~~DRAFT, NOT FOR CITATION~~

Introduction: ~~This draft language modifies the base code language that will be in effect on January 1, 2020. It utilizes regional model code language and has been tailored based on our stakeholder feedback and internal discussions so far. The regional codes group developed two versions of the model code language, one focused on reducing energy use and one focused on emissions. As San José's strategy is to reduce emissions, this draft code language is based on the emissions reduction model.~~

This reach code draft includes requirements to foster solar photovoltaic (PV), building electrification, and electric vehicle (EV) charging infrastructure.

Solar PV: The language expands the requirements for solar-readiness in the base code to cover all ~~buildings~~ non-residential buildings, preserving the base code exemption for buildings where the installation of solar PV is technically infeasible. *(Section 100.1(b))*

Electrification: The language requires greater efficiency and electrification readiness from mixed fuel buildings and base code compliance from all-electric buildings in order to incentivize the construction of all-electric buildings and to reduce the emissions from mixed-fuel buildings and prepare them for future electrification. ~~Model language that requires "electrification readiness" has been removed in accordance with internal discussions.~~ *(Sections 140.1 & 140.2 for non-residential and Section 150.1 for low-rise residential.)*

E~~lectric~~ V~~ehicle~~ Charging Infrastructure: The language establishes minimum levels of EV Supply Equipment, EV Ready, and EV Capable spaces for buildings based on buildings type. *(Section 110.10)*

Solar PV Requirements:

SECTION 110.10 is modified as follows:

(a) Covered Occupancies.

1. Single Family Residences. Single family residences located in subdivisions with ten or more single family residences and where the application for a tentative subdivision map for the residences has been deemed complete approved by the enforcement agency, which do not have a photovoltaic system installed, shall comply with the requirements of Section 110.10(b) through 110.10(e).
2. Low-rise Multifamily Buildings. Low-rise multi-family buildings that do not have a photovoltaic system installed shall comply with the requirements of Section 110.10(b) through 110.10(d).
3. Hotel/Motel Occupancies and High-rise Multifamily Buildings. Hotel/motel occupancies and high-rise multifamily buildings ~~with ten habitable stories or fewer~~ shall comply with the requirements of Section 110.10(b) through 110.10(d).
4. Nonresidential Buildings. Nonresidential buildings ~~with three habitable stories or fewer, other than healthcare facilities,~~ shall comply with the requirements of Section 110.10(b) through 110.10(d).

Electrification:

Definitions:

Section 100.1(b) is modified by adding the following definitions:

ALL-ELECTRIC BUILDING or ALL-ELECTRIC DESIGN is a building or building design that uses a permanent supply of electricity as the source of energy for all space heating, water heating (including pools and spas), cooking appliances, and clothes drying appliances, and has no natural gas or propane plumbing installed in the building.

CERTIFIED ENERGY ANALYST is a person registered as a Certified Energy Analyst with the California Association of Building Energy Consultants as of the date of submission of a Certificate of Compliance as required under Section 10-103.

MIXED-FUEL BUILDING or MIXED-FUEL DESIGN is a building or building design that uses natural gas or propane as fuel for space heating, water heating (including pools and spas), cooking appliances or clothes drying appliances or is plumbed for such equipment.

Non-Residential Requirements:

SECTION 140.0(b) is modified as follows:

(b) The requirements of Sections 120.0 through 130.5 (mandatory measures for nonresidential, high-rise residential and hotel/motel buildings). and the following:

1. Mixed-fuel buildings shall include the following components:

A. Water Heaters

i. A dedicated 240 electrical receptacle with a minimum capacity of 30 amps that is connected to the electrical panel with conductors of adequate capacity, within 3 feet from the water heater and accessible to the water heater with no obstructions.

ii. Both ends of the unused conductor shall be labeled with the words “For Future Heat Pump Water Heater” and be electrically isolated.

iii. A condensate drain that is no more than 2 inches higher than the base of the installed water heater and allows natural draining without pump assistance.

iv. Located in an area with a minimum of 700 cubic feet of volume, or a ducting plan for eight-inch supply and exhaust ducts to the exterior or a space with 700 cubic feet of volume.

Exception to 140.0(b)2.A.iv. The space and ventilation requirements may be reduced to conform with the manufacturer’s recommendations for a specific heat pump hot water heater that meets the requirements of Sections 110.0, 110.1 and 110.3.

B. Clothes Drying

i. A dedicated 240-volt electrical receptacle with a minimum capacity of 340 amps that is connected to the electrical panel with conductors of adequate capacity, within 3 feet of the appliance and accessible with no obstructions.

ii. Both ends of the unused conductor shall be labeled with the words "For Future Heat Pump Clothes Drying" and be electrically isolated.

