Standards for Electrification and EV Charging

This document contains sections of the 2022 CALGreen Code that were amended by the City. For a complete version of the CALGreen Code, visit: [2022 CALGreen (iccsafe.org)]

Contents

Chapter 2 Definitions

Section 202 Definitions

This list includes only definitions relevant to electrification and EV charging standards in the sections that follow. For a complete list of CALGreen definitions, visit: [2022 CALGreen (iccsafe.org)]

ACCESSORY DWELLING UNIT. An attached or detached residential dwelling unit that provides complete independent living facilities for one or more persons and is located on a lot with a proposed or existing primary residence. Accessory dwelling units shall include permanent provisions for living, sleeping, eating, cooking and sanitation on the same parcel as the single-family or multifamily dwelling is or will be situated. (See Government Code Section 65852.2.)

ADDITION. An extension or increase in floor area of an existing building or structure.

AFFORDABLE HOUSING. Residential buildings that entirely consist of units below market rate and whose rents or sales prices are governed by local agencies to be affordable based on area median income.

ALL-ELECTRIC BUILDING. A building that contains no combustion equipment or plumbing from combustion equipment serving space heating (including fireplaces), water heating, (including pools and spas), cooking appliances (including barbeques), and clothes drying, within the building or property lines, and instead uses electric heating appliances for service.

ALTERATION OR ALTER. Any construction or renovation to an existing structure other than repair for the purpose of maintenance or addition.

AUTOMATIC LOAD MANAGEMENT SYSTEM (ALMS). A control system designed to manage load across one or more electric vehicle supply equipment (EVSE), circuits, panels and to share electrical capacity and/or automatically manage power at each connection point. ALMS systems shall be designed to deliver no less than 3.3 kVa 208/240 volt, 16-ampere) to each EV Capable, EV Ready or EVCS space served by the ALMS, and meet the requirements of California Electrical Code Article 625. The connected amperage to the building site for the EV charging infrastructure shall not be lower than the required connected amperage per California Green Building Standards Code, Title 24 Part 11.

CALIFORNIA BUILDING CODE. The current version of the *California Building Code.*

CALIFORNIA ELECTRICAL CODE. The current version of the *California Electrical Code.*

CALIFORNIA ENERGY CODE. The current version of the *California Energy Code*, unless otherwise specified.

CALIFORNIA MECHANICAL CODE. The current version of the *California Mechanical Code*.

CALIFORNIA PLUMBING CODE. The current version of the *California Plumbing Code*.

CALIFORNIA RESIDENTIAL CODE. The current version of the *California Residential Code*.

COMBUSTION EQUIPMENT. Any equipment or appliance used for space heating, water heating, cooking, clothes drying and/or lighting that uses fuel gas.

COMMERCIAL FOOD HEAT-PROCESSING EQUIPMENT. An equipment used in a food establishment for heat-processing food or utensils and that produces grease vapors, steam, fumes, smoke, or odors that are required to be removed through a local exhaust ventilation system, as defined in the California Mechanical Code.

DIRECT CURRENT FAST CHARGING (DCFC). A parking space provided with electrical infrastructure that meets the following conditions:

i. A minimum of 48 kVa (480 volt, 100-ampere) capacity wiring.
ii. Electric vehicle supply equipment (EVSE) located within three (3) feet of the parking space providing a minimum capacity of 80-ampere.

ELECTRIC HEATING APPLIANCE. A device that produces heat energy to create a warm environment by the application of electric power to resistance elements, refrigerant compressors, or dissimilar material junctions, as defined in the California Mechanical Code.

ELECTRIC VEHICLE (EV). An automotive-type vehicle for on-road use, such as passenger automobiles, buses, trucks, vans, neighborhood electric vehicles, electric motorcycles and the like, primarily powered by an electric motor that draws current from a rechargeable storage battery, fuel cell, photovoltaic array or other source of electric current. Plug-in hybrid electric vehicles (PHEV) are considered electric vehicles. For purposes of the *California Electrical Code*, off-road, self-propelled electric vehicles, such as industrial trucks, hoists, lifts, transports, golf carts, airline ground support equipment, tractors, boats and the like, are not included.

