CHAPTER 4
RESIDENTIAL MANDATORY MEASURES

This chapter discusses select mandatory requirements in the 2019 *CALGreen*. Sections and items that include general information (e.g., scope, definitions, and informational notes) are omitted.

The 2019 *CALGreen* becomes effective on January 1, 2020.

Division 4.1 – PLANNING AND DESIGN

SECTION 4.106
SITE DEVELOPMENT

4.106.1 General. Preservation and use of available natural resources shall be accomplished through evaluation and careful planning to minimize negative effects on the site and adjacent areas. Preservation of slopes, management of storm water drainage and erosion controls shall comply with this section.

4.106.2 Storm water drainage and retention during construction. Projects which disturb less than one acre of soil and are not part of a larger common plan of development which in total disturbs one acre or more, shall manage storm water drainage during construction. In order to manage storm water drainage during construction, one or more of the following measures shall be implemented to prevent flooding of adjacent property, prevent erosion and retain soil runoff on the site.

1. Retention basins of sufficient size shall be utilized to retain storm water on the site.
2. Where storm water is conveyed to a public drainage system, collection point, gutter, or similar disposal method, water shall be filtered by use of a barrier system, wattle or other method approved by the enforcing agency.

3. Compliance with a lawfully enacted storm water management ordinance.

Note: Refer to the State Water Resources Control Board for projects which disturb one acre or more of soil, or are part of a larger common plan of development which in total disturbs one acre or more of soil.

(Website:http://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.shtml)

COMMENTARY

PURPOSE

Implementation of this standard is intended to help prevent flooding, damage to adjacent property and pollution from storm water runoff, by retaining soil on-site or by providing soil containment methods to prevent sediment from reaching storm water drainage systems and receiving creeks, streams, rivers, and lakes or the ocean.

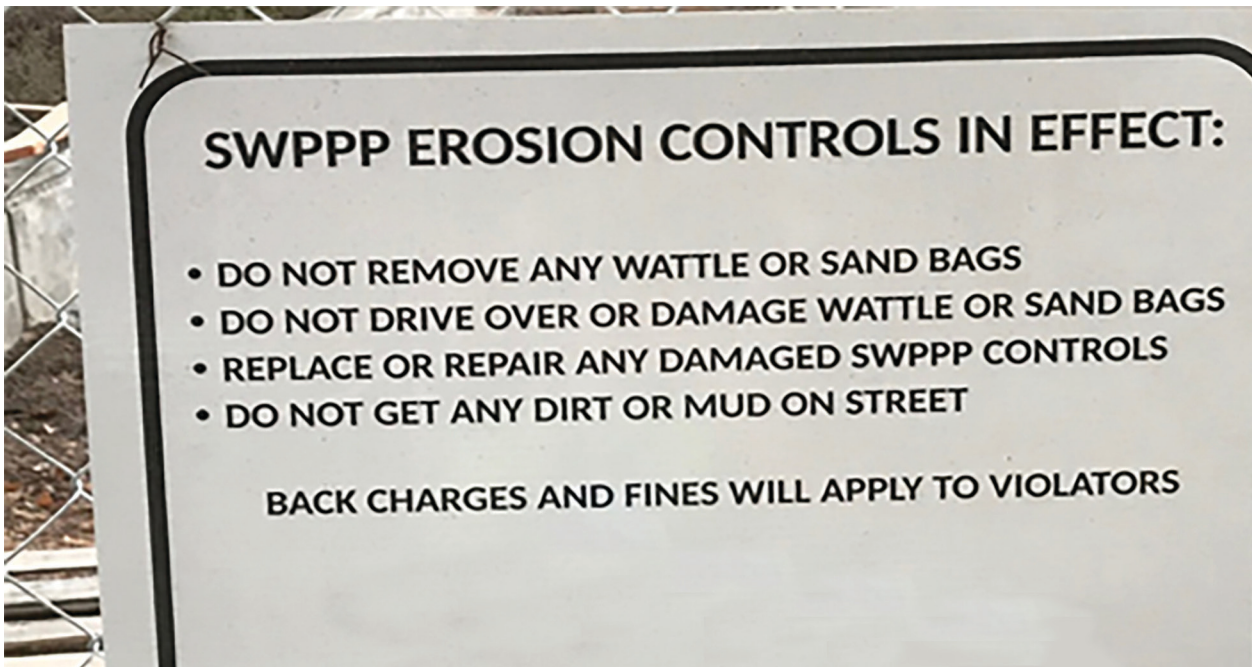

Figure 1 State Housing Law Program staff photo: Notification sign for projects one acre or larger and addressed by a Storm Water Pollution Prevention Plan (SWPPP).

