

**Meeting of the
COMMITTEE ON
ENERGY AND THE ENVIRONMENT
AGENDA**

September 28, 2022 – 5:00 P.M.

On March 3, 2020, Governor Newsom proclaimed a State of Emergency due to COVID-19 and has issued Executive Order N-29-20, and approved AB 361 suspending provisions of the Brown Act allowing meetings via teleconferencing and members of the public to observe and offer comments telephonically or electronically.

If you wish to speak on an item listed on this agenda or under public comment, it is requested that you submit a speaker card in advance of the meeting at <https://forms.cityofpleasantonca.gov/f/Sept282022>

Once the meeting begins, you may participate in the Zoom meeting by using the “raise your hand” function when public comment is opened on the agenda item. You will be unmuted when your name is called and you will be re-muted after the allotted time. To raise your hand, click the “raise your hand” button or *9 on your telephone. To unmute your phone, press *6.

Join the meeting using this URL <https://cityofpleasanton.zoom.us/j/85167903367>

CALL TO ORDER

ROLL CALL

AGENDA AMENDMENTS

MINUTES

1. Approve the regular meeting minutes of September 7, 2022.

MEETING OPEN TO THE PUBLIC

2. Public comment from members of the audience regarding items not listed on the agenda.

OTHER MATTERS BEFORE THE COMMITTEE

3. Reach Codes for Electric Vehicle Charging Infrastructure and Building Electrification

MATTERS INITIATED BY COMMITTEE MEMBERS: Brief reports on conferences, seminars, and meetings attended by Committee members.

ADJOURNMENT

The next meeting is a Regular Meeting of the Committee on Energy and the Environment on November 16, 2022, at 5:00 p.m.

Accessible Public Meetings

The City of Pleasanton can provide special assistance for persons with disabilities to participate in public meetings. To make a request for a disability-related modification or accommodation (e.g., an assistive listening device), please contact the City Clerk’s Office at 123 Main Street, Pleasanton, CA 94566 or (925) 931-5027 at the earliest possible time. If you need sign language assistance, please provide at least two working days’ notice prior to the meeting date.

**MINUTES
CITY OF PLEASANTON
SPECIAL MEETING OF THE COMMITTEE ON ENERGY AND THE ENVIRONMENT
September 7, 2022**

CALL TO ORDER

Chair Liu called a teleconference meeting of the Committee on Energy and the Environment to order at the hour of 5:02 p.m.

ROLL CALL

Committee Members Present: Brown, Bloom, Jain, Kelly, Lee, and Chair Liu
Committee Members Absent: Klein

AGENDA AMENDMENTS

MINUTES

1. Approve the meeting minutes of the March 23, 2022, meeting.
Motion by: Lee Seconded by: Brown
Ayes: Brown, Bloom Jain, Kelly, Lee, and Liu
Noes: none

Motion passed unanimously.

MEETING OPEN TO THE PUBLIC

2. Public Comment from members of the audience regarding items not listed on the agenda:

None.

OTHER MATTERS BEFORE THE COMMITTEE

3. Climate Action Plan 2.0 Status Report and Upcoming Committee Review Items

Megan Cambell, Planner for the City of Pleasanton presented a status update of the Climate Action Plan 2.0, including the status of implementing some of the action items, and discussed a modeling adjustment to the CAP.

Committee members expressed appreciation for the work that has been accomplished toward the CAP goals so far.

Public Comment: None.

MATTERS INITIATED BY COMMITTEE MEMBERS.

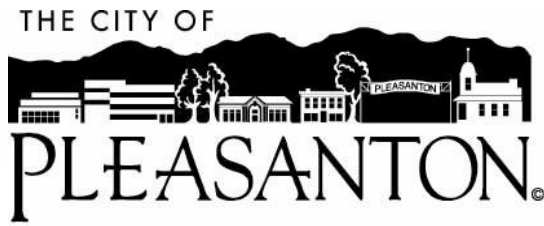
Future meeting water utility update as it related to CAP 2.0

ADJOURNMENT

The meeting was adjourned at 5:46 p.m.

Next regular meeting of the Committee is scheduled for September 28, 2022 at 5pm.

Respectfully Submitted,
ZeeLaura Page



The Committee on Energy and the Environment Agenda Report

September 28, 2022

Item 3

**SUBJECT: REACH CODES FOR ELECTRIC VEHICLE CHARGING
INFRASTRUCTURE AND BUILDING ELECTRIFICATION**

EXECUTIVE SUMMARY

Every three years the State of California adopts new building standards that make up the California Building Code of Regulations, Title 24. The prior Building Code was adopted in 2019 and the 2022 California Building Code update will become effective on January 1, 2023. For certain topics, including around energy efficiency and provisions aimed at reducing GHG emissions, cities can adopt local “reach codes” that set requirements above the minimums of the State Code. Consistent with the City’s Climate Action Plan 2.0 (CAP 2.0), this report outlines suggested reach codes related to required electric vehicle (EV) charging infrastructure and building electrification for new construction, which are proposed to be brought forward to the City Council for consideration and adoption this fall.

RECOMMENDATION

Staff recommends reach codes related to required EV charging infrastructure and building electrification for new construction. Staff seeks the Committee on Energy and Environment recommendation to the City Council on the suggested reach codes.

BACKGROUND

Climate Action Plan 2.0

The City's adopted CAP 2.0 outlines greenhouse gas (GHG) emissions in the City. Pleasanton's largest source of emissions comes from transportation, comprising 64-percent of all emissions; followed by natural gas use in buildings comprising 20-percent of all emissions. The CAP 2.0 includes 16 primary actions and 9 secondary actions intended to improve community resilience and reduce GHG emissions by 70% per capita by 2030.