C. Cooktop or Range A dedicated 240-volt electrical receptacle with a minimum capacity of 50 amps that is connected to the electrical panel with conductors of adequate capacity, within 3 feet of the appliance and accessible with no obstructions.

i. Both ends of the unused conductor shall be labeled with the words "For Future Inductive Range" and be electrically isolated.

EXCEPTION to 140.0(b)2.A, B, and C: If gas or propane plumbing is not installed for the specified end uses.

D. Other Gas Equipment.

i. For equipment that is specified or connected to natural gas or propane plumbing, the building shall include designated raceways and reserved capacity on the main electrical panel and subpanels, if applicable, sufficient to power electric equipment that provides the equivalent function as the intended function of the gas equipment; or,

ii. If gas plumbing exists but no gas equipment is specified or connected, the building shall include designated raceways and reserved capacity on the main electrical panel and subpanels, if applicable, sufficient to provide equivalent power at a maximum gas flow rate under normal gas service pressure. Plans shall include calculations for delivered gas power and equivalent electrical power, conductors, raceway sizes and panel capacities.

Exception to 140.0(b)2.D. If the applicant demonstrates that there is no viable electrical equipment that can perform the intended function of the gas equipment.

E. All newly installed raceways between the main electrical panel and any subpanels, and the point at which the conductors serving the building connect to the common conductors of the utility distribution system shall be sized for conductors adequate to serve all of the building's electrical requirements, including PV as specified Section 140.0(b)1 and future electric loads as specified in Section 140.0(b)2.

F. If the building includes an electrical transformer(s) feeding the main panel or any subpanels, the transformer(s) shall be located in a space large enough to accommodate a transformer(s) with a rated capacity sufficient to serve all of the building's electrical requirements, including PV as specified in Section 140.0(b)1 and future electric loads as specified in Section 140.0(b)2.

SECTION 140.1 is modified as follows:

SECTION 140.1 – PERFORMANCE APPROACH: ENERGY BUDGETS

A ~~building~~ newly constructed All-Electric Building complies with the performance approach if the energy budget calculated for the Proposed Design Building under Subsection (b) is no greater than the energy budget calculated for the Standard Design Building under Subsection (a).

A newly constructed Mixed-Fuel Building complies with the performance approach if the compliance margin exceeds the value in Table 140.1-A below. The compliance margin shall be calculated by subtracting the energy budget calculated for the Proposed Design Building under Subsection (b) from the energy budget calculated for the Standard Design Building under Subsection (a) and dividing the result by the energy budget calculated for the Standard Design Building under Subsection (a).

Table 140.1-A MIXED FUEL BUILDING COMPLIANCE MARGINS

Occupancy Type	Compliance Margins
Office	10~~4~~%
Retail	10~~5~~%
Hotel/M~~m~~otel and High-rise R~~r~~esidential	5~~7~~%
~~All other occupancies~~ Industrial/ Warehouse	0~~7~~%
All Other Occupancies	5%

(a) Energy Budget for the Standard Design Building. The energy budget for the Standard Design Building is determined by applying the mandatory and prescriptive requirements to the Proposed Design Building. The energy budget is the sum of the TDV energy for space-conditioning, indoor lighting, mechanical ventilation, service water heating, and covered process loads.

(b) Energy Budget for the Proposed Design Building. The energy budget for a Proposed Design Building is determined by calculating the TDV energy for the Proposed Design Building. The energy budget is the sum of the TDV energy for space-conditioning, indoor lighting, mechanical ventilation and service water heating and covered process loads.

(c) Calculation of Energy Budget. The TDV energy for both the Standard Design Building and the Proposed Design Building shall be computed by Compliance Software certified for this use by the Commission. The processes for Compliance Software approval by the Commission are documented in the ACM Approval Manual.

EXCEPTION to Section 140.1. For newly constructed buildings, if the Certificate of Compliance is prepared and signed by a Certified Energy Analyst and the energy budget for the Proposed Design is no greater than the Standard Design Building, the required compliance margin is reduced by 1%.

NOTE: Authority: Sections 25213, 25218, 25218.5, 25402 and 25402.1, Public Resources Code. Reference: Sections 25007, 25008, 25218.5, 25310, 25402, 25402.1, 25402.4, 25402.5, 25402.8, and 25943, Public Resources Code.