ELECTRIC VEHICLE (EV) CHARGER. Off-board charging equipment used to charge an electric vehicle.

ELECTRIC VEHICLE CHARGING SPACE (EV SPACE). A space intended for future installation of EV charging equipment and charging of electric vehicles.

ELECTRIC VEHICLE CHARGING STATION (EVCS). A parking space that includes installation of electric vehicle supply equipment (EVSE) at an EV Ready space. An EVCS space may be used to satisfy EV Ready space requirements. EVSE shall be installed in accordance with the California Electrical Code, Article 625.

ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE). The conductors, including the ungrounded, grounded and equipment grounding conductors and the electric vehicle connectors, attachment plugs, 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.

ENFORCING AGENCY. The designated department or agency as specified by statute or regulation.

FUEL GAS. A gas that is natural, manufactured, liquefied petroleum, or a mixture of these.

GREEN BUILDING. A holistic approach to design, construction and demolition that minimizes the building's impact on the environment, the occupants and the community.

HIGH-RISE RESIDENTIAL BUILDING. For the purposes of *CALGreen*, any building that is of Occupancy Group R and is four stories or greater in height.

HOTEL OR MOTEL. Any building containing six or more guest rooms intended or designed to be used, or which are used, rented or hired out to be occupied or which are occupied for sleeping purposes by guests.

JUNIOR ACCESSORY DWELLING UNIT. A unit that is no more than 500 square feet in size and contained entirely within an existing single-family structure. A junior accessory dwelling unit may include separate sanitation facilities, or may share sanitation facilities with the existing structure. (See Government Code Section 65852.22.)

LEVEL 1 EV READY. A parking space that is served by a complete electric circuit with the following requirements:

i. A minimum of 2.2 kVa (110/120 volt, 20-ampere) capacity wiring.
ii. A receptacle labeled "Electric Vehicle Outlet" or electric vehicle supply equipment located within three (3) feet of the parking space. If EVSE is provided the minimum capacity of the EVSE shall be 16-ampere.
iii. Conduit oversized to accommodate future Level 2 EV Ready (208/240 volt, 40 - ampere) at each parking space.

LEVEL 2 EV CAPABLE. A parking space provided with electrical infrastructure that meets the following requirements:

i. Conduit that links a listed electrical panel with sufficient capacity to a junction box or receptacle located within three (3) feet of the parking space.
ii. The conduit shall be designed to accommodate at least 8.3 kVa (208/240 volt, 40 - ampere) per parking space. Conduit shall have a minimum nominal trade size of 1 inch inside diameter and may be sized for multiple circuits as allowed by the California Electrical Code. Conduit shall be installed at a minimum in spaces that will be inaccessible after construction, either trenched underground or where penetrations to walls, floors, or other partitions would otherwise be required for future installation of branch circuits, and such additional elements deemed necessary by the Building Official. Construction documents shall indicate future completion of conduit from the panel to the parking space, via the installed inaccessible conduit.
iii. The electrical panel shall reserve a space for a 40-ampere overcurrent protective device space(s) for EV charging, labeled in the panel directory as "EV CAPABLE."
iv. Electrical load calculations shall demonstrate that the electrical panel service capacity and electrical system, including any on -site distribution transformer(s), have sufficient capacity to simultaneously charge all EVs at all required EV spaces at a minimum of 40 amperes.
v. The parking space shall contain signage with at least a 12" font adjacent to the parking space indicating the space is EV Capable.

LEVEL 2 EV READY. A parking space that is served by a complete electric circuit with the following requirements:

i. A minimum of 8.3 kVa (208/240 volt, 40-ampere) capacity wiring.
ii. A receptacle labeled "Electric Vehicle Outlet" or electric vehicle supply equipment located within three (3) feet of the parking space. If EVSE is provided the minimum capacity of the EVSE shall be

30-ampere.