The CAP 2.0 includes two relevant primary actions as follows:

- **Primary Action 1: Reach Codes**
 - This action indicates that the City will adopt an all-electric building reach code for new construction that limits the development of new gas infrastructure (indicating that exceptions can be considered).
- **Primary Action 5: Zero Emission Vehicle Infrastructure Plan**
 - This action includes several elements, one of which is that new construction (specifically housing) will be required to install EV charging capabilities.

Reach Code Adoption Process

Every three years the State of California adopts new building standards that make up the California Building Code of Regulations, Title 24. All occupancies (e.g., various types of residential and non-residential uses) in California are subject to Title 24, and occupancies may be further subject to amendments adopted by state agencies and ordinances implemented by local jurisdictions' governing bodies. The 2022 California Building Code updates will become effective on January 1, 2023. For certain topics, including around energy efficiency and provisions aimed at reducing GHG emissions, cities can adopt local reach codes that set requirements above the minimums of the state code. The state prescribes certain procedures that must be followed when adopting local amendments.

If local amendments require energy efficiency or conservation measures, such as a higher performance building envelope, the California Energy Commission (CEC) requires that the amendments be supported by a cost-effectiveness study and filed as amendments to the Energy Code (Title 24, Part 6). A cost-effectiveness study and filing with the CEC is not required for amendments that do not require energy efficiency or conservation, such as only requiring building electrification. Such amendments can be made to the California Green Building Standards Code (Title 24, Part 11, also known as CALGreen). However, a cost-effectiveness study can demonstrate that amendments to the code are financially responsible and do not represent an unreasonable burden to the residential and nonresidential building owners and occupants.

Bay Area Reach Codes

Over the past seven months, a group of public agencies including East Bay Community Energy (EBCE), Peninsula Clean Energy, Silicon Valley Clean Energy, the San Mateo County Office of Sustainability, the County of Santa Clara, and StopWaste developed a set of resources to assist cities with development of local Building Electrification and EV Infrastructure Reach Codes. The group developed model reach code templates that can be used by its member cities.

For Pleasanton, staff proposes to use the model reach codes as a template for much of the proposed local amendment - however, some adjustments are suggested to better align with Pleasanton's goals. In recent years, over 50 cities in the Bay Area have adopted some form of reach code (i.e., building electrification and/or EV charging) for the current (2019) code cycle – locally these include Contra Costa County, Fremont, San Carlos, Los Altos, Alameda, and Emeryville. In addition to Pleasanton, several additional cities are considering reach codes this code cycle including Dublin, Livermore, Walnut Creek, and Hayward.

DISCUSSION

Building Electrification

Overview

The 2022 California Energy Code (Part 6) within Title 24 is more strongly oriented towards an all-electric preferred model¹ than prior code cycles but continues to allow for mixed-fuel buildings. Staff recommends the City adopt a reach code through Part 11 (CALGreen) that would require newly constructed buildings to be built all-electric. Such buildings would have no gas infrastructure installed, and electricity would be the sole source of energy for all space heating, water heating, cooking, and clothes drying appliances.

While the reach code would generally require new building electrification, staff recommends some limited exceptions as follows:

- Multi-family residential buildings that have been granted entitlements the year prior to ordinance adoption.
- Commercial kitchens with a business-related need to cook with combustion equipment.
- Industrial processes for labs, research, or educational related needs.
- 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.

Staff notes that existing properties with gas infrastructure can maintain the existing infrastructure, and most additions to these properties could continue to include gas. Additionally, alterations to existing properties with gas (e.g., partial demolition and rebuild of an existing home) can continue include gas if the alteration is less than 50-percent of the total existing building size. Further, any new construction (i.e., new buildings) on the property would need to be constructed all-electric. The redlines to Part 11, Title 24 for building electrification are included as Attachment 1.

This recommendation will implement Primary Action 1 from the CAP 2.0. Coupled with Existing Actions 1 and 2 (i.e., maintaining zero-emissions energy as the default energy choice for both the City and community), all-electric new construction would result in homes and businesses that do not emit GHGs from energy use. The GHG emissions

¹ Examples of such requirements include improved TDV (time dependent valuation) performance, pre-wiring for gas appliances, and higher ventilation rates for gas stoves.

reduction potential from adopting an all-electric reach code is estimated to be 10,100 metric tons (MT) carbon dioxide equivalent (CO₂e) through 2030.

Additional Considerations

In addition to implementing CAP 2.0 Primary Action 1 and reducing GHG reductions over time, requiring all-electric construction has several other factors to consider:

- *Cost*
All-electric buildings are typically less expensive to build and operate than their mixed-fuel counterparts. Cost savings are achieved from not having to run gas lines, having to install fewer appliances, and the time savings of avoided inspections and sign-off of gas meters by Pacific Gas & Electric (PG&E). Funded by the California investor-owned utilities (IOUs), the California Statewide Codes and Standards Program (Statewide Program) led the development of cost-effectiveness studies for reach codes that examined different performance-based approaches for new construction of specific building types. Staff has worked closely with EBCE's consultants to interpret the Statewide Program study's results, and to infer what options may or may not be cost-effective for the building types prevalent in Pleasanton. Through these discussions, staff has adjusted the proposed building electrification reach code and proposed exceptions.

