alterations to existing such buildings that increase the existing total floor area of the building by either fifty percent or by 5,000 square feet in accordance with Table K111.4. Charging receptacle outlets shall be installed in accordance with the requirements of Article 625 of the Electrical Code.

**TABLE K111.4**
**ELECTRIC VEHICLE (EV) CHARGING RECEPTACLE OUTLETS**

| TOTAL PARKING SPACES PROVIDED | 1-19 | 20-50 | 51-100 | 101-150 | 151-200 | 201-250 | 251-300 | 301-350 | 351-400 | 401-450 | 451-500 | 501 and over |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| REQUIRED MINIMUM NUMBER OF EV CHARGING OUTLETS | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 2% of total |

**R327.5.13 Weed barrier and gravel or crushed rock.** A weed barrier and gravel or crushed rock not less than ¾-inch in diameter applied at least 2 inches thick must be installed beneath decks, unenclosed floors, and around the perimeter of the building to extend at least 3 feet beyond the exterior walls and at least 2 feet beyond the driplines of decks, bay windows and other eaves and overhangs.

**Exception:** Noncombustible surfaces, such as poured concrete or asphalt, or other approved noncombustible materials, such as a weed barrier and brick, concrete or stone pavers, may satisfy this requirement.

### SECTION R328
### SOLAR PRE-WIRE OPTION

**R328.1 Solar pre-wire option.** In accordance with Section 1, Article 37.7 of title 38 of the Colorado Revised Statutes, every new single-family detached residence shall include one of the following:

1. A residential photovoltaic solar generation system or a residential solar thermal system, or both, or
2. Upgrades of wiring or plumbing, or both, installed by the builder to accommodate the future installation of a residential photovoltaic solar generation system or a residential solar thermal system, or both, or
3. A metallic chase or conduit, or both, constructed to allow ease of future installation of the necessary wiring or plumbing for a residential photovoltaic solar generation system or a residential solar thermal system, or both.

### IRC SECTION R329
### ELECTRIC VEHICLE CHARGING PRE-WIRE OPTION

**R329.1 Electric vehicle charging pre-wire option.** In addition to the one 125-volt receptacle outlet required for each car space by NEC Section 210.52(G)(1.), every new garage or carport that is accessory to a one- or two-family dwelling or townhouse shall include at least one of the following, installed in accordance with the requirements of Article 625 of the Electrical Code:

1. A Level 2 (240-volt) electric vehicle charging receptacle outlet, or
2. Upgraded wiring to accommodate the future installation of a Level 2 (240-volt) electric vehicle charging receptacle outlet, or
3. Electrical conduit to allow ease of future installation of a Level 2 (240-volt) electric vehicle charging receptacle outlet.

## IRC CHAPTER 4
# FOUNDATIONS

### SECTION R401
### GENERAL

**R401.3 Drainage.**

**R401.3.1 Gutters and downspouts.** Gutters, downspouts, and downspout extensions are required on all buildings.

**Exceptions:**

1. Post framed buildings.
2. Buildings where, in the opinion of the building official, the gutters will become damaged by sliding snow.
3. Roofs with eaves or overhangs of six feet or greater.
4. Roofs that are constructed with internal roof drains
5. Buildings where an approved alternate means of drainage is designed by a soils engineer or other qualified registered design professional.

## IRC CHAPTER 8
# ROOF-CEILING CONSTRUCTION

### SECTION R806
### ROOF VENTILATION

**R806.1 Roof ventilation.** See the provisions of Section R327.4.12 for attic ventilation in Wildfire Zone 1.

## IRC CHAPTER 9
# ROOF ASSEMBLIES

### SECTION R902
### ROOF COVERING MATERIALS

*Add a sentence to Section R902.1, as follows:*

**R902.1 Roof covering materials.** See Section R327.4.1 for roof covering materials requirements in Wildfire Zone 1 and Section R327.5.1 for roof covering materials requirements in Wildfire Zone 2.

### SECTION R903
### ROOF DRAINAGE

**R903.4.1.1 Sizing of roof drains, scuppers, and downspouts.** The rainfall amount to be used to size roof drainage components shall be 2.4 inches per hour.

**CB 102 General Definitions**

**MAJOR ALTERATION.** Any building where the work area exceeds 50 percent of the aggregate area of the building.

**CB103 Solar-Ready Zone**

**CB103.1 General.** A solar-ready zone shall be located on the roof of all new buildings that are subject to the commercial provisions of the IECC and that 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 CB103.9.

