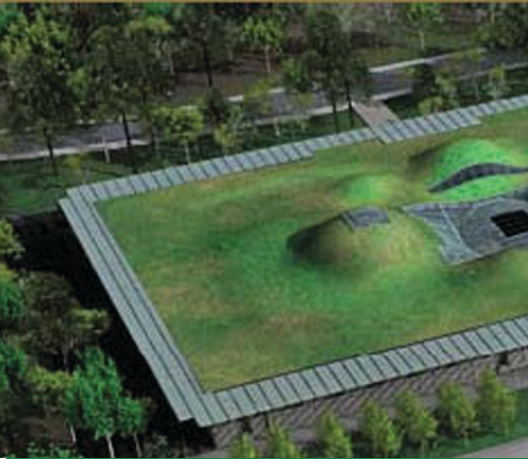


# CHAPTER 5 NONRESIDENTIAL MANDATORY MEASURES



This chapter discusses mandatory requirements for nonresidential structures in the 2019 *CALGreen* Code. Sections and items that include general information (Matrix Adoption Tables, general titles, definition lists, and reserved sections) have been omitted. Certain reference tables have also been omitted.

**Suggestion:** Refer to Chapter 8 for *CALGreen* compliance forms, worksheets and reference material which includes commissioning referenced standards for non-energy systems.

It is important that code users reference the appropriate version of *CALGreen*, including any errata or supplements from emergency or intervening code adoption cycles. Additionally, code users should be aware of lawfully enacted local amendments (ordinances) that may require more restrictive green building standards.

## **Items to consider when reviewing the mandatory provisions in Chapter 5.**

1. This chapter is designed to explain provisions of the *CALGreen* Code that apply to common nonresidential occupancies (Groups A, B, I, L and M) subject to building code enforcement by the local building department. Mandatory measures that are adopted by DSA and pertain to public elementary and secondary schools and community colleges have been omitted from this chapter.
2. This chapter provides a reprint of only those 2019 *CALGreen* Code sections pertinent for discussion.
3. To identify the adoption and application of the code provisions, refer to the Matrix Adoption Tables in the *CALGreen* Code.
4. Calculations to determine numbers of mandatory items shall be rounded up to the nearest whole number.

## ***Division 5.1—PLANNING AND DESIGN***

### **SECTION 5.101 GENERAL**

**5.101.1 Scope.** The provisions of this chapter outline planning, design and development methods that include environmentally responsible site selection, building design, building siting and development to protect, restore and enhance the environmental quality of the site and respect the integrity of adjacent properties.

### **SECTION 5.102 DEFINITIONS**

**Note:** All definitions may be found in Chapter 2 of *CALGreen*.

### **SECTION 5.106 SITE DEVELOPMENT**

**5.106.1 Stormwater pollution prevention for projects that disturb less than one acre of land.** Newly constructed projects and additions which disturb less than one acre of land and are not part of a larger common plan of development or sale shall prevent the pollution of stormwater runoff from the construction activities through one or more of the following measures:

**5.106.1.1 Local ordinance.** Comply with a lawfully enacted stormwater management and/or erosion control ordinance.

**5.106.1.2 Best management practices (BMP's).** Prevent the loss of soil through wind or water erosion by implementing an effective combination of erosion and sediment control and good housekeeping BMP's.

1. Soil loss BMP that should be considered for implementation as appropriate for each project include, but are not limited to, the following:
  - a. Scheduling construction activity during dry weather, when possible.
  - b. Preservation of natural features, vegetation, soil, and buffers around surface waters.
  - c. Drainage swales or lined ditches to control stormwater flow.
  - d. Mulching or hydroseeding to stabilize disturbed soils.
  - e. Erosion control to protect slopes.
  - f. Protection of storm drain inlets (gravel bags or catch basin inserts).
  - g. Perimeter sediment control (perimeter silt fence, fiber rolls).
  - h. Sediment trap or sediment basin to retain sediment on site.
  - i. Stabilized construction exits.
  - j. Wind erosion control.
  - k. Other soil loss BMP's acceptable to the enforcing agency.