Cost effectiveness is defined as having a positive cost/benefit ratio over the lifetime of the project either based on on-bill financing (the savings on utility bills over 15-30 years has a net present value greater than the cost of the upgrades) or time dependent valuation, which is a more detailed analysis which includes future costs of energy, cost of energy at different times of the day, and replacement costs of the equipment. The proposed reach codes for buildings in Pleasanton's Climate Zone (12), allow for all-electric construction pathways that are cost-effective over the lifetime of the building systems for most new construction buildings within city limits. For instances where a cost-effective compliant pathway does not exist, staff proposes an exception to the reach code and from constructing all-electric.

In addition to being cost-effective, for many building types, all-electric buildings are cost equivalent and less expensive to construct (e.g., single-family, retail, small office). As an example, cost savings for a new single-family home ranges from \$5,000-6,000 in upfront costs (primarily from avoiding constructing a new gas lateral). Additionally, annual cost savings are approximately \$400.

The 2022 single-family cost effectiveness study is linked as Attachment 3 for reference. The 2022 multi-family and non-residential studies will be released later this year, though the findings for the 2022 single-family study and past analysis for multi-family and non-residential in 2019 are indicative of what the studies will yield. As noted, for those building types that are not cost-effective- there is an exception suggested.

- *Construction Trends*

Construction has been trending toward increased electrification over the past 20 years and natural gas use has been decreasing. These trends can be attributed to several factors but represents availability of electric technologies and interest in electrification. Staff does offer a few exceptions where all electric development trends may lag due to industry preferences or technical feasibility. For example, induction cooking is fast heating, precise, keeps kitchens cooler, is more energy efficient, and considered safer than the other options. However, gas is still industry preferred with induction becoming increasingly popular and likely to overtake gas in the coming few years. Typically, cities that adopt all-electric reach codes start off with some exceptions (as recommended by staff) and over time cities reduce the available exceptions (e.g., in the next Code cycle there may not be an exception for commercial kitchens as industry trends catch up).

- *Indoor Air Quality and Safety*
Health conditions can be aggravated by air pollutants like NO₂ that come from gas use in buildings (e.g., a gas stove). Electrifying buildings reduces indoor pollutant exposure and improves indoor air quality. Additionally, gas appliances can result in gas leaks or incomplete combustion that expose individuals to dangerous and potentially fatal levels of carbon monoxide. Carbon monoxide poisoning is not a risk with electric appliances.
- *Neighboring Jurisdictions*
Several jurisdictions throughout California are adopting electrification ordinances and/or reach codes through their Building Codes. This cycle, the cities of Livermore and Dublin (along with several other cities) are also considering requiring all-electric new construction requirements. Pleasanton's proposed regulations would be on par with those under consideration by our neighboring cities.
- *Resilience and Conservation*
This cycle, Title 24 requires solar panels and back-up battery storage for most new construction. This requirement coupled with requiring electrification will create additional energy conservation and decrease overall energy use. It also enhances resilience wherein these buildings can rely on the solar and battery backups in instances of grid stress and/or power safety shutoffs.

Electric Vehicle Charging

Overview

Given the significant contribution of transportation-related emissions to the overall GHG inventory, a fundamental shift in the types of cars driven by Californians, and the fuel they use, is necessary to meet California's health-based air quality standards and greenhouse gas emission reduction goals. Recognizing this, Governor Newsom's recent Executive Order N-79-20, realized through the State of California Air Resource Board (CARB)'s Advanced Clean Cars II rule, establishes that 100-percent of new cars and light trucks sold in the state will be zero-emissions vehicles by 2035.

Increasing access to reliable electric vehicle charging stations at home and at work is key to increasing EV adoption. Lack of access to EV charging infrastructure at home, and

particular at multi-family dwellings, is a major hurdle to EV ownership. As such, 2022 CALGreen (Part 11) within Title 24 outlines requirements for electric vehicle charging.

There are three main levels of charging:

- **Level 1:** 120V, charge time 3-5 miles per hour
- **Level 2:** 240V, charge time 12-40 miles per hour²
- **Level 3:** 480V, 150+ miles per charging hour (typically, an EV can get 80% full charge in 20 minutes)

Additionally, there are three main types of EV charging readiness as follows:

- **EV Capable:** Panel capacity and conduit installed to support future build-out of EV charging
- **EV Ready:** The full circuit is installed including the conduit, wiring, and receptacle
- **EV Charging Station (EVCS):** EV Ready, plus the actual charging station required to charge is installed

Staff recommends the City adopt a reach code to require additional EV charging infrastructure as follows. Proposed reach code requirements for single-family residential, multi-family residential/hotel, and non-residential land uses are outlined in Tables 1 through 3, below. In each table, a comparison is provided to the 2022 California Building Code “Base Code”. The redlines to Part 11, Title 24 for electric vehicle charging are included as Attachment 2.

Table 1: Single-Family Residential

	2022 Base Code	Proposed Code
EV Capable	One (1) Level 2	
EV Ready	-	Two (2) Level 2 (if parking is provided)
EVCS		

² Level 2 typically includes a 40-amp circuit whereas low power level 1 is a 20-amp circuit

Table 2: Multi-Family Residential/Hotel and Motel

	2022 Base Code ³ <20 Units	2022 Base Code 20+ Units	Proposed Code ⁴	
			MFR	Hotel
EV Capable	10% Level 2	10% Level 2		10% Level 2
EV Ready	25% Level 2 (low power)	25% Level 2 (low power)	85% Level 2 (low power)	25% Level 2 (low power)
EVCS	-	5% Level 2	15% Level 2	5% Level 2

Table 3: Non-Residential

	2022 Base Code ⁵⁶	Proposed Code	
		Office	All Other
EV Capable	15% Level 2	30% Level 2	10% Level 2
EV Ready	-	-	-
EVCS	5% Level 2	20% Level 2	10% Level 2

This recommendation will implement part of Primary Action 5 from the CAP 2.0. The action includes many components, including requiring installation electric vehicle charging for new construction (specifically housing). The GHG emissions reduction potential for the entirety of Primary Action 5 is estimated to be 315,300 MT CO2e through 2030. Reach codes are important to achieve the action’s GHG mitigating potential.