This section hereby creates and adopts a new **Appendix CD EV Readiness - Commercial:**

**APPENDIX CD**

**EV READINESS - COMMERCIAL**

**CD101 Scope**

**CD101.1 Purpose and Intent.** The purpose and intent of this Appendix CD is to accommodate the growing need for EV charging infrastructure. Including these measures during initial commercial construction substantially reduces the costs and difficulty of installing EV infrastructure at a later date.

**CD101.2. Applicability.** This Appendix CD shall apply to all new commercial construction to which the current International Building Code applies and to major alterations, which the current International Existing Building Code applies.

**Section CD102 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.

DIRECT CURRENT FAST CHARGING (DCFC) EVSE: EV power transfer infrastructure capable of fast charging on a 100A or higher 480VAC three-phase branch circuit. AC power is converted into a controlled DC voltage and current within the *EVSE* that will then directly charge the *electric vehicle*.

EV LOAD MANAGEMENT SYSTEM: A system designed to allocate charging capacity among multiple *EVSE* and that complies with the current National Electric Code.

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 an electric source.

ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE). Equipment for plug-in power transfer including the ungrounded, grounded, and equipment grounding conductors, and the *electric vehicle* connectors, attachment plugs, 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.

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, and 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 either an outlet, junction box or receptacle, that will support an installed *EVSE*.

MAJOR ALTERATION. Any building where the work area exceeds 50 percent of the aggregate area of the building.

UNIVERSAL VEHICLE CHARGING STATION. A charging station installed in a parking space for a minimum vehicle width of 120 inches (3048 mm) with 36-inch access aisles (915 mm) on each side.

**CD103 Electrical Vehicle Readiness**

**CD103.1 Electric vehicle power transfer infrastructure.** New parking facilities shall be provided with *electric vehicle* power transfer infrastructure in compliance with Sections CD104.1 through CD104.6, CD105, and CD106.

**CD103.2 Quantity.** The number of required *EVSE* spaces, *EV ready* spaces, and *EV capable* spaces shall be determined in accordance with this Section and Table CD104.1 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 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 *EVSE* spaces that exceed the minimum requirements of this section may be used to meet 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 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*, whichever is less, requirements for *EVSE* spaces for R-2 occupancies shall not apply.

6. In commercial multi-family (R-2, R-3, and R-4) complexes, four stories or greater, that contain multiple buildings, required EV spaces shall be dispersed throughout parking areas so that each building has access to a similar number of spaces per dwelling unit.

7. Requirements for a Group S-2 parking garage shall be determined by the occupancies served by that parking garage. Where new *automobile parking spaces* do not serve specific occupancies, the values for Group S-2 parking garage in Table CD104.1 shall be used.

8. Direct Current Fast Charging. The number of *EVSE* spaces for Groups A, B, E, I, M and S-2 Occupancies may be reduced by up to ten per *DCFC EVSE* provided that the building includes not less than one parking space equipped with a *DCFC EVSE* and not less than one *EV ready* space. A maximum of fifty spaces may be reduced from the total number of *EVSE* spaces.

**Exception:** Parking facilities, serving occupancies other than R-2 with fewer than 10 *automobile parking spaces*.

**TABLE CD103.1**

**REQUIRED EV POWER TRANSFER INFRASTRUCTURE**

| BUILDING TYPE | MINIMUM EV INSTALLED SPACES | MINIMUM EV READY SPACES | MINIMUM EV CAPABLE SPACES |
|---|---|---|---|
| **Group A, B, E, M** | **15%[b]** | **5%** | **30%** |
| **Group F, I, R-3, R-4** | **2%[b]** | **0%** | **5%** |
| **Group R-1 and R-2[a]** | **25%[b]** | **5%** | **60%** |
| **Group S-2 Parking Garages** | **10%[b]** | **5%** | **0%** |

a. Where all (100%) parking serving R-2 occupancies are EV ready spaces, requirements for EVSE spaces for R-2 occupancies shall not apply.

b. For each EV installed space above the required percentage, 4 EV ready spaces can be eliminated.

**CD103.2 EV capable spaces.** Each *EV capable* space used to meet the requirements of Section CD103.1 shall comply with all of 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 a suitable panelboard or other onsite electrical distribution equipment.
2. Installed raceway or cable assembly shall be sized and rated to supply a minimum circuit capacity in accordance with CD103.5
3. The electrical distribution equipment to which the raceway or cable assembly connects shall have sufficient dedicated space and spare electrical capacity for a 2-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)."
5. Reserved capacity shall be no less than 4.1 kVA (20A 208/240V) for each *EV capable* space.