2. Good housekeeping BMP's to manage construction equipment, materials, non-stormwater discharges, and wastes that should be considered for implementation as appropriate for each project include, but are not limited to, the following:
  - a. Dewatering activities.
  - b. Material handling and waste management.
  - c. Building materials stockpile management.
  - d. Management of washout areas (concrete, paints, stucco, etc.).
  - e. Control of vehicle/equipment fueling to contractor's staging area.
  - f. Vehicle and equipment cleaning performed off site.
  - g. Spill prevention and control.
  - h. Other housekeeping BMP's acceptable to the enforcing agency

## **INTENT:**

The intent of this requirement is to prevent the loss of soil through wind or water erosion by implementing effective combination of erosion and sediment control and good housekeeping Best Management Practices (BMPs).

**Note:** A sample checklist of BMPs and self-certification forms are found in Chapter 8 of this guide.

**Change for 2019:** No changes were made during the 2018 Triennial Code Adoption Cycle. Sections 5.601 and 5.601.2 were amended during the 2016 Intervening Code Adoption Cycle to clarify which code sections apply to projects that disturb less than one acre. Additionally, the body of the paragraph was amended to add verbiage to clarify that the code section applies to projects that disturb less than one acre and are not part of a larger common plan of development or sale. This amendment was necessary to alert the code user that it is possible to trigger a State Water Resources Control Board's National Pollutant Discharge Elimination System (NPDES) General Permit, even if your project disturbs less than one acre of land but is part of a larger common plan of development.

Other amendments include updating the soil loss BMPs by adding preservation of "buffers around surface waters" during construction and adding "non-stormwater discharges" as well as "dewatering activities" to the good housekeeping Best Management Practices list.

These amendments make *CALGreen* consistent with the objectives of the California Water Action Plan 2016 Update, Water Smart Landscapes recommendations by the California Urban Water Conservation Council, and the State Water Resources Control Board's National Pollutant Discharge Elimination System General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit).

## **COMPLIANCE METHOD:**

Indicate on the construction documents methods used to comply with the preceding requirements. One of the following must be indicated in the construction documents:

- How a local stormwater management ordinance is being met;
- The BMP that will be employed, specific to the site and season of construction;
- Stormwater Pollution Management Plan requirements listed;
- Delegation of stormwater control measures to the contractor for his or her separate submittal to the enforcing agency prior to commencement of excavation and grading; or
- A descriptive method deemed acceptable to the enforcing agency.

**Contractor:** No grading should be done until site and season-specific soil loss and housekeeping stormwater BMP have been approved by the enforcing agency. The contractor should employ the design BMP and any other control measure, as the need arises. The contractor should also conduct site inspections before, during and after each extended storm event in order to identify conditions that may contribute to erosion and sediment problems or any other pollutant discharges. If additional control measures are needed, the contractor should implement them immediately.

## **ENFORCEMENT:**

**Plan intake:** The plan reviewer should make sure that the stormwater pollution prevention BMP meets the regulations or local requirements. The BMP may be included with the construction documents (plans and/or specifications) or submitted separately.

**On-site enforcement:** The inspector should check the erosion and sediment controls for conformance with the BMP during the normal inspection process. A separate inspection may be deemed appropriate by the enforcing agency. Additional site inspections may be required during extended storm events to verify mitigation measures.

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**5.106.2 Stormwater pollution prevention for projects that disturb one or more acres of land.** Comply with all lawfully enacted stormwater discharge regulations for projects that (1) disturb one acre or more of land, or (2) disturb less than one acre of land but are part of a larger common plan of development or sale.

**Note:** Projects that (1) disturb one acre or more of land, or (2) disturb less than one acre of land but are part of a larger common plan of development or sale must comply with the post-construction requirements detailed in the applicable National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities issued by the State Water Resources Control Board or the Lahontan Regional Water Quality Control Board (for projects in the Lake Tahoe Hydrologic Unit).