Additional Considerations

In addition to implementing part of CAP 2.0 Primary Action 5 and reducing GHG reductions over time, requiring EV charging infrastructure installation has several other factors to consider:

- **Cost**
To evaluate the financial impact on costs, EBCE commissioned an analysis of the total cost of implementing various EV infrastructure measures. Installing EV charging infrastructure for a new project that was otherwise not planning to install infrastructure above the Base Code, is more expensive. The cost increase for single-family residential is less than \$1,000 above the Base Code total construction cost. For both a 100-unit multi-family building and office building with 50 parking spaces, the cost increase for the proposed code is estimated to be ~0.18-percent above the Base Code total construction cost. For other commercial uses with 50

³ The Base Code applies to the percent of total parking spaces. The proposed code applies to the percent of dwelling units with parking spaces.

⁴ Automatic load management (ALMS) is encouraged in the proposed code. ALMS manages the load across one or more charger to share capacity

⁵ The 2022 Base Code requirements are based on number of parking spaces in the parking lot. For Base code capable, it ranges from 0 required spaces up to 40% capable depending on quantity of spaces- averaging around 20%. For Base Code EVCS, it ranges from 0-8% installed- averaging around 5%. Additionally, the Base Code does not distinguish between office and other commercial uses.

⁶ The Base Code requires 20% capable (5% of which must be installed). As such, staff has modified the percentages noted here to reflect the credit.

parking spaces, the cost increase for the proposed code is estimated to be ~0.01-percent above the Base Code total construction cost.

While more expensive, the cost is shown to be less than a percent of the total project cost for the examples noted. Staff finds this is a reasonable increase to total project cost.

It is also worth noting that it is significantly more expensive to install charging infrastructure as a retrofit than it is during new construction. In 2019, the California Air Resources Board found that adding an EV capable spot during nonresidential new construction projects costs between \$870 to \$960 per space, as opposed to \$7,000 to \$8,000 per parking space when retrofitting existing sites. As such, ensuring that newly constructed residential and non-residential parking has ample EV charging capability will reduce long-term retrofit costs of EV infrastructure installation.

While the Base Code's new minimum requirements are a step forward, it is unlikely that the requirements for multi-family dwellings and non-residential buildings are enough to keep pace with expected EV growth looking towards 2035. The proposed reach codes aim to increase the amount of EV infrastructure in new construction, while keeping construction costs as low as possible.

- *Vehicle Trends*

Residents are showing a significant interest in electric vehicles. The number of registered plug-in vehicles in San Mateo, Santa Clara, and Alameda counties increased 30-percent from October 2018 to January 2020. In that same time frame, the total number of registered vehicles in these counties *shrank* by 0.2-percent. In California, 12.5-percent of personal new vehicles purchased was an EV in 2021. It is widely known that availability of EV charging infrastructure is a critical component to EV adoption.

- *Neighboring Jurisdictions*

Several jurisdictions throughout California are adopting EV charging ordinances and/or reach codes through their Building Codes. This cycle, the cities of Livermore and Dublin (along with several other City's) are also considering requiring EV charging requirements above the required Code. Pleasanton's proposed regulations would be on par with those under consideration by our neighboring cities.

- *Resilience and Preparation*

Shifting away from traditional gasoline cars, reduces our reliance on fossil fuels which are a limited resource. Further, with the State requiring a shift to zero emissions vehicles, that transition will be challenging without the necessary infrastructure. The burden will be particularly of concern for residents living in multi-family dwellings. These reach codes allow new construction to better prepare for the transition to zero emissions vehicles.

PUBLIC OUTREACH

The CAP 2.0 included policy direction to require reach codes for building electrification and EV infrastructure. The public outreach process for the CAP 2.0 was over the course of two years and over 20 public meetings. The general policies were discussed, leaving the nuance to the actual implementation of the actions (e.g., quantity of chargers to require). There were high levels of support for both building and vehicle electrification and the suggested reach codes. There was particular support to require new construction to electrify. During the CAP 2.0 outreach, there was concern requiring existing residences to convert to all-electric. Staff carefully considered the input during the CAP 2.0 process when developing the reach codes. As noted in the report above, existing residences may continue to construct additions with gas and new gas lines for things like firepits. However, if new buildings are constructed, as outlined, they would be required to be all electric. Also, in the instance of major demolition (i.e., over 50-percent of the existing home), it would be considered “new construction”.

Ahead of this public hearing, Staff held a Community Meeting on September 13, 2022, via Zoom. Staff conducted outreach with the climate action mailing list (sent to over 200 recipients), local developers mailing list (over 100 recipients), posted meeting information to the City website, and included information in the Community Newsletter. The Community Meeting had minimal attendance. There were questions about the level of charging required (e.g., why Level 2 vs Level 3 fast charging). There were some comments about installation of chargers and considering length of cords, location of spaces, and continued maintenance of chargers. There were also questions about examples when electrification would be required.