LOW POWER LEVEL 2 EV READY. A parking space that is served by a complete electric circuit with the following requirements:

i. A minimum of 4.1 kVA (208/240 Volt, 20-ampere) capacity wiring.
ii. A receptacle labeled “Electric Vehicle Outlet” or electric vehicle supply equipment located within three (3) feet of the parking space. If EVSE is provided the minimum capacity of the EVSE shall be 16-ampere.
iii. Conduit oversized to accommodate future Level 2 EV Ready (208/240 volt, 40- ampere) at each parking space.

LOW-RISE RESIDENTIAL BUILDING. For the purpose of *CALGreen*, any building that is of Occupancy Group R and is three stories or less.

MULTI-OCCUPANT SPACES. Indoor spaces used for presentations and training, including classrooms and conference rooms.

NEIGHBORHOOD ELECTRIC VEHICLE (NEV). A motor vehicle that meets the definition of "low-speed vehicle" either in Section 385.5 of the Vehicle Code or in 49 CFR571.500 (as it existed on July 1, 2000), and is certified to zero-emission vehicle standards.

NEWLY CONSTRUCTED (or NEW CONSTRUCTION). A newly constructed building (or new construction) does not include additions, alterations or repairs.

OFF-STREET LOADING SPACES. An area, other than a public street, public way or other property (and exclusive of off-street parking spaces), permanently reserved or set aside for the loading or unloading of motor vehicles, including ways of ingress and egress and maneuvering areas. Whenever the term "loading space" is used, it shall, unless the context clearly requires otherwise, be construed as meaning off-street loading space. This excludes designated passenger loading/unloading.

RESIDENTIAL BUILDING. See "LOW-RISE RESIDENTIAL BUILDING" or "HIGH-RISE RESIDENTIAL BUILDING."

SUBMETER. A secondary device beyond a meter that measures water consumption of an individual rental unit within a multiunit residential structure or mixed-use residential and commercial structure. (See Civil Code Section 1954.202(g) and Water Code Section 517 for additional details.)

VANPOOL VEHICLE. Eligible vehicles are limited to any motor vehicle, other than a motortruck or truck tractor, designed for carrying more than 10 but not more than 15 persons including the driver, which is maintained and used primarily for the nonprofit work-related transportation of adults for the purposes of ridesharing.

Note: Source: Vehicle Code, Division 1, Section 668.

ZEV. Any vehicle certified to zero-emission standards.

ZERO-EMITTING AND HIGH EFFICIENT VEHICLES. Eligible vehicles are limited to the following:

1. Zero emission vehicle (ZEV), enhanced advanced technology PZEV (enhanced AT ZEV) or transitional zero emission vehicles (TZEV) regulated under CCR, Title 13, Section 1962.

2. High-efficiency vehicles, regulated by US EPA, bearing a fuel economy and greenhouse gas rating of 9 or 10 as regulated under 40 CFR Section 600 Subpart D.

Chapter 3 Green Building

Section 304 Voluntary Tiers

304.1 Purpose

Voluntary tiers are intended to further encourage building practices that improve public health, safety and general welfare by promoting the use of building concepts which minimize the building's impact on the environment and promote a more sustainable design.

304.1.1 Tiers

The provisions of Divisions A4.6 and A5.6 outline means, in the form of voluntary tiers, for achieving enhanced construction levels by incorporating additional measures for residential and nonresidential new construction. Voluntary tiers may be adopted by local governments and, when adopted, enforced by local enforcing agencies. Buildings complying with tiers specified for each occupancy contain additional prerequisite and elective green building measures necessary to meet the threshold of each tier. See Section 101.7 of this code for procedures and requirements related to local amendments, additions or deletions, including changes to energy standards.