**CD103.3 EV ready spaces.** Each branch circuit serving *EV ready* spaces used to meet the requirements of Section CD103.1 shall comply with all of 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 circuit capacity in accordance with CD104.5.
3. The panelboard or other 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)."

**CD103.4 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 CD103.1, serving either a single *EVSE* space or multiple *EVSE* spaces, shall comply with all of the following:

1. Have a minimum circuit capacity in accordance with CD103.5.
2. Have a minimum charging rate in accordance with CD103.4.1.
3. Be located within 3 feet (914 mm) of each *EVSE* space it serves.
4. Be installed in accordance with Section CD103.6 and CD103.7.

**CD103.4.1 EVSE minimum charging rate.** Each installed *EVSE* shall comply with one of the following:

1. Be capable of charging at a minimum rate of 6.2 kVA (or 30A at 208/240V).
2. When serving multiple *EVSE* spaces and controlled by an energy management system providing load management, be capable of simultaneously charging each *EVSE* space at a minimum rate of no less than 3.3 kVA.

3. When serving *EVSE* spaces allowed to have a minimum circuit capacity of 2.7 kVA in accordance with CD103.5.1 and controlled by an energy management system providing load management, be capable of simultaneously charging each *ESVE* space at a minimum rate of no less than 2.1 kVA.

**CD103.5 Disbursement.** Required EVSE, EV Ready, and EV Capable spaces shall be disbursed throughout parking areas in commercial developments that contain multiple buildings so that each building has access to roughly the same number of spaces.

**CD103.6 Circuit capacity.** The capacity of electrical infrastructure serving each *EV capable* space, *EV ready* space, and *EVSE* space shall comply with one of the following:

1. A branch circuit shall have a rated capacity not less than 8.3 kVA (or 40A at 208/240V) for each EV ready space or *EVSE* space it serves.
2. The requirements of CD103.5.1.

**CD103.6.1 Circuit capacity management.** The capacity of each branch circuit serving multiple *EVSE* spaces, *EV ready* spaces or *EV capable* spaces designed to be controlled by an energy management system providing load management in accordance with NFPA 70, shall comply with one of the following:

1. Have a minimum capacity of 4.1 kVA per space.
2. Have a minimum capacity of 2.7 kVA per space when serving *EV ready* spaces or *EVSE* spaces for a building site where all (100%) of the automobile parking spaces are designed to be *EV ready* or *EVSE* spaces.

**CD103.7 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.

**CD103.8. EVSE ENERGY STAR.** All *EVSE* shall be ENERGY STAR certified.

**CD104 Universal Vehicle Charging Stations.**

**CD104.1 Universal vehicle charging stations.** Where *electric vehicle* charging stations are provided for public use, or where *electric vehicle* charging stations are shared by multiple multi-family dwelling units, the number of universal vehicle charging stations shall be provided in accordance with Table CD104.1. When multiple stalls are required, access aisles may be shared.

**TABLE CD104.1**

**UNIVERSAL EV SPACE REQUIREMENTS**

| TOTAL # OF EV CHARGING STATIONS | MINIMUM # OF UNIVERSAL VEHICLE CHARGING STATIONS |
|---|---|

| | |
|---|---|
| **1 or more** | **25%** |

**CD105. Identification.**

**CD105.1 Identification.** Construction documents shall designate all *EV capable* spaces, *EV ready* spaces and *EVSE* spaces and indicate the locations of conduit and termination points serving them. The circuit breakers or circuit breaker spaces reserved for the *EV capable* spaces, *EV ready* spaces, and *EVSE* spaces shall be clearly identified in the panel board directory. The conduit for *EV capable* spaces shall be clearly identified at both the panel board and the termination point at the parking space.

**Residential Provisions of the IECC**

**Section R101 Scope and General Requirements**

**R101.1 Title.** This code shall be known as the International Energy Conservation Code of the City of Lafayette, Colorado, and shall be cited as such. It is referred to herein as "this code".