ALTERNATIVES

The Committee on Energy and Environment can consider alternatives to proposed code suggested by staff. Alternatives include:

Building Electrification

1. Recommend the CA Building Codes without adopting a local amendment to require building electrification.
2. Revise the recommended reach code (e.g., remove exceptions or add in other exceptions).

Electric Vehicle Charging

1. Recommend the CA Building Codes without adopting a local amendment to require additional EV chargers.
2. Revise the recommended reach code (e.g., increase or decrease the number of required chargers).

COMMITTEE REVIEW AND ACTION

Staff requests the Committee review the proposed reach codes and provide a recommendation for City Council's consideration. Staff recommends reach codes related to required EV charging infrastructure and building electrification for new construction.

Submitted by:



Megan Campbell
Associate Planner

Approved by:



Becky Hopkins
Assistant to the City Manager

Attachments

1. Redlines to Part 11, Title 24 for Building Electrification
2. Redlines to Part 11, Title 24 for Electric Vehicle Charging
3. [2022 Single-Family Residential Cost Effectiveness Study](#) (hyperlink only)

2022 All-Electric Part 11 Reach Code

Part 11 – California Green Building Standards Code (CALGreen)

CHAPTER 2 – DEFINITIONS

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

ALL-ELECTRIC BUILDING. A building that contains no *combustion equipment* or plumbing for combustion equipment serving space heating (including fireplaces), water heating (including pools and spas), cooking appliances (including barbecues), and clothes drying, within the building or building 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.

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.

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.

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

INDUSTRIAL PROCESS HEAT. A process or manufacturing equipment for which sustained temperatures typically in excess of three hundred fifty degrees Fahrenheit are required and demonstrably not achievable with commercial electric equipment.

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

CHAPTER 4 – RESIDENTIAL MANDATORY MEASURES

Division 4.1 PLANNING AND DESIGN

SECTION 4.106 SITE DEVELOPMENT

4.106.5 All-electric buildings

4.106.5 All-electric buildings. New construction buildings and qualifying alteration projects 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 and qualifying alteration projects. All newly constructed buildings shall be *all-electric buildings*. Alterations that include replacement of over 50 percent of the existing foundation for purposes other than a repair or reinforcement as defined in California Existing Building Code Section 202; or where over 50 percent of the existing framing above the sill plate is removed or replaced for purposes other than repair, shall be *all-electric buildings*. If either of these criteria are met within a three-year period, measured from the date of the most recent previously obtained permit final date, the project shall be subject to the *all-electric buildings* requirements.

The final determination whether a project meets the definition of substantial reconstruction/alteration 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. 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.

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.

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

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

Division 5.1 PLANNING AND DESIGN

SECTION 5.106 - SITE DEVELOPMENT

5.106.13 All-electric buildings.

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5.106.13.1. New construction and qualifying alteration projects:

5.106.13 All-electric buildings. New construction buildings and qualifying alteration projects 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 and qualifying alteration projects. All newly constructed buildings shall be *all-electric buildings*. Alterations that include replacement of over 50 percent of the existing foundation for purposes other than a repair or reinforcement as defined in California Existing Building Code Section 202; or where over 50 percent of the existing framing above the sill plate is removed or replaced for purposes other than repair, shall be *all-electric buildings*. If either of these criteria are met within a three-year period, measured from the date of the most recent previously obtained permit final date, the project shall be subject to the *all-electric buildings* requirements.

Tenant improvements shall not be considered new construction. The final determination whether a project meets the definition of substantial reconstruction/alteration 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. Nonresidential buildings requiring industrial process heat, as defined in the California Building Code Chapter 2, may apply to the local enforcing agency for a modification to utilize *fuel gas infrastructure* for equipment requiring *industrial process heat*. The local enforcing agency may grant the modification if they find:
 - a. A business-related need to use industrial process heat; and
 - b. The need cannot be achieved equivalently with an *electric heating*.

- c. The applicant shall comply with Section 5.106.13.2.
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 5.106.13.2

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.

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

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.

DRAFT

2022 EV Charging Part 11 Reach Code

Part 11 – California Green Building Standards Code (CALGreen)

CHAPTER 2 – DEFINITIONS

...

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.

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.

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 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 (EV) READY SPACE. [HCD] A vehicle space which is provided with a branch circuit; any necessary raceways, both underground and/or surface mounted; to accommodate EV charging, terminating in a receptacle or a charger.

ELECTRIC VEHICLE (EV) CAPABLE SPACE. A vehicle space with electrical panel space and load capacity to support a branch circuit and necessary raceways, both underground and/or surface mounted, to support EV charging.

ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE). The electric vehicle charging 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.

LEVEL 2 ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE). ~~[HCD] The 208/240 Volt 40-ampere branch circuit, and the electric vehicle charging 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.~~

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 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 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 POWER LEVEL 2 ELECTRIC VEHICLE (EV) CHARGING RECEPTACLE. [HCD]** A 208/240 Volt 20-ampere minimum branch circuit and a receptacle for use by an EV driver to charge their electric vehicle or hybrid electric vehicle.~~

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.

CHAPTER 3- Green Building

SECTION 301 GENERAL

301.1 Scope. ... (No change to existing California amendment.)

301.1.1 Additions and alterations. [HCD] The mandatory provisions of Chapter 4 shall be applied to additions or alterations of existing residential buildings where the addition or alteration increases the building's conditioned area, volume, or size. The requirements shall apply only to and/or within the specific area of the addition or alteration. (No change to existing California amendment.)

The mandatory provisions of Section 4.106.4.2 may apply to additions or alterations of existing parking facilities or the addition of new parking facilities serving existing multifamily buildings. See Section 4.106.4.2.3 for application.