Where there are practical difficulties involved in complying with the threshold levels of a tier, the enforcing agency may grant modifications for individual cases. The enforcing agency shall first find that a special individual reason makes the strict letter of the tier impractical and that modification is in conformance with the intent and purpose of the measure. The details of any action granting modification shall be recorded and entered in the files of the enforcing agency.

304.1.2 Alternate Methods

As an alternative to achieving compliance with the Green Building Standards Code requirements, a project may instead achieve compliance through; (i) the United States Green Building Council’s Leadership in Energy and Environmental Design LEED), (ii) Build It Green’s Green Point Rating System; or (iii) another recognized and approved third party green building standards and rating system. Equivalency to the Green Building Standards Code shall be evaluated, detailed and certified by the design professional.

Chapter 4 Residential Mandatory Measures

Section 4.106 Site Development

This section includes only the CALGreen subsections relevant to electrification and EV charging standards, as amended by the City of Livermore. To view other CALGreen requirements, visit: [2022 CALGreen (iccsafe.org)]

4.106.4 Electric Vehicle (EV) Charging for New Construction

New construction shall comply with Section 4.106.4.1 or 4.106.4.2 to facilitate future installation and use of EV chargers. Electric vehicle supply equipment (EVSE) shall be installed in accordance with the *California Electrical Code*, Article 625. Signage for EVCS and EV Ready Spaces shall be identified by signage or pavement markings, in compliance with Caltrans Traffic Operations Policy Directive 13-01 (Zero Emission Vehicle Signs and Pavement Markings) or its successor(s).

Exception:

1. On a case-by-case basis, where the local enforcing agency has determined EV charging and infrastructure are not feasible based upon one or more of the following conditions:
    1.1. Where there is no local utility power supply or the local utility is unable to supply adequate power.
    1.2. Where there is evidence suitable to the local enforcing agency substantiating that additional local utility infrastructure design requirements, directly related to the implementation of Section 4.106.4, may increase construction cost by an average of $4500 per parking space for market rate housing or $400 per parking space for affordable housing. EV infrastructure shall be provided up to the level that would not exceed this cost for utility service.
2. Accessory Dwelling Units (ADU) and Junior Accessory Dwelling Units (JADU) without additional parking facilities.
3. Multifamily residential R-2 building projects that have approved entitlements before the code effective date.

4.106.4.1 New One- And Two-Family Dwellings and Town-Houses With Attached Private Garages

One parking space provided per unit shall be a Level 2 EV Ready space. If a second parking space is provided, it shall be provided with a Level 2 EV Ready space.

Exception: Accessory Dwelling Units with new parking facilities shall provide one Level 2 EV Capable space.

4.106.4.2 New Multifamily Dwellings and New Residential Parking Facilities

Fifteen percent (15%) of dwelling units with parking spaces shall be EVCS with Level 2 EV Ready. ALMS shall be permitted to reduce load when multiple vehicles are charging. Eighty-five percent (85%) of dwelling units with parking spaces shall be provided with a Low Power Level 2 EV Ready space. One DCFC may be substituted for up to five (5) EVCS to meet the requirements of 4.106.4.2.

EV Ready spaces and EVCS in multifamily developments shall comply with California Building Code, Chapter 11A, Section 1109A. EVCS shall comply with the accessibility provisions for EV chargers in the California Building Code, Chapter 11B.

4.106.4.2.1 Electric Vehicle Charging Stations (EVCS)

Electric vehicle charging stations required by Section 4.106.4.2 shall comply with Section 4.106.4.2.1.

Exception: Electric vehicle charging stations serving public accommodations, public housing, motels, and hotels shall not be required to comply with this section. See *California Building Code*, Chapter 11B, for applicable requirements.

4.106.4.2.1.1 Location

EVCS shall comply with at least one of the following options:

1. The charging space shall be located adjacent to an accessible parking space meeting the requirements of the *California Building Code*, Chapter 11A, to allow use of the EV charger from the accessible parking space.

2. The charging space shall be located on an accessible route, as defined in the *California Building Code*, Chapter 2, to the building.