EXAMPLES OF ACCEPTABLE METHODS OF IMPLEMENTATION AND/OR COMPLIANCE

- Retention basins sized and shown on the site plan.
- Filtering storm water and routing to a public drainage system.
- Compliance with local storm water ordinances.
- Develop and implement additional best management practices (BMPs), including, but not limited to:
  - Silt fencing.
  - Hay bales/mulch.

- Cutback curbs.
- Erosion control matting.
- Inlet protectors.
- Stabilized entrances.
- Sand/gravel bags.
- Fiber rolls/wattles.

BACKGROUND

Currently, the California State Water Resources Control Board (SWRCB) issues permits to ensure a Storm Water Pollution Prevention Plan (SWPPP) in compliance with applicable state regulations is issued and implemented for projects that are larger than 1 acre. This section applies only to construction projects less than 1 acre, which are outside the scope of SWRCB.

Storm water runoff and the sediment and pollutants it may contain have been identified as one of the biggest polluters to water bodies and their health. Construction sites that continually receive heavy equipment and truck traffic, utility excavation and exposure to storm water often experience compaction and topsoil loss which, unless contained, can allow soil and contaminants to migrate into downstream water bodies.

The goal of storm water management is to create an effective combination of erosion and sediment controls. Erosion control is the practice of keeping soil from dislodging and migrating from its resting place. Sediment control refers to trapping and containing soil particles after they have been dislodged by storm water or water used during construction. Erosion can be considered the process and sediment as the result.

BMPs continually evolve as on-site activities change from land development to homebuilding. During land development the site perimeter is the main focus of protection. As activities move to homebuilding the interior streets and catch basins become the main focus of protection. BMPs should be implemented to prevent soil erosion, prevent pollution from mixing with storm water, and to trap pollutants before they can be discharged.

HCD added a “note” to Section 4.106.2 that refers the code user to the State Water Resources Control Board’s website for construction storm water regulations.

4.106.3 Grading and paving. Construction plans shall indicate how the site grading or drainage system will manage all surface water flows to keep water from entering buildings. Examples of methods to manage surface water include, but are not limited to, the following:

1. Swales
2. Water collection and disposal systems
3. French drains
4. Water retention gardens
5. Other water measures which keep surface water away from buildings and aid in groundwater recharge.

Exception: Additions and alterations not altering the drainage path.

COMMENTARY

PURPOSE

This section provides protection from unintended entry of surface water and requires construction plans to show how surface water will be managed. Site design and proper installation of drainage systems will help builders protect structures from the dangers of flooding or subsurface water infiltration. This is especially important in areas where setbacks or obstacles interfere with proper surface drainage.

EXAMPLES OF ACCEPTABLE METHODS OF IMPLEMENTATION AND/OR COMPLIANCE

- Develop and implement control methods to address groundwater flow both above and below the surface to ensure water flow away from the building.
- Channel rain gutter discharge away from the building during large or intense rain events. Builders should consider site design mimicking water flows similar to the natural environment.
- Additional design strategies that can be considered are:
  - Sloped ground surfaces.
  - Properly placed drains.
- This section does not apply to additions and alterations that do not alter the drainage path of the existing building.

BACKGROUND

During large rain events the ground can become saturated causing runoff and/or ponding in low-lying areas, which can cause water to migrate into buildings. It is critically important to channel rain gutter discharge away from the building during these events. Builders should consider site design that mimics water flows similar to the natural environment and incorporate methods as described in this section.

In order to keep a site well drained and stable, designers and contractors should consider both storm water from the roof and rainwater penetrating into the area around the site. Groundwater can flow above or below the surface. Control methods should be developed and implemented which allow for both types of groundwater flow to ensure water can continually flow away from the building.

Frequently Asked Questions

Q: Do local storm water ordinances require findings and filings with the state?

A: Sometimes. It is best to check with a specific local municipality about the local ordinance adoption process and required resolutions, findings and filings. Local charters typically address procedures for adopting, amending and rescinding ordinances. Local ordinances typically require or prohibit certain actions under specified circumstances and include statements of intent, findings, specific actions required or prohibited, and an adoption clause. Approved ordinances are subsequently incorporated into the county or city codes.

The State Water Resources Control Board (SWRCB), through the Municipal Storm-water Program, regulates storm water discharges from municipal separate storm sewer systems (MS4s). Although not a formal finding, changes in local ordinances which are helpful to or enhance the local storm water program will need to be reported in the local agency's annual report to the SWRCB. For further information, visit the State Water Resources Control Board website at: https://www.waterboards.ca.gov/water_issues/programs/stormwater/municipal.html

Q: *CALGreen* Section 4.106.2 requires storm water retention and filtering during construction. Does this requirement apply year-round even though construction will occur during nonrainy season months?