The mandatory provisions of Section 5.106.5.3 may apply to additions or alterations of existing parking facilities or the addition of new parking facilities serving existing nonresidential buildings.

NOTE: Repairs including, but not limited to, resurfacing, restriping, and repairing or maintaining

existing lighting fixtures are not considered alterations for the purpose of this section.

CHAPTER 4 – Residential Mandatory Measures

DIVISION 4.1, PLANNING AND DESIGN

SECTION 4.106 SITE DEVELOPMENT

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, and 4.106.4.3, 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. 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 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 adversely impact the construction cost of the project.
2. Accessory Dwelling Units (ADU) and Junior Accessory Dwelling Units (JADU) without additional parking facilities and without electrical panel upgrade or new panel installation. ADUs and JADUs without additional parking but with electrical panel upgrades or new panels must have reserved breakers and electrical capacity according to the requirements of 4.106.4.1.
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.

4.106.4.1.1 New Construction. Two parking space(s), if provided, shall be Level 2 EV Ready space. For each dwelling unit, install a listed raceway to accommodate a dedicated 208-240-volt branch circuit. The raceway shall not be less than trade size 1 (nominal 1-inch inside diameter). The race shall originate at a main service or subpanel and shall terminate into a listed cabinet, box or other enclosure in close proximity to the proposed location of an EV charger. Raceways are required to be continuous at enclosed, inaccessible or concealed areas and spaces. The service panel and/or subpanel shall provide capacity to install a 40-ampere 208/240-volt minimum dedicated branch circuit and space(s) reserved to permit installation of a branch circuit overcurrent

protective device.

~~— **Exception:** A raceway is not required if a minimum 40-ampere 208/240-volt dedicated EV branch circuit is installed in close proximity to the proposed location of an EV charger at the time of original construction in accordance with the *California Electrical Code*.~~

~~**4.106.4.1.1 Identification.** The service panel or subpanel circuit directory shall identify the overcurrent protective device space(s) reserved for future EV charging as “EV CAPABLE”. The raceway termination location shall be permanently and visibly marked as “EV CAPABLE”.~~

~~**4.106.4.1.2. Existing Building.** Electrical panel upgrades must have reserved breaker spaces and electrical capacity according to the requirements of 4.106.4.1.1.~~

4.106.4.2 New Multifamily dwellings with new residential parking facilities.

~~**4.106.4.2.1 New Construction.** 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. 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.~~

When parking is provided, parking spaces for new multifamily dwellings, hotels and motels shall meet the requirements of Sections 4.106.4.2.1 and 4.106.4.2.2. Calculations for spaces shall be rounded up to the nearest whole number. A parking space served by electric vehicle supply equipment or designed as a future EV charging space shall count as at least one standard automobile parking space only for the purpose of complying with any applicable minimum parking space requirements established by a local jurisdiction. See Vehicle Code Section 22511.2 for further details.

~~**4.106.4.2.1 Multifamily development projects with less than 20 dwelling units; and hotels and motels with less than 20 sleeping units or guest rooms.** The number of dwelling units, sleeping units or guest rooms shall be based on all buildings on a project site subject to this section.~~

~~**1. EV Capable.** Ten (10) percent of the total number of parking spaces on a building site, provided for all types of parking facilities, shall be electric vehicle charging spaces (EV spaces) capable of supporting future Level 2 EVSE. 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.~~

~~The service panel or subpanel circuit directory shall identify the overcurrent protective device space(s) reserved for future EV charging purposes as “EV CAPABLE” in accordance with the *California Electrical Code*.~~

Exceptions:

1. When EV chargers (Level 2 EVSE) are installed in a number equal to or greater than the required number of EV capable spaces.
2. When EV chargers (Level 2 EVSE) are installed in a number less than the required number of EV capable spaces, the number of EV capable spaces required may be reduced by a number equal to the number of EV chargers installed.

Notes:

a. Construction documents are intended to demonstrate the project's capability and capacity for facilitating future EV charging.

b. There is no requirement for EV spaces to be constructed or available until receptacles for EV charging or EV chargers are installed for use.

2. **EV Ready.** Twenty five (25) percent of the total number of parking spaces shall be equipped with low power Level 2 EV charging receptacles. For multifamily parking facilities, no more than one receptacle is required per dwelling unit when more than one parking space is provided for use by a single dwelling unit.

Exception: Areas of parking facilities served by parking lifts.

4.106.4.2.2 Multifamily development projects with 20 or more dwelling units, hotels and motels with 20 or more sleeping units or guest rooms. The number of dwelling units, sleeping units or guest rooms shall be based on all buildings on a project site subject to this section.

1. **EV Capable.** Ten (10) percent of the total number of parking spaces on a building site, provided for all types of parking facilities, shall be electric vehicle charging spaces (EV spaces) capable of supporting future Level 2 EVSE. 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.

The service panel or subpanel circuit directory shall identify the overcurrent protective device space(s) reserved for future EV charging purposes as "EV CAPABLE" in accordance with the *California Electrical Code*.

Exception: When EV chargers (Level 2 EVSE) are installed in a number greater than five (5) percent of parking spaces required by Section 4.106.4.2.2, Item 3, the number of EV capable spaces required may be reduced by a number equal to the number of EV chargers installed over the five (5) percent required.

Notes:

a. Construction documents shall show locations of future EV spaces.

b. There is no requirement for EV spaces to be constructed or available until receptacles for EV charging or EV chargers are installed for use.