   Exception: Electric vehicle charging stations designed and constructed in compliance with the *California Building Code*, Chapter 11B, are not required to comply with Section 4.106.4.2.1.1 and Section 4.106.4.2.1.2.

4.106.4.2.1.2 Dimensions

The charging spaces shall be designed to comply with the following:

1. The minimum length of each EV space shall be 18 feet (5486 mm).

2. The minimum width of each EV space shall be 9 feet (2743 mm).

3. One in every 25 charging spaces, but not less than one, shall also have an 8-foot (2438 mm) wide minimum aisle. A 5-foot (1524 mm) wide minimum aisle shall be permitted provided the minimum width of the EV space is 12 feet (3658 mm).

   a. Surface slope for this EV space and the aisle shall not exceed 1 unit vertical in 48 units horizontal (2.083 percent slope) in any direction.

Exception: Where the City's Municipal or Zoning Code permits parking space dimensions that are less than the minimum requirements stated in this section 4.106.4.2.1.2, and the compliance with which would be infeasible due to particular circumstances of a project, an exception may be granted while remaining in compliance with *California Building Code* Section Table 11B-228.3.2.1 and 11B-812, as applicable.

4.106.4.3 Electric Vehicle Charging for Additions and Alterations of Parking Facilities Serving Existing Multifamily Buildings

When new parking facilities are added, or electrical systems or lighting of existing parking facilities are added or altered and the work requires a building permit, ten (10) percent of the total number of parking spaces added or altered shall be electric vehicle charging spaces (EV spaces) capable of supporting future Level 2 EVSE.

Notes:

1. Construction documents are intended to demonstrate the project's capability and capacity for facilitating future EV charging.
2. There is no requirement for EV spaces to be constructed or available until EV chargers are installed for use.

4.106.5 All-electric Buildings.

New construction buildings shall comply with Section 4.106.5.1 or 4.106.5.2 so that they do not use *combustion equipment* or are ready to accommodate installation of *electric heating appliances*.

4.106.5.1 New Construction.

New Construction: All newly constructed buildings shall be *all-electric buildings*.

Building additions, alterations, repairs, and tenant improvements shall not be considered new construction. The final determination whether a project meets the definition of new construction shall be made by the local enforcing agency.

Exceptions:

1. Multifamily residential building projects that have approved entitlements before the effective date of this ordinance may install fuel gas for water heating systems serving multiple dwelling units. The applicant shall comply with Section 4.106.5.2.

2. Accessory Dwelling Units (ADUs) that are constructed on a lot with an existing residence that utilizes fuel gas.

3. If the applicant establishes that there is not an all-electric prescriptive compliance pathway for the building under the California Building Energy Efficiency Standards, and that the building is not able to achieve the performance compliance standard applicable to the building under the Energy Efficiency Standards using commercially available technology and

an approved calculation method, then the local enforcing agency may grant a modification. The applicant shall comply with Section 4.106.5.2.

4. Non-combustion fuel cells that convert natural gas, biogas, or hydrogen to electricity on-site.

Inactive *Fuel Gas Infrastructure* may be extended to spaces that are anticipated to qualify for the exceptions contained in this chapter. The inactive *Fuel Gas Infrastructure* shall not be activated, have a meter installed, or otherwise used unless the exemptions specified in this chapter have been confirmed as part of the issuance of a building permit. If the *Fuel Gas Infrastructure* is no longer serving one of the exceptions contained in this chapter, it shall either be capped, otherwise terminated, or removed by the entity previously entitled to the exemption, in a manner pursuant to all applicable Codes.

The local enforcing agency shall have the authority to approve alternative materials, design and methods of construction or equipment per California Building Code Section 104.

Section 4.106.5.2 Requirements for combustion equipment.