The NPDES permits require post-construction runoff (post-project hydrology) to match the pre-construction runoff (pre-project hydrology) with the installation of post-construction stormwater management measures. The NPDES permits emphasize runoff reduction through on-site stormwater use, interception, evapotranspiration, and infiltration through non-structural controls, such as Low Impact Development LID practices, and conservation design measures. Stormwater volume that cannot be addressed using non-structural practices is required to be captured in structural practices and be approved by the enforcing agency.

Refer to the current applicable permits on the State Water Resources Control Board website at: [www.waterboards.ca.gov/constructionstormwater](http://www.waterboards.ca.gov/constructionstormwater). Consideration to the stormwater runoff management measures should be given during the initial design process for appropriate integration into site development.

## **INTENT:**

The intent of this code section reference is to alert the code user of two specific state permitting

requirements for projects that disturb one or more acres of land, and in some cases even projects that disturb less than one acre but are part of a larger common plan of development or sale. These permitting requirements are administered by the State Water Resources Control Board (SWRCB) and are not a requirement in the *CALGreen* Code to be administered by the local enforcing agencies.

**Change for 2019:** No changes were made during the 2018 Triennial Code Adoption Cycle. However, a new nonregulatory code section, Section 5.601.2, was added during the 2016 Intervening Code Adoption Cycle to alert the code user of existing permitting requirements administered by the SWRCB that are triggered when a new site over one acre is disturbed or when a new site disturbs less than one acre of land but is part of a larger common plan of development or sale. By referencing the stormwater management requirements in *CALGreen*, the State Water Resources Control Board aims to improve awareness of modern stormwater management among design professionals, such as engineers and architects, involved in the design phase for construction projects, resulting in enhanced on-site retention and infiltration where stormwater is used as a resource to aid in the mitigation of climate change effects and increase municipal water supply sources. Additionally, knowing of these permit requirements prior to starting the initial project design process benefits developers by avoiding costly post-design revisions and/or construction change orders, if the permit requirements are not included in the initial design.

## COMPLIANCE METHOD:

If a project consists of a site that meets the criteria listed in Section 5.106.2, obtain the appropriate NPDES permit. Refer to the current applicable permit requirements on the State Water Resources Control Board website at: [www.waterboards.ca.gov/constructionstormwater](http://www.waterboards.ca.gov/constructionstormwater)

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**5.106.4 Bicycle parking.** For buildings within the authority of California Building Standards Commission as specified in Section 103, comply with Section 5.106.4.1. For buildings within the authority of the Division of the State Architect pursuant to Section 105, comply with Section 5.106.4.2.

**5.106.4.1 Bicycle parking.** [BSC-CG] Comply with Sections 5.106.4.1.1 and 5.106.4.1.2; or meet the applicable local ordinance, whichever is stricter.

**5.106.4.1.1 Short-term bicycle parking.** If the new project or an addition or alteration is anticipated to generate visitor traffic, provide permanently anchored bicycle racks within 200 feet of the visitors' entrance, readily visible to passers-by, for 5 percent of new visitor motorized vehicle parking spaces being added, with a minimum of one two-bike capacity rack.

**Exception:** Additions or alterations which add nine or less visitor vehicular parking spaces.

**5.106.4.1.2 Long-term bicycle parking.** For new buildings with tenant spaces that have 10 or more tenant-occupants or for additions or alterations that add 10 or more tenant vehicular parking spaces, provide secure bicycle parking for 5 percent of the tenant-occupant vehicular parking spaces being added, with a minimum of one vehicle parking facility.

**5.106.4.1.3** For additions or alterations that add 10 or more tenant-occupant vehicular

parking spaces, provide secure bicycle parking for 5 percent of the tenant vehicular parking spaces being added, with a minimum of one bicycle parking facility.

**5.106.4.1.4** For new shell buildings in phased projects provide secure bicycle parking for 5 percent of the anticipated tenant-occupant vehicular parking spaces with a minimum of one bicycle parking facility.

**5.106.4.1.5** Acceptable parking facilities shall be convenient from the street and shall meet one of the following:

1. Covered, lockable enclosures with permanently anchored racks for bicycles;
2. Lockable bicycle rooms with permanently anchored racks; or
3. Lockable, permanently anchored bicycle lockers.