2. **EV Ready.** Twenty five (25) percent of the total number of parking spaces shall be equipped with low power Level 2 EV charging receptacles. For multifamily parking facilities, no more than one receptacle is required per dwelling unit when more than

one parking space is provided for use by a single dwelling unit.

Exception: Areas of parking facilities served by parking lifts.

- ~~3. **EV Chargers.** Five (5) percent of the total number of parking spaces shall be equipped with Level 2 EVSE. Where common use parking is provided, at least one EV charger shall be located in the common use parking area and shall be available for use by all residents or guests.~~

~~When low power Level 2 EV charging receptacles or Level 2 EVSE are installed beyond the minimum required, an automatic load management system (ALMS) may be used to reduce the maximum required electrical capacity to each space served by the ALMS. The electrical system and any on-site distribution transformers shall have sufficient capacity to deliver at least 3.3 kW simultaneously to each EV charging station (EVCS) served by the ALMS. The branch circuit shall have a minimum capacity of 40 amperes and installed EVSE shall have a capacity of not less than 30 amperes. ALMS shall not be used to reduce the minimum required electrical capacity to the required EV capable spaces.~~

4.106.4.2.2 Existing Buildings

1. 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 percent (10%) of the total number of parking spaces added or altered shall be EVCS. Any existing EV Capable spaces on the building property required by the locally adopted codes at the time of building permit shall be upgraded to a minimum of Level 1 EV Ready. Upgrades shall be required at currently designated vehicle parking spaces. Upgrades shall be required for remaining parking spaces after meeting the accessibility requirements of California Building Code Chapters 11A and 11B.
2. When new parking facilities are added and ALMS is installed, the ALMS system must be designed to deliver no less than 2.2 kVa (110/120 volt, 20-ampere).

~~**4.106.4.3.2.2.1 Electric vehicle charging stations (EVCS).** Electric vehicle charging stations required by Section 4.106.4.2.2 shall comply with Section 4.106.4.3.2.2.1.~~

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.

~~**4.106.4.3.12.2.1.1 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 4.106.4.3.12.2.1.1 and Section 4.106.4.3.22.2.1.2.~~

4.106.4.3.2.2.1.2 Electric vehicle charging stations (EVCS) dDimensions. 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 4.106.4.3.2, 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.

4.106.4.2.2.1.3 Accessible EV spaces. In addition to the requirements in Sections 4.106.4.2.2.1.1 and 4.106.4.2.2.1.2, all EVSE, when installed, shall comply with the accessibility provisions for EV chargers in the *California Building Code*, Chapter 11B. EV ready spaces and EVCS in multifamily developments shall comply with *California Building Code*, Chapter 11A, Section 1109A.

4.106.4.4 Direct current fast charging stations. One DCFC may be substituted for up to five (5) EVCS to meet the requirements of 4.106.4.1 and 4.106.4.2. Where ALMS serve DCFC stations, the power demand from the DCFC shall be prioritized above Level 1 and Level 2 spaces.

4.106.4.2.3 EV space requirements.

1. Single EV space required. Install a listed raceway capable of accommodating a 208/240-volt dedicated branch circuit. The raceway shall not be less than trade size 1 (nominal 1-inch inside diameter). The raceway shall originate at the main service or subpanel and shall terminate into a listed cabinet, box or enclosure in close proximity to the location or the proposed location of the EV space. Construction documents shall identify the raceway termination point, receptacle or charger location, as applicable. The service panel and/or subpanel shall have a 40-ampere minimum dedicated branch circuit, including branch circuit overcurrent protective device installed, or space(s) reserved to permit installation of a branch circuit overcurrent protective device.

Exception: A raceway is not required if a minimum 40-ampere 208/240-volt dedicated EV branch circuit is installed in close proximity to the location or the proposed location of the EV space, at the time of original construction in accordance with the *California Electrical Code*.

~~2. **Multiple EV spaces required.** Construction documents shall indicate the raceway termination point and the location of installed or future EV spaces, receptacles, or EV chargers. Construction documents shall also provide information on amperage of installed or future receptacles or EVSE, raceway method(s), wiring schematics and electrical load calculations. Plan design shall be based upon a 40-ampere minimum branch circuit. Required raceways and related components that are planned to be installed underground, enclosed, inaccessible or in concealed areas and spaces shall be installed at the time of original construction.~~

~~**Exception:** A raceway is not required if a minimum 40-ampere 208/240-volt dedicated EV branch circuit is installed in close proximity to the location or the proposed location of the EV space at the time of original construction in accordance with the *California Electrical Code*.~~

~~**4.106.4.2.4 Identification.** The service panel or subpanel circuit directory shall identify the overcurrent protective device space(s) reserved for future EV charging purposes as “EV CAPABLE” in accordance with the *California Electrical Code*.~~

~~**4.106.4.2.5 Electric Vehicle Ready Space Signage.** Electric vehicle 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).~~

~~**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.~~

~~There is no requirement for EV spaces to be constructed or available until EV chargers are installed for use.~~

CHAPTER 5 – Nonresidential Mandatory Measures

SECTION 5.106

SITE DEVELOPMENT

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 adversely impact the construction cost of the project.

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 – Shared Parking Space.

5.106.5.3.1.1 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.

5.106.5.3.1.2 Existing 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 percent (10%) of the total number of parking spaces added or altered shall be EVCS with Level 2 EV Ready. Any existing EV Capable spaces on the building property required by the locally adopted codes at the time of building permit shall be upgraded to a minimum of Level 1 EV Ready. Upgrades shall be required at currently designated vehicle parking spaces. Upgrades shall be required for remaining parking spaces after meeting the accessibility requirements of California Building Code Chapters 11A and 11B.