Where *combustion equipment* is allowed per Exceptions under 4.106.5.1, the construction drawings shall indicate electrical infrastructure and physical space accommodating the future installation of an *electrical heating appliance* in the following ways, as certified by a registered design professional or licensed electrical contractor:

1. Branch circuit wiring, electrically isolated and designed to serve all electrical heating appliances in accordance with manufacturer requirements and the California Electrical Code, including the appropriate voltage, phase, minimum amperage, and an electrical receptacle or junction box within five feet of the appliance that is accessible with no obstructions. Appropriately sized conduit may be installed in lieu of conductors; and

2. Labeling of both ends of the unused conductors or conduit shall be with "For Future Electrical Appliance"; and

3. Reserved circuit breakers in the electrical panel for each branch circuit, appropriately labeled (i.e "Reserved for Future Electric Range"), and positioned on the opposite end of the panel supply conductor connection; and

4. Connected subpanels, panelboards, switchboards, busbars, and transformers shall be sized to serve the future electrical heating appliances. The electrical capacity requirements shall be adjusted for demand factors in accordance with the California Electric Code; and

5. Physical space for future electrical heating appliances, including equipment footprint, and if needed a pathway reserved for routing of ductwork to heat pump evaporator(s), shall be depicted on the construction drawings. The footprint necessary for future electrical heating appliances may overlap with non-structural partitions and with the location of currently designed combustion equipment.

Chapter 5 Nonresidential Mandatory Measures

Section 5.106 Site Development

This section includes only the CALGreen subsections relevant to electrification and EV charging standards, as amended by the City of Livermore. To view other CALGreen requirements, visit: 2022 CALGreen (iccsafe.org)

5.106.5

5.106.5.3 Electric Vehicle (EV) Charging. Construction to provide electric vehicle infrastructure and facilitate electric vehicle charging shall comply with Section 5.106.5.3 and shall be provided in accordance with regulations in the *California Building Code* and the *California Electrical Code*. Accessible EVCS shall be provided in accordance with the *California Building Code Chapter 11B Section 11B-228.3*. For EVCS signs, refer to Caltrans Traffic Operations Policy Directive 13-01 (Zero Emission Vehicle Signs and Pavement Markings) or its successor(s).

Exceptions:

1. On a case-by-case basis where the local enforcing agency has determined compliance with this section is not feasible based upon one of the following conditions:
    a. Where there is no local utility power supply.
    b. Where the local utility is unable to supply adequate power.
    c. Where there is evidence suitable to the local enforcement agency substantiating that additional local utility infrastructure design requirements, directly related to the implementation of Section 5.106.5.3, may increase construction cost by an average of $400 per parking space for non-profit organizations serving low-income, vulnerable, and/or underserved communities or $4500 per parking space for others. EV infrastructure shall be provided up to the level that would not exceed this cost for utility service.
2. Parking spaces accessible only by automated mechanical car parking systems are not required to comply with this code section.

5.106.5.3.1 Nonresidential Occupancy Class B Offices, including mixed-class buildings that include Occupancy Class B Office space – Shared Parking Space.

New Construction. Twenty percent (20%) of parking spaces shall be EVCS with Level 2 EV Ready. ALMS shall be permitted to reduce load when multiple vehicles are charging. Thirty percent (30%) of parking spaces provided shall be Level 2 EV Capable.

5.106.5.3.2 Hotel and Motel Occupancies – Shared Parking Facilities.

New Construction. Five percent (5%) of parking spaces provided shall be EVCS with Level 2 EV Ready. ALMS shall be permitted to reduce load when multiple vehicles are charging. Twenty-five percent (25%) of parking spaces provided shall be Low Power Level 2 EV Ready space. Ten percent (10%) of parking spaces provided shall be Level 2 EV Capable.

5.106.5.3.3 All Other Nonresidential Occupancies – Shared Parking Facilities.

New Construction. Ten percent (10%) of parking spaces provided shall be EVCS with Level 2 EV Ready. ALMS shall be permitted to reduce load when multiple vehicles are charging. Ten percent (10%) of parking spaces provided shall be Level 2 EV Capable.