**Section R103 Construction Documents**

**Section R103.2 Information on construction documents,** is amended by adding items 10, 11, and 12 as follows:

10. Details of additional electric infrastructure, including branch circuits, conduit, or pre-wiring, and panel capacity in compliance with the provisions of this code.
11. Location of pathways for routing of raceways or cable from the solar ready zone to the electrical service panel.
12. Location of designated EVSE spaces, EVSE Universal spaces, EV-Ready spaces, and EV-Capable spaces in parking facilities, as applicable.

**Section R202 GENERAL DEFINITIONS** is amended to add the following definitions in alphabetical order:

ALL-ELECTRIC BUILDING. A *building* and building site that contains no *combustion equipment*, or plumbing for *combustion equipment*, and that uses heat pump technology as the primary supply for heating, cooling, and service water heating loads.

COMBUSTION EQUIPMENT: Any equipment or appliances used for space heating, cooling, water heating (including pools and spas), cooking, clothes drying or lighting that uses natural gas, propane, other fuel gas, or fuel oil.

INVOLUNTARY DEMOLITION OR INVOLUNTARY DESTRUCTION. The destruction or demolition of a structure caused by natural forces such as fire, flood, or tornado but not by human forces or human error.

**R408.2.2 More efficient HVAC equipment.** Heating and cooling equipment shall meet one of the following efficiencies:

1. Greater than or equal to 10 HSPF/16 SEER air source heat pump.

2. Greater than or equal to 3.5 COP ground source heat pump.

Section R408.2.3 Reduced energy use in service water-heating option is amended as follows:

**R408.2.3 Reduced energy use in service water-heating option.** The hot water system shall meet one of the following efficiencies:

1. Greater than or equal to 2.0 EF electric service water-heating system.

2. Greater than or equal to 0.4 solar fraction solar water-heating system.

Appendix RB is hereby adopted and amended to read: "**Appendix RB Solar Ready Provisions."**

**Section RB101 Scope**

**RB101.1 General.** These provisions shall be applicable for new construction and major alterations where solar-ready provisions are required.

**RB103 Solar-Ready Zone**

**RB103.1 General.** New residential buildings with not less than 600 square feet (55.74 m 2) of roof area oriented between 110 degrees and 270 degrees of true north shall comply with Sections RB103.2 through RB103.8.

**Exceptions:**

1. 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.

This section hereby creates and adopts a new **Appendix RD EV Readiness – Residential:**

**APPENDIX RD**

**EV READINESS - RESIDENTIAL**

**RD101 Scope**

**RD101. Purpose and intent.** The purpose and intent of this Appendix RD is to accommodate the growing need for EV charging infrastructure, in particular meeting preferences for charging at home. Including these measures during initial construction substantially reduces the costs and difficulty of installing future EV infrastructure.

**RD101.2 Applicability.** This Appendix RD shall apply to all new residential construction and to major alterations to which the International Residential Code applies.

**RD102. 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.

DIRECT CURRENT FAST CHARGING (DCFC) EVSE: EV power transfer infrastructure capable of fast charging on a 100A or higher 480VAC three-phase branch circuit. AC power is converted into a controlled DC voltage and current within the *EVSE* that will then directly charge the *electric vehicle*.

EV LOAD MANAGEMENT SYSTEM: A system designed to allocate charging capacity among multiple *EVSE* and that complies with the current National Electric Code.

ELECTRIC VEHICLE (EV). An automotive-type vehicle for on-road use, such as passenger automobiles, buses, trucks, vans, neighborhood *electric vehicle*s, and electric motorcycles, primarily powered by an electric motor that draws current from an electric source.

ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE). Equipment for plug-in power transfer including the ungrounded, grounded, and equipment grounding conductors, and the *electric vehicle* connectors, attachment plugs, 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.

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, and 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 either an outlet, junction box or receptacle, that will support an installed *EVSE*.

MAJOR ALTERATION. Any building where the work area exceeds 50 percent of the aggregate area of the building.

UNIVERSAL VEHICLE CHARGING STATION. A charging station installed in a parking space for a minimum vehicle width of 120 inches (3048 mm) with 36-inch access aisles (915 mm) on each side.

**RD103 One- and two- Family Dwellings and Townhouses**

**RD103.1 General.** One *EV ready* space shall be provided for each dwelling unit. The branch circuit shall be identified as *EV ready* in the service panel or subpanel directory, and the termination location shall be marked as *EV ready*.

**Exception:** Dwelling units where no parking spaces are either required or provided.

**RD103.1.1 Receptacle.** The EV ready space shall be provided with a receptacle, over current protection, and GFCI protection as required by NFPA 70.