A: No. This section provides three methods for compliance; however, more than one method may be required. The third method involves compliance with a local lawfully enacted storm water management ordinance. In addition, the local enforcing agency has the discretion to determine whether these measures are needed based on the potential for storm water impacts during the construction period of the project. However, if there is potential for construction to be postponed or extended beyond the initial planned construction phase, the local enforcing agency may consider requirements for storm water drainage and retention as permit requirements for the project.

The regulatory text for this section has been amended as of July 1, 2018, and for the 2019 code.

4.106.4 Electric vehicle (EV) charging for new construction. New construction shall comply with Section 4.106.4.1, 4.106.4.2, or 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.

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

COMMENTARY

Note: For purposes of discussion, sections related to multifamily dwellings and hotels/motels will be discussed separately from detached one- and two-family dwellings, and townhouses with attached private garages.

PURPOSE

- To encourage and support use of electric vehicles (EVs) as an alternate means of transportation.
- To help reduce the amount of greenhouse gas emissions released into the environment.
- Provide common-sense preinstallation methods with listed raceways or other approved methods dedicated to future expansion and installation of electric vehicle supply equipment (EVSE).
- Two exceptions are provided to address case-by-case situations where EV charging may not be practical: structures without commercial power supply; and where the out-of-pocket cost to the homeowner or developer for additional infrastructure costs (on the utility side of the meter) exceeds $400 per dwelling unit. The second exception addresses cases in which costs are prohibitive and contrary to HCD's mission to safeguard housing affordability and to reduce obstacles to EV use. The third exception is for new Accessory Dwelling Units (ADUs) and Junior Accessory Dwelling Units (JADUs) without parking facilities. Recent changes in ADU and JADU law (Government Code Section 65852.2) do not allow local jurisdictions to require parking for newly constructed ADUs and JADUs if certain conditions are met. Therefore, there is no reason for a requirement for EV spaces to be enforced for new dwelling units without associated parking facilities.

FIGURE 2 State Housing Law Program staff photo: electric vehicle charging station at multifamily residential complex.

BACKGROUND

2010 *CALGreen*

The 2010 *CALGreen* provisions for EV charging were initially developed as voluntary standards in Section A4.106.6. These voluntary standards were developed in response to numerous requests by stakeholders to provide building standards that meet current and future demands for installation of EVSE in single-family residences and in parking facilities of multifamily dwellings. HCD's

initial proposal was largely based upon language provided by the California Air Resources Board (CARB), which favored mandating a 240V/40A hardwired dedicated branch circuit installed in every home for future installation of EVSE. After considerable internal research, additional comment and discussion with other state agencies, stakeholders, manufacturers, enforcing agencies, and the building industry, HCD chose to provide a more reasoned approach offering greater flexibility and consumer choice. This was largely due to market uncertainties, questions regarding utilities infrastructure and not wishing to substantially increase housing costs with rapidly evolving EVSE technology.

CALGreen's voluntary provisions for EVSE were intended to provide low-cost strategies that offer choice and savings in design for the future use of EVs and for homeowners wishing to purchase an electric vehicle necessitating retroactive installation of higher capacity electrical wiring and supply equipment for charging electric vehicles. It was also HCD's intent to monitor and revisit its voluntary EV requirements as more vehicles enter the market in the coming decade and EV charging technology evolves.

2013 *CALGreen* Supplement (effective July 1, 2015)

The 2013 *CALGreen* included "carryover" of voluntary provisions for EV charging from the 2010 *CALGreen*. As part of the 2013 Intervening Code Adoption Cycle, HCD proposed continued adoption of the EV provisions; however, HCD amended the provisions to mandatory measures. This was, in part, to support implementation of the Governor's Executive Order B-16-2012 to achieve a benchmark for having over 1.5 million zero-emission vehicles on California roadways by 2025, and the Governor's October 2013 announcement of an initiative to put 3.3 million zero-emission vehicles on the roadways within a dozen years. (The initiative was a memorandum of understanding signed by the governors of California, Connecticut, Maryland, Massachusetts, New York, Oregon, Rhode Island and Vermont. These states comprise nearly 25 percent of the U.S. vehicle market and the initiative demonstrates commitment to support a successful and growing market for electric vehicles, an important influence on climate change, and to support reducing dependence on oil.) In addition, the Governor's Interagency Working Group on Zero-Emission Vehicles, "2013 ZEV Action Plan," designates HCD as the lead agency for considering amendments to the *California Building Standards Code* to ensure new residential buildings are ZEV-ready and requiring multiunit buildings to dedicate a portion of their parking lots for EV charging.