SECTION 140.2 is modified as follows:

To comply using the prescriptive approach, a building shall be designed with and shall have constructed and installed systems and components meeting the applicable requirements of Sections 140.3 through 140.9 and the following requirements as applicable:

(a) Hotels and Motels

1. Install fenestration with a solar heat gain coefficient no greater than 0.22.
2. Design Variable Air Volume (VAV) box minimum airflows to be equal to the zone ventilation minimums.
3. Include economizers and staged fan control in air handlers with a mechanical cooling capacity ≥ 33,000 Btu/h.
4. Reduce the lighting power density (Watts/ft2) by ten percent (10%) from that required from Table 140.6-C.
5. In common areas, improve lighting without claiming any Power Adjustment Factor credits:
    A. Control to daylight dimming plus off per Section 140.6(a)2H, and
    B. Perform Institutional Tuning per Section 140.6(a)2J
6. Install one drain water heat recovery device per every three guest rooms that is field verified as specified in the Reference Appendix RA3.6.9.

(b) All Other Nonresidential Buildings

1. Install fenestration with a solar heat gain coefficient no greater than 0.22.
2. Limit the fenestration area on east-facing and west-facing walls to one-half of the average amount of north-facing and south-facing fenestration.
3. Design Variable Air Volume (VAV) box minimum airflows to be equal to the zone ventilation minimums where VAV systems are installed.
4. Include economizers and staged fan control in air handlers with a mechanical cooling capacity ≥ 33,000 Btu/h.
5. Reduce the lighting power density (Watts/ft^2) by ten percent (10%) from that required from Table 140.6-C.
6. Improve lighting without claiming any Power Adjustment Factor credits:
    A. Perform Institutional Tuning per Section 140.6(a)2J, and
    B. In office spaces, control to daylight dimming plus off per Section 140.6(a)2H, and
    C. Install Occupant Sensing Controls in Large Open Plan Offices per Section 140.6(a)2I.

Low-Rise Residential Requirements:

Section 150.0 is modified to change the first two paragraphs as follows:

SECTION 150.0 – MANDATORY FEATURES AND DEVICES

Low-rise residential buildings shall comply with the applicable requirements of Sections 150(a) through 150.0(~~r~~s).

NOTE: The requirements of Sections 150.0(a) through 150.0(~~r~~s) apply to newly constructed buildings. Sections 150.2(a) and 150.2(b) specify which requirements of Sections 150.0(a) through 150.0(~~r~~s) also apply to additions or alterations.

Section 150.0(h) is modified to add a new subsection (5) as follows:

5. Systems using gas or propane space heating equipment shall include the following components:

   A. A designated exterior location for a future heat pump compressor unit with either a drain or natural drainage for condensate from possible future operation as cooling equipment.

   B. A dedicated 240 volt, 30 amp electrical circuit that is connected to the electrical panel with conductors of adequate capacity, terminating within 3 feet from the designated future location of the compressor unit with no obstructions. In addition, all of the following:

      i. Both ends of the unused conductor shall be labeled with the word "For Future Heat Pump Space Heater" and be electrically isolated; and

      ii. A double pole circuit breaker in the electrical panel labeled with the words "For Future Heat Pump Space Heater".

      EXCEPTION to Section 150.0(h)5.B. If a 240 volt electrical circuit with a minimum capacity of 30 amps exists for space cooling equipment.

Section 150.0(n) is modified as follows:

(c) Water Heating System.

1. Systems using gas or propane water heaters to serve individual dwelling units shall include the following components:

   A. A dedicated ~~125 volt~~240 volt, ~~20~~ 30 amp electrical receptacle that is connected to the electrical panel with conductors of adequate capacity ~~a 120/240 volt 3 conductor, 10 AWG copper branch circuit~~, within 3 feet from the water heater and accessible to the water heater with no obstructions. In addition, all of the following:

      i. Both ends of the unused conductor shall be labeled with the words "~~spare~~For Future Heat Pump Water Heater" and be electrically isolated; and

      ii. ~~A reserved single pole circuit breaker space in the electrical panel adjacent to the circuit breaker for the branch circuit in A above and labeled with the words "Future 240V Use~~ A double pole circuit breaker in the electrical panel labeled with the words "For Future Heat Pump Water Heater".

   B. A Category III or IV vent, or a Type B vent with straight pipe between the outside termination and the space where the water heater is installed; and

C. A condensate drain that is no more than 2 inches higher than the base of the installed water heater, and allows natural draining without pump assistance, and

D. ~~A gas supply line with a capacity of at least 200,000 Btu/hr.~~ Located in an area that is both:

i. At least 3 feet by 3 feet by 7 feet high; and

ii. Has a minimum volume of 760 cubic feet or a ventilation plan that includes the equivalent of one 16 inch by 24 inch grill for warm supply air and one 8 inch duct of no more than 10 feet in length for cool exhaust air.