**RD103.1.2 Voltage and ampacity.** The EV ready space shall be supplied with 240 volts and 40 amps.

**RD104 Residential Multi-Family Dwellings**

**RD104.1 General.** New dwelling units for residential multi-family buildings, other than duplexes and townhomes, shall be provided with *electric vehicle* power transfer infrastructure in compliance with Sections RD104.1 through RD104.6 and Sections RD105 through RD106.

**RD104.2 Quantity.** The number of required *EVSE* spaces, *EV ready* spaces, and *EV capable* spaces shall be determined in accordance with this Section and Table RD105.1 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 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. Installed *EVSE* spaces that exceed the minimum requirements of this section may be used to meet minimum requirements for *EV ready* spaces and *EV capable* spaces.
3. Installed *EV ready* spaces that exceed the minimum requirements of this section may be used to meet minimum requirements for *EV capable* spaces.
4. 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.
5. In residential multi-family complexes that contain multiple buildings, required EV spaces shall be dispersed throughout parking areas so that each building has access to a similar number of spaces per dwelling unit.

**TABLE RD104.2**

**REQUIRED EV POWER TRANSFER INFRASTRUCTURE FOR MULTI-FAMILY**

| BUILDING TYPE | MINIMUM EV INSTALLED SPACES | MINIMUM EV READY SPACES | MINIMUM EV CAPABLE SPACES |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **Group R-1 and R-2[a]** | **15%** | **5%** | **40%** |
| **Group R-3 and R-4** | **2%** | **0%** | **5%** |

a. Where all (100%) parking serving R-2 occupancies are EV ready spaces, requirements for *EVSE* spaces for R-2 occupancies shall not apply.

**RD104.3 EV capable spaces.** Each *EV capable* space used to meet the requirements of Section RD105.1 shall comply with all of 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 a suitable panelboard or other onsite electrical distribution equipment.
2. Installed raceway or cable assembly shall be sized and rated to supply a minimum circuit capacity in accordance with RD104.5
3. The electrical distribution equipment to which the raceway or cable assembly connects shall have sufficient dedicated space and spare electrical capacity for a 2-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)."
5. Reserved capacity shall be no less than 4.1 kVA (20A 208/240V) for each *EV capable* space.

**RD104.4 EV ready spaces.** Each branch circuit serving *EV ready* spaces used to meet the requirements of Section RD105.1 shall comply with all of 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 circuit capacity in accordance with RD104.5.
3. The panelboard or other 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)."

**RD104.5 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 RD104.1, serving either a single *EVSE* space or multiple *EVSE* spaces, shall comply with all of the following:

1. Have a minimum circuit capacity in accordance with RD104.5.
2. Have a minimum charging rate in accordance with RD104.4.1.
3. Be located within 3 feet (914 mm) of each *EVSE* space it serves.

4. Be installed in accordance with Section RD104.6 and RD104.7

**RD104.5.1 EVSE minimum charging rate.** Each installed *EVSE* shall comply with one of the following:

1. Be capable of charging at a minimum rate of 6.2 kVA (or 30A at 208/240V).
2. When serving multiple *EVSE* spaces and controlled by an energy management system providing load management, be capable of simultaneously charging each *EVSE* space at a minimum rate of no less than 3.3 kVA.
3. When serving *EVSE* spaces allowed to have a minimum circuit capacity of 2.7 kVA in accordance with RD104.5.1 and controlled by an energy management system providing load management, be capable of simultaneously charging each *ESVE* space at a minimum rate of no less than 2.1 kVA.

**RD 104.6 Disbursement.** Required EVSE, EV ready, and EV capable spaces shall be disbursed throughout the parking areas in Residential Multi-family developments that contain multiple buildings so that each building has access to roughly the same number of spaces.

**RD104.7 Circuit capacity.** The capacity of electrical infrastructure serving each *EV capable* space, *EV ready* space, and *EVSE* space shall comply with one of the following:

1. A branch circuit shall have a rated capacity not less than 8.3 kVA (or 40A at 208/240V) for each EV ready space or *EVSE* space it serves.
2. The requirements of RD104.5.1.

**RD104.7.1 Circuit capacity management.** The capacity of each branch circuit serving multiple *EVSE* spaces, EV ready spaces or EV capable spaces designed to be controlled by an energy management system providing load management in accordance with NFPA 70, shall comply with one of the following:

1. Have a minimum capacity of 4.1 kVA per space.
2. Have a minimum capacity of 2.7 kVA per space when serving *EV ready* spaces or *EVSE* spaces for a building site when all (100%) of the automobile parking spaces are designed to be *EV ready* or *EVSE* spaces.