5.106.5.3.4 Direct current fast charging stations.

One DCFC may be substituted for up to five (5) EVCS to meet the requirements of 5.106.5.3.1, 5.106.5.3.2, and 5.106.5.3.3. Where ALMS serve DCFC stations, the power demand from the DCFC shall be prioritized above Level 1 and Level 2 spaces.

5.106.5.4 Electric Vehicle (EV) Charging: Medium-Duty and Heavy-Duty

[N] Construction shall comply with Section 5.106.5.4.1 to facilitate future installation of electric vehicle supply equipment (EVSE). Construction for warehouses, grocery stores and retail stores with planned off-street loading spaces shall also comply with Section 5.106.5.4.1 for future installation of medium- and heavy-duty EVSE.

Exceptions:

1. On a case-by-case basis where the local enforcing agency has determined compliance with this section is not feasible based upon one of the following conditions:
    a. Where there is no local utility power supply.
    b. Where the local utility is unable to supply adequate power.
    c. Where there is evidence suitable to the local enforcing agency substantiating that additional local utility infrastructure design requirements, directly related to the implementation of Section 5.106.5.3, may adversely impact the construction cost of the project.

When EVSE(s) is/are installed, it shall be in accordance with the *California Building Code*, the *California Electrical Code* and as follows:

5.106.5.4.1 Electric Vehicle Charging Readiness Requirements for Warehouses, Grocery Stores and Retail Stores With Planned Off-Street Loading Spaces

[N] In order to avoid future demolition when adding EV supply and distribution equipment, spare raceway(s) or busway(s) and adequate capacity for transformer(s), service panel(s) or subpanel(s) shall be installed at the time of construction in accordance with the *California Electrical Code*. Construction plans and specifications shall include, but are not limited to, the following:

1. The transformer, main service equipment and subpanels shall meet the minimum power requirement in Table 5.106.5.4.1 to accommodate the dedicated branch circuits for the future installation of EVSE.

2. The construction documents shall indicate one or more location(s) convenient to the planned offstreet loading space(s) reserved for medium- and heavy-duty ZEV charging cabinets and charging dispensers, and a pathway reserved for routing of conduit from the termination of the raceway(s) or busway(s) to the charging cabinet(s) and dispenser(s), as shown in Table 5.106.5.4.1.
3. Raceway(s) or busway(s) originating at a main service panel or a subpanel(s) serving the area where potential future medium- and heavy-duty EVSE will be located and shall terminate in close proximity to the potential future location of the charging equipment for medium- and heavy-duty vehicles.
4. The raceway(s) or busway(s) shall be of sufficient size to carry the minimum additional system load to the future location of the charging for medium- and heavy-duty ZEVs as shown in Table 5.106.5.4.1.

TABLE 5.106.5.4.1

RACEWAY CONDUIT AND PANEL POWER REQUIREMENTS FOR MEDIUM- AND HEAVY-DUTY EVSE [N]

BUILDING TYPE	**BUILDING SIZE (SQ. FT.)**	**NUMBER OF OFF-STREET LOADING SPACES**	**ADDITIONAL CAPACITY REQUIRED (KVA) FOR RACEWAY & BUSWAY AND TRANSFORMER & PANEL**
Grocery	10,000 to 90,000	1 or 2	200
		3 or Greater	400
	Greater than 90,000	1 or Greater	400
Retail	10,000 to 135,000	1 or 2	200
		3 or Greater	400
	Greater than 135,000	1 or Greater	400
Warehouse	20,000 to 256,000	1 or 2	200
		3 or Greater	400
	Greater than 256,000	1 or Greater	400

5.106.13 All-electric buildings.

New construction buildings shall comply with Section 5.106.13.1 or 5.106.13.2 so that they do not use *combustion equipment* or are ready to facilitate future electrification.

5.106.13.1. New construction.

New construction: All newly constructed buildings shall be *all-electric buildings*.