Exception 1 to 150.0(n)1.D. The space and ventilation requirements may be reduced to conform with the manufacturer's recommendations for a specific heat pump hot water heater that meets the requirements of Sections 110.0, 110.1 and 110.3.

EXCEPTION 2 to Section 150.0(n)1.D. Free Standing Accessory Dwelling Units.

2. Water heating recirculation loops serving multiple dwelling units shall meet the requirements of Section 110.3(c)5.

3. Solar water-heating systems and collectors shall be certified and rated by the Solar Rating and Certification Corporation (SRCC), the International Association of Plumbing and Mechanical Officials, Research and Testing (IAPMO R&T), or by a listing agency that is approved by the Executive Director.

4. Instantaneous water heaters with an input rating greater than 6.8 kBTU/hr (2kW) shall meet the requirements of Section 110.3(c)7.

5. Systems using gas or propane water heaters to serve multiple dwelling units and/or common areas shall:

A. Be located in a space that can accommodate a heat pump water heating system of equivalent capacity and performance; and

B. Have a condensate drain that is no more than 2 inches higher than the base of the installed water heater, and allows natural draining without pump assistance; and

C. Include designated raceways and reserved capacity on the main electrical panel and subpanels, if applicable, sufficient to power one or more heat pump hot water heaters of equivalent combined capacity and performance. Plans shall include calculations for equivalent capacity and performance, electrical power, conductors, raceway sizes and panel capacities.

Section 150.0 is modified to add a new subsection (s) as follows:

(s) Clothes Drying and Cooking. Buildings plumbed for natural gas or propane clothes drying or cooking equipment shall include the following components for each gas terminal or stub out:

1. Clothes Drying.

A. A dedicated 240-volt, 30 amp electrical receptacle that is connected to the electrical panel with conductors of adequate capacity, within 3 feet of the appliance and accessible with no obstructions. In addition, all of the following:

i. Both ends of the unused conductor shall be labeled with the word "For Future Heat Pump Clothes Dryer" and be electrically isolated; and

ii. A double pole circuit breaker in the electrical panel labeled with the words "For Future Heat Pump Clothes Dryer".

2. Cooking Range

A. A dedicated 240-volt, 50 amp electrical receptacle that is connected to the electrical panel with conductors of adequate capacity, within 3 feet of the appliance and accessible with no obstructions. In addition, all of the following:

i. Both ends of the unused conductor shall be labeled with the word "For Future Electric Range" and be electrically isolated; and

ii. A double pole circuit breaker in the electrical panel labeled with the words "For Future Inductive Range".

Section 150.1(b) is modified as follows:

(b) Performance Standards. ~~A building complies with the performance standards if the energy consumption for the Proposed Design Building is no greater than the energy budget calculated for the Standard Design Building~~ Building performance is calculated using Commission-certified compliance software as specified by the Alternative Calculation Methods Approval Manual.

Sections 150.1(b)1 and 2 are modified as follows:

1. Newly Constructed Buildings. The Energy Budget for newly constructed buildings is expressed in terms of the Energy Design Rating, which is based on TDV energy. The Energy Design Rating (EDR) has two components, the Energy Efficiency Design Rating, and the Solar Electric Generation and Demand Flexibility Design Rating. The Solar Electric Generation and Demand Flexibility Design Rating shall be subtracted from the Energy Efficiency Design Rating to determine the Total Energy Design Rating. The Proposed Building shall separately comply with the Energy Efficiency Design Rating and the Total Energy Design Rating.

A. An All-Electric Building ~~or a Free Standing Accessory Dwelling Unit~~ complies with the performance standard if both the Total Energy Design Rating and the Energy Efficiency Design Rating for the Proposed Building are no greater than the corresponding Energy Design Ratings for the Standard Design Building.

B. A Mixed-Fuel Building complies with the performance standards if the Energy Efficiency Design Rating of the Proposed Building is no greater than the Energy Efficiency Design Rating for the Standard Design Building; and if the Total Energy Design Rating for the Proposed Building is at least 10 points less than the Total Energy Design Rating for the Standard Design Building.

EXCEPTION 1 to Section 150.1(b)1.B. If the Certificate of Compliance is prepared and signed by a Certified Energy Analyst and the Total Energy Design Rating of the Proposed Design is no greater than the Standard Design Building, the Total Energy Rating of the Proposed Building required by Section 150.1(b)1.B may be reduced by 1.