**RD104.8 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.

**RD104.9. EVSE ENERGY STAR.** All *EVSE* shall be ENERGY STAR certified.

**RD105 Universal vehicle charging stations**

**RD105.1 General.** Where *electric vehicle* charging stations are provided for public use, or where *electric vehicle* charging stations are shared by multiple multi-family dwelling units, the number of universal vehicle charging stations shall be provided in accordance with Table RD105.1. When multiple stalls are required, access aisles may be shared.

**TABLE RD105.1**

**UNIVERSAL EV SPACE REQUIREMENTS**

| TOTAL # OF EV CHARGING STATIONS | MINIMUM # OF UNIVERSAL VEHICLE CHARGING STATIONS |
|---|---|
| 1 or more | 25% |

**RD106. Identification**

**RD 106.1 General.** Construction documents shall designate all EV Capable spaces, EV Ready spaces and EV Installed spaces and indicate the locations of conduit and termination points serving them. The circuit breakers or circuit breaker spaces reserved for the EV Capable spaces, EV Ready spaces, and EV Installed spaces shall be clearly identified in the panel board directory. The conduit for EV Capable spaces shall be clearly identified at both the panel board and the termination point at the parking space.

**Article 10 – Amendments to the 2021 International Swimming Pool and Spa Code**

**Chapter 1.** Chapter 1 is hereby deleted. Please refer to the 2021 International Building Code Chapter 1 and 2023 Lafayette Building Code Chapter 1 amendments to the International Building Code for Scope and Administrative requirements.

**Article 11 – Amendments to the 2021 International Property Maintenance Code**

**Chapter 1.** Chapter 1 is hereby deleted. Please refer to the 2021 International Building Code Chapter 1 and 2023 Lafayette Building Code Chapter 1 amendments to the International Building Code for Scope and Administrative requirements.

**RESOLUTION NO. 1**
**SERIES 2024**

**A RESOLUTION RECOMMENDING APPROVAL OF AN ORDINANCE AMENDING LOUISVILLE MUNICIPAL CODE SECTION 17.20.170 - ELECTRIC VEHICLE CHARGING INFRASTRUCTURE**

**WHEREAS,** the City of Louisville is a Colorado home rule municipal corporation duly organized and existing under laws of the State of Colorado and the City Charter; and

**WHEREAS**, City of Louisville municipal code Title 17, Zoning, establishes standards for the development of land within the City, including standards for parking and energy efficient development; and

**WHEREAS**, by Ordinance No. 1816 adopted on October 19, 2021, the City Council amended the Zoning Code to require new construction include electric vehicle charging infrastructure; and

**WHEREAS,** the City of Louisville remains committed to its adopted goals to reduce energy consumption, increase clean energy sources, and support the transition to a low-carbon community as outlined in the Sustainability Action Plan and Resolution 25, Series 2019, "A Resolution Setting Clean Energy and Carbon Reduction Goals";

**WHEREAS**, the Planning Commission desires to amend the City's electric vehicle charging standards to better align with the Colorado Model Electric Ready and Solar Ready Code, published June 1, 2023 by the Colorado Energy Office; and

**NOW THEREFORE, BE IT RESOLVED** that the Planning Commission of the City of Louisville, Colorado does hereby recommend approval of an ordinance amending Title 17 of the Louisville Municipal Code concerning Electric Vehicle Charging Infrastructure with the following conditions:

- Provide language to ensure a minimum "Level 2" EV charging station standards for installed spaces.
- Change R-2 multi-family residential occupancy with 10 or fewer parking spaces to require at least one installed EVSE Installed Space.
- Add language so that if EVSE Installed Spaces are provided above the minimum number that a credit can be provided to the required number of EV Capable, EV Ready or EV Ready Light Spaces.
- Require labeling in electrical panels for the spaces reserved for breakers to support future EV Capable Spaces.