**Note:** Additional information on recommended bicycle accommodations may be obtained from Sacramento Area Bicycle Advocates.

## **INTENT:**

The intent of this code provision is to promote the use of bicycles as an alternative means of transportation by ensuring that newly constructed projects or additions and alterations provide short-term and/or long-term bicycle parking accommodations. This goal aligns with California's aggressive efforts to reduce greenhouse gas emissions, which are intended to improve the state's air quality and promote bicycle use as a means of alternative transportation.

**Change for 2019:** No changes were made during the 2018 Triennial Code Adoption Cycle. However, during the 2015 Triennial Code Adoption Cycle, the BSC banner was replaced in Section 5.106.4.1 with the new BSC-CG banner, which was added throughout *CALGreen* and other parts of Title 24 as an indicator of *CALGreen* requirements adopted by BSC. The BSC-CG banner applies to all occupancies for which no state agency has the authority or expertise to propose green building standards. The use of this banner is helpful in identifying the Division of the State Architect's DSA-SS specific bicycle parking requirements for public schools found within this code section.

Subsequently during the 2016 Intervening Code Adoption Cycle amendments to Section 5.106.4.1.2 were made to clarify that the application for long-term bicycle parking is triggered when new buildings with tenant spaces that have 10 or more tenant-occupants occupying an individual tenant space and to separate the additions and alterations into their own separate code section. Section 5.106.4.1.3 was added for additions and alterations to clearly define the specific requirements. Section 5.106.4.1.4 was added for new shell buildings in phased projects and Section 5.106.4.1.5. is was amended to clarify the requirements of the new added code sections.

These amendments will add clarity for the code user and local enforcing agencies by creating a clear distinction between new construction, additions and alterations and shell buildings in phased projects which will aid in user interpretation and local agency enforcement.

## **COMPLIANCE METHOD:**

### **Short-term bicycle parking:**

1. Determine if the new project or addition or alteration is anticipated to generate visitor traffic.  
or;



2. Determine if the exception for additions and alterations applies.

If *CALGreen* applies, then:

Provide construction documents (plans and specifications and/or site plan) that show the location of the required number of short-term, permanently anchored bicycle parking racks. The number of bicycle racks is calculated at 5 percent of the visitor motorized vehicle parking spaces, and where applicable, additions and alterations, with a minimum of one two-bike capacity rack.

**Long-term bicycle parking:**

1. Determine if the new building has tenant spaces that have 10 or more tenant-occupants. or;
2. Determine if the addition and alteration applies. or;
3. Determine if the building is a new shell building in a phased project.

If *CALGreen* applies, then:

Determine which of the three options from Section 5.106.4.1.5 will be used to comply.

Provide construction documents (plans and specifications and/or site plan) that show the method and location of the required number of long-term, secured bicycle parking facilities for 5 percent of the tenant vehicle parking spaces being added, with a minimum of one bicycle parking facility.

Note: If the code user is seeking a parking capacity reduction under Section A5.106.6 or the local jurisdiction has a zoning ordinance for reducing parking; use the original parking capacity calculation to determine the required number of bicycle racks. This is to ensure that the required number of bicycle racks is not reduced as a result of the tier option selection.

**SUGGESTION:**

Provide a calculation table or a note on the plans showing the total number of required bicycle racks for either short-term or long term bicycle storage as applicable.

**EXAMPLES:**

**Short-term:** Visitor motorized parking spaces at 42 x 5 percent = 2.1. Provide racks for three bicycles.

**Long-term:** Total tenant vehicular parking spaces at 216 x 5 percent = 10.8.

Provide 11 secure bicycle parking facilities by using one of the three methods allowed in Section 5.106.4.1.5.

If specifying lockers, consider using six two-bicycle lockers for long-term bicycle parking.

**ENFORCEMENT:**

**Plan intake:** The plan reviewer should review the plans and confirm that the correct number of bicycle parking racks and/or secured areas is included with the drawings and that they meet the requirements.

**On-site enforcement:** The inspector should verify that all required bicycle parking requirements shown on the plans have been provided and installed.