EXCEPTION 2 to Section 150.1(b)1.B. Buildings with limited solar access are excepted if all of the following are true:

a. The Total Energy Design Rating for the Proposed Building is no greater than the Standard Design Building; and

b. A photovoltaic (PV) system(s) meeting the minimum qualification requirements as specified in Joint Appendix JA11 is installed on all available areas of 80 contiguous square feet or more with effective annual solar access. Effective annual solar access shall be 70 percent or greater of the output of an unshaded PV array on an annual basis, wherein shade is due to existing permanent natural or manmade barriers external to the dwelling, including but not limited to trees, hills, and adjacent structures; and

c. The Energy Efficiency Energy Design Rating for the Proposed Building is at least 2 points less than the Total Energy Design Rating for the Standard Design Building for Single Family Residences and at least 1 point less than the Total Energy Design Rating for the Standard Design Building for Low-Rise Multifamily Buildings.

EXCEPTION to Section 150.1(b)1. A community shared solar electric generation system, or other renewable electric generation system, and/or community shared battery storage system, which provides dedicated power, utility energy reduction credits, or payments for energy bill reductions, to the permitted building and is approved by the Energy Commission as specified in Title 24, Part 1, Section 10-115, may offset part or all of the solar electric generation system Energy Design Rating required to comply with the Standards, as calculated according to methods established by the Commission in the Residential ACM Reference Manual.

2. Additions and Alterations to Existing Buildings. The Energy Budget for additions and alterations is expressed in terms of TDV energy. A building complies with the performance standards if the energy consumption calculated for the Proposed Building is no greater than the energy budget calculated for the Standard Design Building.

The first paragraph of Section 150.1(c) is modified as follows:

Prescriptive Standards/Component Package. Buildings that comply with the prescriptive standards shall be designed, constructed, and equipped to meet all of the requirements for the appropriate Climate Zone shown in TABLE 150.1-A or B. In TABLE 150.1-A and TABLE 150.1-B, a NA (not allowed) means that feature is not permitted in a particular Climate Zone and a NR (no requirement) means that there is no prescriptive requirement for that feature in a particular Climate Zone as well as all of the requirements of Section 150.1(c)15 and 16, whichever are more stringent. Installed components shall meet the following requirements:

New Sections 150.1(c)15 and 16 are added as follows:

15. Additional Prescriptive Requirements for Single Family buildings.

A. Duct System Sealing and Leakage Testing. The duct systems shall exceed the minimum mandatory requirements of Section 150.0(m)11 A and B such that the total duct system leakage shall not exceed 2 percent of the nominal system air handler air flow.

~~B. Slab insulation. Slab floor perimeter insulation shall be installed with an R-value equal to or greater than R10. The minimum depth of concrete slab floor perimeter insulation shall be 16 inches or the depth of the footing of the building, whichever is less.~~

~~C.~~B. Compact Hot Water. The hot water distribution system shall be designed and installed to meet minimum requirements for the basic compact hot water distribution credit according to the procedures outlined in the 2019 Reference Appendices RA4.4.6.

~~D.~~C. Ducted Central Forced Air Heating Systems. Central Fan Integrated Ventilation Systems. The duct distribution system shall be designed reduce external static pressure to meet a maximum fan efficacy equal to:

Gas Furnaces: 0.35 Watts per cfm

Heat Pumps: 0.45 Watts per cfm,

according to the procedures outlined in the 2019 Reference Appendices RA 3.3.

~~E.~~D. Energy Storage. A battery energy storage system with a minimum capacity equal to 5 kWh shall be installed. The system shall have automatic controls programmed to charge anytime PV generation is greater than the building load and discharge to the electric grid, beginning during the highest priced time of use hours of the day.

16. Additional Prescriptive Requirements for Multifamily buildings.

A. Ducts in Conditioned Space. All ductwork shall be located entirely in conditioned space with ducts tested to have less than or equal to 25 cfm leakage to outside. Ductwork shall meet the requirements of Verified Low Leakage Ducts in Conditioned Space (VLLDCS) in the 2019 Reference Appendices RA3.1.4.3.8.

B. Roofing Products. Low-rise residential buildings with steep-sloped roofs shall have a minimum aged solar reflectance of 0.25.

~~C. Slab insulation. Slab floor perimeter insulation shall be installed with an R-value of equal to or greater than R10. The minimum depth of concrete-slab floor perimeter insulation shall be 16 inches or the depth of the footing of the building, whichever is less.~~

~~D.~~C. Compact Hot Water. The hot water distribution system shall be designed and installed to meet minimum requirements for the basic compact hot water distribution credit according to the procedures outlined in the 2019 Reference Appendices RA4.4.6.