5.106.5.3.1 — EV capable spaces. [N] EV capable spaces shall be provided in accordance with Table 5.106.5.3.1 and the following requirements:

1. Raceways complying with the *California Electrical Code* and no less than 1" diameter shall be provided and shall originate at a service panel or a subpanel(s) serving the area, and shall terminate in close proximity to the proposed location of the EV capable space and into a suitable listed cabinet, box, enclosure or equivalent. A common raceway may be used to serve multiple EV capable spaces.
2. A service panel or subpanel(s) shall be provided with panel space and electrical load capacity for a dedicated 208/240 volts, 40-ampere minimum branch circuits for each EV capable space, with delivery of 30-ampere minimum to an installed EVSE at each EVCS.
3. The electrical system and any on-site distribution transformers shall have sufficient capacity to supply full rated amperage at each EV capable space.

4. (Formerly 5.106.5.3.4 [N] Identification) The service panel or subpanel circuit directory shall identify the reserved overcurrent protective device space(s) as "EV CAPABLE". The raceway termination location shall be permanently and visibly marked as "EV CAPABLE".

Note: (Relocated from Section 5.106.5.3.5 and edited) A parking space served by electric vehicle supply equipment or designed as a future EV charging space as at least one standard automobile parking space only for the purpose of complying with any applicable minimum parking space requirements established by an enforcement agency. See Vehicle Code Section 22511.2 for further details.

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

TABLE 5.106.5.3.1

TOTAL NUMBER OF ACTUAL PARKING SPACES	NUMBER OF REQUIRED EV CAPABLE SPACES	NUMBER OF EVCS (EV CAPABLE SPACES PROVIDED WITH EVSE)²
0-9	0	0
10-25	4	0
26-50	8	2
51-75	13	3
76-100	17	4
101-150	25	6
151-200	35	9
201 and over	20 percent of total ¹	25 percent of EV capable spaces ¹

1. Calculation for spaces shall be rounded up to the nearest whole number.

2. The number of required EVCS (EV capable spaces provided with EVSE) in column 3 count toward the total number of required EV capable spaces shown in column 2.

...

5.106.5.3.2 Electric vehicle charging stations (EVCS). EV capable spaces shall be provided with EVSE to create EVCS in the number indicated in Table 5.106.5.3.1. The EVCS required by Table 5.106.5.3.1 may be provided with EVSE in any combination of Level 2 and Direct Current Fast Charging (DCFC), except that at least one Level 2 EVSE shall be provided.

One EV charger with multiple connectors capable of charging multiple EVs simultaneously shall be permitted if the electrical load capacity required by Section 5.106.5.3.1 for each EV capable space is accumulatively supplied to the EV charger.

The installation of each DCFC EVSE shall be permitted to reduce the minimum number of required EV capable spaces without EVSE by five and reduce proportionally the required electrical load capacity to the service panel or subpanel.

5.106.5.3.2 Hotel and Motel Occupancies – Shared Parking Facilities.

5.106.5.3.2.1 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.

5.106.5.3.2.2 Existing 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 percent (10%) of the total number of parking spaces added or altered shall be EVCS with Level 2 EV Ready. Any existing EV Capable spaces on the building property required by the locally adopted codes at the time of building permit shall be upgraded to a minimum of Level 1 EV Ready. Upgrades shall be required at currently designated vehicle parking spaces. Upgrades shall be required for remaining parking spaces after meeting the accessibility requirements of California Building Code Chapters 11A and 11B.

5.106.5.3.3 All Other Nonresidential Occupancies – Shared Parking Facilities.

5.106.5.3.3.1 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.

5.106.5.3.3.2 Existing 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 percent (10%) of the total number of parking spaces added or altered shall be EVCS with Level 2 EV Ready. Any existing EV Capable spaces on the building property required by the locally adopted codes at the time of building permit shall be upgraded to a minimum of Level 1 EV Ready. Upgrades shall be required at currently designated vehicle parking spaces. Upgrades shall be required for remaining parking spaces after meeting the accessibility requirements of California Building Code Chapters 11A and 11B.

5.106.5.3.3 Use of automatic load management systems (ALMS). ALMS shall be permitted for EVCS. When ALMS is installed, the required electrical load capacity specified in Section 5.106.5.3.1 for each EVCS may be reduced when serviced by an EVSE controlled by an ALMS. Each EVSE controlled by an ALMS shall deliver a minimum 30 amperes to an EV when charging one vehicle and shall deliver a minimum 3.3 kW while simultaneously charging multiple EVs.

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.

~~5.106.5.3.4 Accessible EVCS.~~ When EVSE is installed, accessible EVCS shall be provided in accordance with the *California Building Code Chapter 11B Section 11B-228.3*.

~~Note:~~ For EVCS signs, refer to Caltrans Traffic Operations Policy Directive 13-01 (Zero Emission Vehicle Signs and Pavement Markings) or its successor(s).

5.106.5.4 Electric vehicle (EV) charging readiness. 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. 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 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.

5.106.5.4.1 Electric vehicle charging readiness requirements for warehouses, grocery stores and retail stores with planned off-street loading spaces. 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 5.106.5.4.1.1 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 off-street 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 5.106.5.4.1.1.
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 EVs as shown in Table 5.106.5.4.1.1.

TABLE 5.106.5.4.1.1, Raceway Conduit and Panel power Requirements for Medium-and-Heavy-Duty EVSE

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