**PASSED AND ADOPTED** this 8th day of February, 2024.

By: _____

Steve Brauneis, Chair
Planning Commission

Attest: _____
Jeffrey Moline, Secretary
Planning Commission

City of Louisville
COLORADO • SINCE 1878

# DRAFT Memorandum

**To:** **Louisville City Council Members**

**From:** **Louisville Sustainability Advisory Board**

**Date:** **May 15, 2024**

**Re:** **Energy Code Amendments**

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Dear Louisville City Councillors,

The Louisville Sustainability Advisory Board understands that City Council will consider several amendments to the City's building codes at its meeting on 4 June 2024. The Board reviewed and discussed these amendments at its March, April, and May meetings. While City staff provided a thorough report, the Board would have appreciated more information concerning the genesis of the proposed amendments.

We offer some advice on these amendments just below. To frame our advice, we remind City Council that climate change presents humanity with a crisis of unparalleled proportions to which humanity has so far responded inadequately, that the City has set decarbonization goals in an attempt to respond to this crisis, and that the City's latest residential and commercial building codes are integral to achieving these goals. We further remind City Council that the City's latest building codes are not exceptional: several municipalities in Colorado have adopted the 2021 International Energy Conservation Code, and the State of Colorado has essentially mandated widespread adoption; Lafayette and Crested Butte recently adopted building codes with electrification mandates (allowing for certain exemptions), and Boulder is currently considering similar legislation; and the City's commercial building codes were modeled on those of other municipalities including Boulder. We finally remind City Council that the Board wholeheartedly supported adoption of the City's latest building codes, and we again thank City Council for authorizing their adoption.

First, we address the proposed amendments to the City's electric vehicle infrastructure code. City staff have proposed that the City replace its current code with the State of Colorado's

recommendations. While the City's code and the State's recommendations are very similar in many respects, and while the Board generally supports regional alignment on such legislation as building codes, we also recognize that Louisville differs from other communities across Colorado and that Louisville has a celebrated history of sustainability leadership. Of relevance in this case, Louisville has higher rates of adoption of electric vehicles than many other communities across Colorado, and Louisville has more aggressive decarbonization goals than the State and many of its other communities. Accordingly, the Board advises City Council to consider a compromise between the City's electric vehicle infrastructure code and the State's recommendations. Specifically, the Board endorses the Planning Commission's recommendations.

Next, we address the proposed amendments to the City's residential and commercial building codes. Several of these amendments are essentially clarifications or corrections; the Board most certainly supports these amendments. The remaining amendments represent weakenings of the City's building codes as far as efficiency and electrification are concerned; the Board recommends that City Council consider compromises between the City's current building codes and the proposed amendments. We provide brief recommendations for each such amendment.

- *All-electric requirements for commercial space and water heating*: The Board recommends retaining the all-electric space and water heating requirements for alterations and additions if existing equipment is replaced or if additional heating units are installed. Accordingly, existing equipment, no matter its power source, may continue to be used for the extent of its useful lifetime.
- *Natural gas backup for commercial space heating*: The Board recommends that natural gas backups for commercial space heating only be permitted if existing natural gas space heating equipment is being retained to serve this function.
- *Post-construction compliance and documentation for new commercial construction*: The Board supports post-construction compliance and documentation, through monitoring and metering, of the energy use intensity standards for new commercial buildings, but we appreciate the burden that such compliance and documentation places on building owners and City staff. Accordingly, we endorse removal of these requirements, but we strongly believe that legislation will mandate monitoring and metering of greenhouse gas emissions in the relatively near future.
- *Minimum heat pump standards*: The Board supports the amended minimum heat pump standards.

- *Furnace efficiency standards*: The Board recommends maintaining furnace efficiency standards but creating a simple waiver for cases in which products meeting these standards are not readily available.
- *Commercial door U-value standards*: The Board recommends maintaining commercial door U-value standards but creating a simple waiver for cases in which products meeting these standards are not readily available.
- *Electric vehicle infrastructure for altered parking*: The Board recommends that electric vehicle charging standards apply to any added parking but not to any reconfigured parking.
- *Passive house certification*: The Board recommends that the City allow passive house certification from both PHI and PHIUS as an alternative to Appendix RC of the 2021 IECC.

The Board strongly believes that legislation will mandate electrification retrofits of existing residential and commercial buildings in the relatively near future. By electrifying their buildings during construction, alteration, or addition, building owners will likely bear lower costs in the long term.

If the City can offer any assistance to meet or incentives to exceed the current building codes, then the Board would be most supportive of such efforts. The Board has recommended to City staff that the City provide incentives for commercial and residential efficiency and electrification upgrades in the next biennial budget.

Thank you for considering our advice.

Sincerely,
The Louisville Sustainability Advisory Board