~~E.~~D. Central Fan Integrated Ventilation Systems. Central forced air system fans used to provide outside air, shall have an air-handling unit fan efficacy less than or equal to 0.35 W/CFM. The airflow rate and fan efficacy requirements in this section shall be confirmed through field verification and diagnostic testing in accordance with all applicable procedures specified in Reference Residential Appendix RA3.3. Central Fan Integrated Ventilation Systems shall be certified to the Energy Commission as

Intermittent Ventilation Systems as specified in Reference Residential Appendix RA3.7.4.2.

~~F.~~E. Solar photovoltaic. A PV system meeting the minimum qualification requirements as specified in Joint Appendix JA11 sized to offset 100%, or amount as allowed by governing regulations, of the estimated site electricity load shall be installed. The plans shall include calculations for the electricity load and PV production.

~~G.~~F. Energy Storage. A battery energy storage system with a capacity equivalent to the PV system shall be installed. The system shall have automatic controls programmed to charge anytime PV generation is greater than the building load and discharge to the electric grid, beginning during the highest priced time of use hours of the day.

Electric Vehicle Charging Infrastructure

Definitions:

NEW DEFINITIONS ADDED TO SECTION 202

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

Electric Vehicle Supply Equipment (EVSE). The electrical conductors and equipment external to the electric vehicle that provide a connection between an electric vehicle and a power source to provide electric vehicle charging.

Electric Vehicle Fast Charger. Electric vehicle supply equipmentwith a minimum power output of 20 kW.

Electric Vehicle Load Management System. A system designed to allocate charging capacity among multiple electric vehicle supply equipment.

Electric Vehicle Capable Space. A designated parking space that is provided with conduit sized for a 40-amp, 208/240-Volt dedicated branch circuit from a building electrical service panel to the parking space and sufficient physical space in the same building electrical service panel to accommodate a 40 amp dual-pole circuit breaker.

Electric Vehicle Ready Space. A parking space that is provided with one 40 amp, 208/240 volt dedicated branch circuit for electric vehicle supply equipment that is terminated at a receptacle, junction box or electric vehicle supply equipment within the parking space.

Electric vehicle supply equipment (EVSE) ~~S~~space. A parking space with electric vehicle supply equipment capable of supplying current at 3240 amps at 208/240 volts and a minimum of 8 amps at 208/240 volts when connected to an E~~e~~lectric V~~v~~ehicle L~~l~~oad M~~m~~anagement S~~s~~ystem.

Low-Rise Residential Requirements:

4.106.4 Electric vehicle (EV) charging for new construction. New construction shall comply with Sections 4.106.4.1 ~~and 4.106.4.2~~ to facilitate current and future ~~installation and use of EV chargers~~ *electric vehicle* charging. *Electric vehicle supply equipment (EVSE)* shall be installed in accordance with the *California Electrical Code,* Article 625.

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 commercial power supply.

   1.2. Where there is evidence substantiating that meeting the requirements will alter the local utility infrastructure design requirements on the utility side of the meter so as to increase the utility side cost ~~to the homeowner or the developer~~ by more than ~~$400.00 per dwelling unit~~ an average of $4,500 per *electric capable, electric vehicle ready* and *electric vehicle supply equipment spaces*. If costs are found to exceed this level, the applicant shall provide EV infrastructure up to a level that would not exceed this cost for utility service or on-site transformer capacity.

Note: The reach code multifamily $4,500 per unit-parking space utility cost exemption is based on extrapolating the CALGreen 2019 exemption (and associated charging infrastructure requirements) to that of the reach code charging infrastructure requirements. Specifically, the CALGreen 2019 code includes a $400 per dwelling unit exception and an associated 10% EV capable per parking space requirement. That is a 10-1 ratio of dwelling units to spaces, equating to $4,000 per impacted parking space. Further, the $4,000 figure was adjusted to $4,500 to more accurately represent construction costs in San Jose as compared to the California average (https://lao.ca.gov/reports/2015/finance/housing-costs/housing-costs.aspx). Finally, the exception was also broadened to address any on-site transformer costs.

2. Accessory Dwelling Units (ADU) and Junior Accessory Dwelling Units (JADU) without additional parking facilities.

4.106.4.1 New one- and two-family dwellings and townhouses with attached and detached private garages. ~~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 raceway shall originate at the 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 minimum dedicated branch circuit and space(s) reserved to permit installation of a branch circuit overcurrent protective device.~~ Each dwelling unit shall be provided with one *EV Ready space.*

Exception: Detached private garages without electrical service.