**5.106.5.2 Designated parking for clean air vehicles.** In new projects or additions or alterations that add 10 or more vehicular parking spaces, provide designated parking for any combination of low-emitting, fuel-efficient and carpool/van pool vehicles as follows:

**TABLE 5.106.5.2**

TOTAL NUMBER OF PARKING SPACES	NUMBER OF REQUIRED SPACES
0–9	0
10–25	1
26–50	3
51–75	6
76–100	8
101–150	11
151–200	16
201 and over	At least 8 percent of total

**5.106.5.2.1 Parking stall marking.** Paint, in the paint used for stall striping, the following characters such that the lower edge of the last word aligns with the end of the stall striping and is visible beneath a parked vehicle:

**CLEAN AIR / VANPOOL / EV**

**Note:** Vehicles bearing Clean Air Vehicle stickers from expired HOV lane programs may be considered eligible for designated parking spaces.

**INTENT:**

The intent of these requirements is to enhance the appeal of driving clean air vehicles in an effort to reduce greenhouse gas emissions. This code ensures that newly constructed projects or additions and alterations provide designated parking for clean air vehicles (e.g., low-emitting, fuel-efficient and carpool/vanpool vehicles).

**COMPLIANCE METHOD:**

**Design team:** The construction documents and/or site plan should indicate the location and required number of designated parking stalls. These parking spaces should be marked “CLEAN AIR/VANPOOL/EV.” The markings should be visible when a clean air vehicle is parked. In other words, if the front of the vehicle goes into the parking stall first, the markings should be visible at the back end of the vehicle. Lettering should be at least 8 inches high. The CLEAN AIR/VANPOOL/ EV parking stalls may be located anywhere on the site and do not require a preferential location.

However, take into consideration the location of stalls that are designated for future EV stalls because once charging units are installed the charging spaces will need to comply with Chapter 11B accessibility requirements.



## SUGGESTION:

The plans should reflect the total number of required motor vehicle parking spaces. Refer to Table 5.106.5.2 in *CALGreen* to ensure that the correct number of designated parking stalls is provided. Include all parking spaces in the calculation. As approved by the enforcing agency, some compact stalls may also be marked for clean air vehicles.

## EXAMPLES:

1. **If a parking lot contains 55 total parking spaces:** Based on Table 5.106.5.2., provide six clean air vehicle spaces, with required stall markings, which fall within the range.
2. **If a parking lot contains 240 total parking spaces:** Based on Table 5.106.5.2, calculate  $240 \times 8 \text{ percent} = 19.2$ . Provide 20 clean air vehicle spaces with required stall markings.

## ENFORCEMENT:

**Plan intake:** The plan reviewer should review the plans and confirm that the correct number of “CLEAN AIR/VANPOOL/EV” parking stalls is included on the drawings.

**On-site enforcement:** The inspector should verify that the correct number of clean air vehicle parking stalls have been installed and are accurately identified.

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**5.106.5.3 Electric vehicle (EV) charging. [N]** Construction shall comply with Section 5.106.5.3.1 or Section 5.106.5.3.2 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:

**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.

**5.106.5.3.3 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.

**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, may adversely impact the construction cost of the project.

**TABLE 5.106.5.3.3**

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 <sup>1</sup>

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

**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 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.

**INTENT:**

The intent of these requirements is to facilitate Electric Vehicle (EV) charging capability by installing raceways for future electric vehicle supply equipment (EVSE) at the time of new building construction. Construction plans and specifications must reflect that the infrastructure will be capable of supporting future electrical demands. Having the infrastructure pre-installed will allow the charging stations to be easily added at a later date. This will aid in achieving an interim goal for infrastructure that will support 5 million zero emissions vehicles (ZEV’s) on California roadways by 2030 as directed by executive order EO B-48-18.

**Note:** This EVSE capable requirements are intended for new construction as in a new building on a new or existing site with new or existing parking stalls and is not triggered for additions or alterations to existing buildings or to existing parking lots.