Building additions, alterations, repairs, and tenant improvements shall not be considered new construction. The final determination whether a project meets the definition of new construction shall be made by the local enforcing agency.

Exceptions:

1. Nonresidential buildings containing kitchens located in a place of public accommodation, as defined in the California Building Code Chapter 2, may apply to the local enforcing agency for a modification to install *commercial food heat-processing equipment* served by *fuel gas*. The local enforcing agency may grant the modification if they find:
    a. A business-related need to cook with *combustion equipment*; and
    b. The need cannot be achieved equivalently with an *electric heating appliance*; and
    c. The applicant has installed energy efficient equipment based on Energy Star or California Energy Wise qualifications, as available.
    d. The applicant shall comply with Section 5.106.13.2.

2. Laboratories, as defined in the California Building Code Chapter 2, may apply to the local enforcing agency for a modification to install *combustion equipment* served by *fuel gas.* The local enforcing agency may grant the modification if they find:
    e. A business, research, or educational-related need to use *combustion equipment*; and
    f. The need cannot be achieved equivalently with an *electric heating appliance*; and
    g. The applicant has installed energy efficient equipment based on Energy Star or California Energy Wise qualifications, as available.
    h. The applicant shall comply with Section 5.106.13.2.

3. Hotels and motels with eighty or more guestrooms may utilize *fuel gas* in on-site commercial clothes drying equipment. The applicant shall comply with Section 5.106.13.2.

4. If the applicant establishes that there is not an all-electric prescriptive compliance pathway for the building under the California Building Energy Efficiency Standards, and that the building is not able to achieve the performance compliance standard applicable to the building under the Energy Efficiency Standards using commercially available technology and an approved calculation method, then the local enforcing agency may grant a modification. The applicant shall comply with Section 5.106.13.2

5. Non-combustion fuel cells that convert natural gas, biogas, or hydrogen to electricity on-site.

Inactive *Fuel Gas Infrastructure* may be extended to spaces that are anticipated to qualify for the exceptions contained in this chapter. The inactive *Fuel Gas Infrastructure* shall not be activated, have a meter installed, or otherwise used unless the exemptions specified in this chapter have been confirmed as part of the issuance of a building permit. If the *Fuel Gas Infrastructure* is no longer serving one of the exceptions contained in this chapter, it shall either be capped, otherwise terminated, or removed by the entity previously entitled to the exemption, in a manner pursuant to all applicable Codes.

The local enforcing agency shall have the authority to approve alternative materials, design and methods of construction or equipment per California Building Code Section 104.

Section 5.106.13.2. Requirements for combustion equipment.

Where *combustion equipment* is allowed per exceptions under Section 5.106.13.1, the construction drawings shall indicate electrical infrastructure and physical space accommodating the future installation of an *electrical heating appliance* in the following ways, as certified by a registered design professional or licensed electrical contractor:

1. Branch circuit wiring, electrically isolated and designed to serve all electrical heating appliances in accordance with manufacturer requirements and the California Electrical Code, including the appropriate voltage, phase, minimum amperage, and an electrical receptacle or junction box within five feet of the appliance that is accessible with no obstructions. Appropriately sized conduit may be installed in lieu of conductors; and
2. Labeling of both ends of the unused conductors or conduit shall be with "For Future Electrical Appliance"; and
3. Reserved circuit breakers in the electrical panel for each branch circuit, appropriately labeled (i.e "Reserved for Future Electric Range"), and positioned on the opposite end of the panel supply conductor connection; and
4. Connected subpanels, panelboards, switchboards, busbars, and transformers shall be sized to serve the future electrical heating appliances. The electrical capacity requirements shall be adjusted for demand factors in accordance with the California Electric Code; and
5. Physical space for future electrical heating appliances, including equipment footprint, and if needed a pathway reserved for routing of ductwork to heat pump evaporator(s), shall be depicted on the construction drawings. The footprint necessary for future electrical heating appliances may overlap with non-structural partitions and with the location of currently designed combustion equipment.