~~**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".~~

4.106.4.2 New multifamily dwellings. If residential parking is available, ten (10) ~~fifty (50)~~ percent of the total number of parking spaces on a building site provided for all types of parking facilities ~~or one per every two *dwelling units*, whichever is less,~~ shall be EVSE ~~electric vehicle charging~~ spaces ~~(EV spaces) capable of supporting future EVSE *electric vehicle supply equipment spaces* or *electric vehicle ready spaces*~~. Fifty (50) percent of a~~A~~ll other parking spaces shall be *electric vehicle capable spaces.* Calculations for the required number of EV spaces shall be rounded up to the nearest whole number.

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.

4.106.4.2.1 Electric vehicle charging space (EV space) locations. Construction documents shall indicate the location of proposed EV spaces. Where common use parking is provided, at least one EV space shall be located in the common use parking areas and shall be available for use by all residents.

4.106.4.2.1,1 Electric vehicle charging stations (EVCS). ~~When EV chargers are installed, EV spaces required by Section 4.106.4.2.2, Item 3,~~ EVCS shall comply with the 2019 California Building Code.~~at least one of the following options:~~

~~1. The EV space shall be located adjacent to an accessible parking space meeting the requirements of the *California Building Code,* Chapter 11 A, to allow use of the EV charger from the accessible parking space.~~
~~2. The EV 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.Z. Uem.,3~~

4.106.4.2.2 Electric vehicle charging space (EV space) dimensions. The EV spaces shall comply with the 2019 California Building Code. ~~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 EV 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.~~

4.106.4.2.3 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 proposed location of the EV spaces. Construction documents shall identify the raceway termination point. The service panel and/or subpanel shall provide capacity to install a 40-ampere minimum dedicated branch circuit and space(s) reserved to permit installation of a branch circuit overcurrent protective device.

~~**4.106.4.2.3 Multifamily *electric vehicle ready spaces*.** The circuit capacity of up to 75 percent of the *electric vehicle ready spaces* required by Section 5.106.5.3.1 in multifamily buildings, 90 percent in affordable housing projects, may be reduced to 15 amps at 120 volts provided the wiring is sized for a circuit capacity of 40 amps at 208/240 volts.~~

~~**4.106.4.2.4 Multiple EV spaces required.** Construction documents shall indicate the raceway termination point and proposed location of future EV spaces and EV chargers. Construction documents shall also provide information on amperage of future EVSE, raceway method(s), wiring schematics and electrical load calculations to verify 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 the full rated amperage of the EVSE. Plan design shall be based upon a 40-ampere minimum branch circuit. 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.~~

4.106.4.2.~~3~~5 Identification. The service panel or subpanel circuit directory shall identify the overcurrent

protective device space(s) reserved for ~~future EV charging purposes~~ *electric vehicle capable spaces* as "EV CAPABLE" in accordance with the California Electrical Code.

Notes:

1. The California Department of Transportation adopts and publishes the "California Manual on Uniform Traffic Control Devices (California MUTCD)" to provide uniform standards and specifications for all official traffic control devices in California. Zero Emission Vehicle Signs and Pavement Markings can be found in the New Policies & Directives Number 13-01. Website: http://www.dot.ca.gov/-trafficops/policy/13-01-.pdf
2. See Vehicle Code Section 22511 for EV charging space signage in off-street parking facilities and for use of EV charging spaces.
3. The Governor's Office of Planning and Research (OPR) published a "Zero-Emission Vehicle Community Readiness Guidebook" which provides helpful information for local governments, residents and businesses. Website: http://opr.ca.gov/docs/ZEV_Guidebook.pdf.

Non-Residential and High-Rise Requirements:

5.106.5.3 Electric vehicle (EV) charging. [N] Construction shall comply with Section 5.106.5.3.1 ~~or through Section 5.106.5.3.2~~3 to facilitate ~~future installation of electric vehicle supply equipment (EVSE). When EVSE(s) is/are installed, it shall be in accordance with the *California Building Code,* the *California Electrical Code* and as follows~~ current and future *electric vehicle* charging. *Electric vehicle supply equipment (EVSE)* shall be installed in accordance with the *California Electrical Code,* Article 625.