## **SUGGESTIONS:**

Anticipate accessibility requirements where EV charging stations are installed per the *California Building Code*, Part 2, Chapter 11B. Locate the EVSE stalls near the entrance to the building and in a parking area that can easily accommodate compliance with accessibility regulations once the EVSE chargers are installed.

**Change for 2019:** During the 2018 Triennial Code Adoption Cycle, Section 5.106.5.3.5 was amended to add the title “Future charging spaces”. Additionally, notes 1 through 3 were repealed. The guide was also amended to add clarity for the intended application of EVSE requirement intent for new buildings at new or existing parking lots and not applicable for building additions or alteration at existing parking lots. During the 2015 Triennial Code Adoption Cycle, the percent of parking spaces that must install electric vehicle (EV) charging infrastructure to support future installation of EVSE was increased from 3 percent to 6 percent and the parking lot size threshold decreased from 51 spaces to 10 spaces.

## **COMPLIANCE METHOD:**

Include on the site plan the proposed location of the listed suitable cabinet(s), box(es), enclosure(s) or equivalent required for future EV equipment connections. Indicate on the plans the 40-amp minimum service panel capacity with raceway to the approximate location of the future EV charging connections as required in the code Section 5.106.5.3. Use Table 5.106.5.3.3 to determine if single or multiple charging space requirements apply for the future installation of EVSE. Lastly, ensure that the service panel or subpanel(s) circuit directory is properly identified as being “EV CAPABLE” and that the raceway termination location is permanently and visibly marked as “EV CAPABLE.”

## **RECOMMENDATION:**

The plans should reflect the EV capacity needed to accommodate the total number of required future EV vehicular charging spaces as required per Table 5.106.5.3.3. Include all parking spaces in the calculation when determining the required EV capacity for future installation.

## **SUGGESTION:**

Refer to the access provisions for EVCS found in the *California Building Code*, Chapter 11B when designing the EV Capable charging spaces in new parking lots. Designing the EV Capable charging spaces in new parking lots to meet size requirements for accessibility can reduce complications when EV charging stations are installed at a future date.

## **EXAMPLES:**

1. **Assume 55 total actual parking spaces:** Based on Table 5.106.5.3.3, provide capacity for four future EV charging spaces.

2. **Assume 240 total actual parking spaces:** Based on Table 5.106.5.3.3, calculate  $240 \times 6$  percent = 14.4. Provide capacity for 15 future EV charging spaces.

## **ENFORCEMENT:**

**Plan intake:** The plan reviewer should confirm that the construction documents are compliant with Sections 5.106.5.3.1 or 5.106.5.3.2, and 5.106.5.3.3 and 5.106.3.4 as applicable and that the appropriate EV capacity for future EV connection to the required number of future EV charging spaces per Table 5.106.5.3.3 has been provided. Confirm proper identification at the service panel or subpanel(s) and that the raceway termination location is permanently and visibly marked as “EV CAPABLE.”

**On-site enforcement:** The inspector should verify on-site that the service panel and raceway with proper termination have been installed per the approved set of construction documents.

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**5.106.8 Light pollution reduction.** [N] Outdoor lighting systems shall be designed and installed to comply with the following:

1. The minimum requirements in the *California Energy Code* for Lighting Zones 1-4 as defined in Chapter 10, Section 10-114 of the *California Administrative Code*; and
2. Backlight (B) ratings as defined in IES TM-15-11 (shown in Table A-1 in chapter 8);
3. Uplight and Glare ratings as defined in *California Energy Code* (shown in Tables 130.2-A and 130.2-B in Chapter 8); and
4. Allowable BUG ratings not exceeding those shown in Table 5.106.8 [N], or

Comply with a local ordinance lawfully enacted pursuant to Section 101.7, whichever is more stringent.

**Exceptions: [N]**

1. Luminaires that qualify as exceptions in Section 140.7 of the *California Energy Code*.
2. Emergency lighting.
3. Building facade meeting the requirements in Table 140.7-B of the *California Energy Code*, Part 6.
4. Custom lighting features as allowed by the local enforcing agency, as permitted by Section 101.8 Alternate materials, designs and methods of construction.