2016 *CALGreen*

As part of the 2015 Triennial Code Adoption Cycle (2016 *CALGreen*), HCD replaced the term "EV charging stations" with "EV charging spaces," since the term "EV charging space" better described a space available for future installation of EVSE, but with no EV charger installed. This modification in terminology aligned with the terminology used by the Division of State Architect in Chapter 11B of the *California Building Code*. HCD also eliminated the requirement for identification of EV charging spaces on the construction documents because the same requirement was addressed in Section 4.106.4.2.1. There was no reason for the same requirement to be duplicated. These modifications did not change the regulatory effect.

2016 *CALGreen* Supplement (effective July 1, 2018)

The 2016 *CALGreen* included "carryover" of provisions for EV charging infrastructure from the 2013 *CALGreen*. As part of the 2016 Intervening Code Adoption Cycle, HCD included new mandatory EV charging requirements for hotels and motels. The number of parking spaces required to have capability for EV charging mirrored the requirement for non-residential structures in Section 5.106.5.2. The space dimensions, identification and design was similar to the requirements for multifamily charging infrastructure.

2019 *CALGreen* (effective January 1, 2020)

As part of the 2018 Triennial Code Adoption Cycle (2019 *CALGreen*), HCD removed the threshold of 17 or more multifamily dwellings and increased the required number of EV spaces from 3 percent of the total number of parking spaces to 10 percent. HCD also made significant changes to the voluntary provisions for EV charging. Tiers 1 and 2 were separated. Tier 1 increased the required number of EV spaces from 5 percent to 15 percent; Tier 2 increased from 5 percent to 20 percent.

HCD's provisions facilitate EV charging capability at residences to further encourage purchase and use of EVs as a reliable and economical source of transportation and assist in reducing impediments such as lack of access to EV charging. These provisions will result in significant cost savings for homeowners who choose to use EVs for transportation and need to retroactively install higher capacity electrical wiring and supply equipment for charging EVs. The provisions also provide cost savings for state agencies that may need to offer incentive funding, such as the CEC's Alternative and Renewable Fuel and Vehicle Technology Program for accommodating user needs for electrical upgrades for purposes of EV charging.

Charging Levels

The amount of time required to fully charge an electric vehicle is a function of battery size and the amount of kilowatts (kW) that an electrical circuit can deliver to the battery. Larger circuits, as measured by voltage and amperage, will deliver more kW. EV charging is performed at three voltage and current levels. The levels are defined to meet the current EVs and anticipated future technology needs, and to provide compatibility with the nation's electric transmission and distribution system. Following are general descriptions of EV charging levels; however, it is expected that technology will be changing over the next several years. (For purposes of discussion, the terms "electric vehicle supply equipment" or "EVSE" are used interchangeably with "off-board charger.")

Level 1 (AC Level 1)

This method uses a standard 120V branch circuit, which is the lowest common voltage level found in both residential and commercial buildings. Typical ratings for these circuits and circuit breakers are 15A or 20A. Level 1 EVSE typically uses a standard 3-prong electrical outlet to connect to premises wiring. Most, if not all, EVs are supplied with a Level 1 cord-connected portable charger with a J1772 standard connector to the EV. The charging time with Level 1 EVSE can be very long—more than 20 hours for some batteries needing a full charge.

Level 2 (AC Level 2)

Level 2 is typically described as the "primary" or "preferred" method for both private and publicly available facilities. Level 2 uses a single-phase 240V branch circuit and appropriate receptacle (as per the current). The J1772 connector allows for current as high as 80A (100A rated circuit). The higher voltage and current of Level 2 allows for a much faster battery charge. There are many specifics affecting the charging time—such as size of the battery, size of the charging equipment, efficiency of the charging equipment, etc. Typically, the charging time for most vehicles currently on the market with a standard Level 2 charger is between 6 and 8 hours.

DC (Direct Current) Fast Charging

DC fast charging is designed for commercial and public applications and is intended to perform in a manner similar to a commercial gasoline service station—which is rapid recharge. Typically, DC fast charge would provide 50–80 percent recharge in 10 to 15 minutes. DC fast charge uses an off-board charger to provide the AC to DC conversion. The vehicle's on-board battery management system controls the off-board charger to deliver DC directly to the battery. This off-board charger is serviced by a three-phase circuit at 208, 240V, 480, or 600V. DC fast