~~**5.106.5.3.1 Single charging space requirements. [N]** When only a single charging space is required per Table 5.106.5.3.3, a raceway is required to be installed at the time of construction and shall be installed in accordance with the *California Electrical Code,* construction plans and specifications shall include, but are not limited to, the following:~~

~~1. The type and location of the EVSE.~~
~~2. A listed raceway capable of accommodating a 208/240-volt dedicated branch circuit.~~
~~3. The raceway shall not be less than trade size 1."~~
~~4. The raceway shall originate at a service panel or a subpanel serving the area, and shall terminate in close proximity to the proposed location of the charging equipment and into a listed suitable cabinet, box, enclosure or equivalent.~~
~~5. The service panel or subpanel shall have sufficient capacity to accommodate a minimum 40-ampere dedicated branch circuit for the future installation of the EVSE.~~

~~**5.106.5.3.2 Multiple charging space requirements. [N]** When multiple charging spaces are required per Table 5.106.5.3.3 raceway(s) is/are required to be installed at the time of construction and shall be installed in accordance with the *California Electrical Code.* Construction plans and specifications shall include, but are not limited to, the following:~~

~~1. The type and location of the EVSE.~~
~~2. The raceway(s) 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 charging equipment and into listed suitable cabinet(s), box(es), enclosure(s) or equivalent.~~
~~3. Plan design shall be based upon 40-ampere minimum branch circuits.~~

~~4. Electrical calculations shall substantiate the design of the electrical system, to include the rating of equipment and any on-site distribution transformers and have sufficient capacity to simultaneously charge all required EVs at its full rated amperage.~~

~~5. The service panel or subpanel(s) shall have sufficient capacity to accommodate the required number of dedicated branch circuit(s) for the future installation of the EVSE.~~

5.106.5.3.1~~3~~ EV charging space calculation. [N] ~~Table 5.106.5.3.3 shall be used to determine if single or multiple charging space requirements apply for the future installation of EVSE.~~ A minimum percentage of the total number of parking spaces provided for all types of parking facilities shall be provided with *electrical vehicle* charging in accordance with Table 5.106.5.3.1. Calculations for the required number of *electric vehicle* spaces shall be rounded up to the nearest whole number.

Exceptions: On a case-by-case basis where the local enforcing agency has determined EV charging and infrastructure is not feasible based upon one or more of the following conditions:

1. Where there is insufficient electrical supply.
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 5.106.5.3.1, may adversely impact the construction cost of the project.

TABLE 5.106.5.3.~~3~~1

~~TOTAL NUMBER OF ACTUAL PARKING SPACES~~	~~NUMBER OF REQUIRED EV CHARGING SPACES~~
~~0-9~~	~~0~~
~~10-25~~	~~1~~
~~26-50~~	~~2~~
~~51-75~~	~~4~~
~~76-100~~	~~5~~
~~101-150~~	~~7~~
~~151-200~~	~~10~~
~~201 and over~~	~~6 percent of total[1]~~

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

BUILDING TYPE	Electric vehicle supply equipment spaces	Electric Vehicle Ready Spaces	Electric vehicle capable spaces
~~**OFFICE**~~	~~10%~~	~~0%~~	~~40%~~

MULTIFAMILY HIGH-RISE	10%	~~500%~~[1]	50%
ALL OTHER NON-RESIDENTIAL	10%	0%	40%

~~1. The number of *electric vehicle ready spaces* required by section 5.106.5.3.1 may also be calculated at one *electric vehicle ready space* for every two *dwelling units* where all other parking spaces are *electric vehicle capable spaces. Electric vehicle supply equipment spaces* shall satisfy requirements for *electric vehicle ready spaces.*~~

5.106.5.3.2 Electric service capacity for *electric vehicle capable spaces*. The building electrical panel that contains the physical space to accommodate the future installation of circuit breakers for *electric vehicle capable spaces* required by Section 5.106.5.3.1 shall have sufficient electrical capacity to provide no less than 8 amps at 208/240 volts per *electric vehicle capable space.*

~~**5.106.5.3.3 Multifamily *electric vehicle ready spaces*.** The circuit capacity of up to 75 percent of the *electric vehicle ready spaces* required by Section 5.106.5.3.1 in multifamily buildings, 90 percent in affordable housing projects, may be reduced to 15 amps at 120 volts provided the wiring is sized for a circuit capacity of 40 amps at 208/240 volts.~~

5.106.5.3.4 [N] Identification. The service panel or subpanel(s) circuit directory shall identify the reserved overcurrent protective device space(s) for ~~future EV charging~~ *electric vehicle capable spaces* as "EV CAPABLE". The raceway termination location shall be permanently and visibly marked as "EV CAPABLE."

~~**5.106.5.3.5 [N] Future charging spaces.** Future charging spaces qualify as designated parking as described in Section 5.106.5.2 Designated parking for clean air vehicles.~~