**Notes:**

1. [N] See also *California Building Code*, Chapter 12, Section 1205.7 for college campus lighting requirements for parking facilities and walkways.
2. Refer to Chapter 8 (Compliance Forms, Worksheets and Reference Material) for IES TM-15-11 Table A- 1, *California Energy Code* Tables 130.2-A and 130.2-B.
3. Refer to the *California Energy Code* for requirements for additions and alterations.

**TABLE 5.106.8 [N]  
MAXIMUM ALLOWABLE BACKLIGHT, UPLIGHT AND GLARE (BUG) RATINGS<sup>1,2</sup>**

ALLOWABLE RATING	LIGHTING ZONE LZ0	LIGHTING ZONE LZ1	LIGHTING ZONE LZ2	LIGHTING ZONE LZ3	LIGHTING ZONE LZ4
<b>Maximum Allowable Backlight Rating<sup>3</sup> (B)</b>					
Luminaire greater than 2 mounting heights (MH) from property line	N/A	No Limit	No Limit	No Limit	No Limit
Luminaire back hemisphere is 1 – 2 MH from property line	N/A	B2	B3	B4	B4
Luminaire back hemisphere is 0.5 – 1 MH from property line	N/A	B1	B2	B3	B3
Luminaire back hemisphere is less than 0.5 MH from property line	N/A	B0	B0	B1	B2
<b>Maximum Allowable Uplight Rating (U)</b>					
For area lighting <sup>4</sup>	N/A	U0	U0	U0	U0
For all other outdoor lighting, including decorative luminaires	N/A	U1	U2	U3	U4
<b>Maximum Allowable Glare Rating<sup>5</sup> (G)</b>					
Luminaire greater than 2 MH from property line	N/A	G1	G2	G3	G4
Luminaire front hemisphere is 1 – 2 MH from property line	N/A	G0	G1	G1	G2
Luminaire front hemisphere is 0.5 – 1 MH from property line	N/A	G0	G0	G1	G1
Luminaire front hemisphere is less than 0.5 MH from property line	N/A	G0	G0	G0	G1

1. IESNA Lighting Zones 0 and 5 are not applicable; refer to Lighting Zones as defined in the California Energy Code and Chapter 10 of the California Administrative Code.
2. For property lines that abut public walkways, bikeways, plazas and parking lots, the property line may be considered to be 5 feet beyond the actual property line for purpose of determining compliance with this section. For property lines that abut public roadways and public transit corridors, the property line may be considered to be the centerline of the public roadway or public transit corridor for the purpose of determining compliance with this section.
3. If the nearest property line is less than or equal to two mounting heights from the back hemisphere of the luminaire distribution, the applicable reduced Backlight rating shall be met.
4. General lighting luminaires in areas such as outdoor parking, sales or storage lots shall meet these reduced ratings. Decorative luminaires located in these areas shall meet U-value limits for “all other outdoor lighting.”
5. If the nearest property line is less than or equal to two mounting heights from the front hemisphere of the luminaire distribution, the applicable reduced Glare rating shall be met.

## INTENT:

Light pollution is disruptive to the environment, wildlife and humans. The intent of this requirement is to minimize light pollution in an effort to maintain dark skies and to ensure that newly constructed projects reduce the amount of backlight, uplight, and glare (BUG) from not-in-code exterior light sources.

**Change for 2019:** Changes for the 2018 Triennial Code Adoption Cycle include adding Note 3 that directs the code user to the *California Energy Code* for additions and alterations. During the 2015 Triennial Code Cycle additional exceptions were added for facade lighting and custom lighting features. Subsequently during the 2016 Intervening Code Cycle, additional compliance clarification was provided stating that for backlight ratings code users shall refer to the IESNA standard, and for uplight and glare ratings code users shall use the *California Energy Code* ratings. References to the ratings tables have been added to this code section and the tables with those ratings have been placed in Chapter 8 Compliance Forms, Worksheets and Reference Material in the *CALGreen Code* for ease of use to the code user. Note 2 has been added to direct the code user to Chapter 8 in the *CALGreen Code* for the BUG rating values.