July 1, 2018 Supplement update

Guide to the 2016 California Green Building Standards Code Nonresidential

Effective July 1, 2018

The purpose of this supplement is to provide an update to the *Guide to the 2016 California Green Building Standards Code*-nonresidential to align with regulatory changes that occurred during the 2016 Intervening Code Adoption Cycle to the 2016 California Green Building Standards Code (CALGreen) which become effective July 1, 2018.

The information contained in this document is believe to be accurate; however, it is being provided for informational purposes only and is intended for use only as a guide. It is not a substitute for studying the CALGreen code itself. An online version of the CALGreen Code is available through the California Building Standards Commission website: https://www.dgs.ca.gov/bsc

LEGEND FOR UPDATES TO THE *GUIDE TO THE 2016 CALIFORNIA GREEN BUILDING STANDARDS CODE (the Guide)*

Amendments to the 2016 CALGreen regulatory language appear underlined.

New intent language to support the regulatory change is titled: *Changes for the 2016 Intervening Code.*

[NOTE TO CODE USER]: Italicized text not included within the code sections indicates notes to the code user. Only modified sections are included in this update.

The following is a supplement to pages 21,22 & 23 of the Guide

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 BMPs.

1. Soil loss BMP's that should be considered for implementation as appropriate for each project include but are not limited to, the following:
   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 and soil.
   c. Drainage swales or lined ditches to control stormwater flow.
   d. Mulching or hydroseeding to stabilize disturbed soils, and buffers around surface waters.
   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 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 implanting an effective combination of erosion and sediment control and good housekeeping best management practices (BMP's).

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

***Changes for the 2016 Intervening Code*:** The existing code section was amended to clarify in the code section title that this code provision applies to projects that disturb less than one acre. Additionally, the body of the paragraph is being 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 is needed because it is possible to have a project that disturbs less than one acre of land but because it is part of a larger common plan of development, it would trigger the National Pollutant Discharge Elimination System (NPDES) permit which is more restrictive and is administered by the State Water Resources Control Board.
This section was amended to clarity that this code section only applies to projects that are not required to obtain an NPDES permit for construction activities.

Other amendments include updating the Soil loss BMP's by adding preservation of "buffers around surface waters" during construction and adding "non-stormwater discharges" and "Dewatering activities" to the good housekeeping Best Management Practices list. These amendments will 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 (NPDES) 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 requests listed above. 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;
- A stormwater pollution management plan;
- 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.

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. 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 that there are 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 and are not a requirement in the CALGreen Code to be administered by the local enforcing agencies.

***Changes for the 2016 Intervening Code*:** This is a new non-regulatory code section that was added to alert the code user of existing laws 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 Board aims to improve awareness of modern stormwater management to 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 and increase municipal water supply sources. Additionally, knowing these requirements prior to starting the initial project design process will benefit 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 project consists of a site 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.

The following is a supplement to pages 23, 24 & 25 of the Guide

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, provide secure bicycle parking for 5 percent of the tenant-occupant vehicular parking spaces with a minimum of one bicycle 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 bicycle parking facility for Sections 5.106.4.1.2, 5.106.4.1.3 & 5.106.4.1.4 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 applicable 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.

***Changes for the 2016 Intervening Code*:** During the 2016 Triennial Code Cycle, the BSC banner was replaced in Section 5.106.4.1 with the new BSC-CG banner, which has been added throughout CALGreen 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.

Changes for the 2016 Intervening Code include the amendments to Section 5.106.4.1.2 by clarifying that the application for long-term bicycle parking is triggered when you have 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. This new Section 5.106.4.1.3 is being added for additions and alterations to clearly define the specific requirements. Section 5.106.4.1.4 is being added for new shell buildings in phased projects and Section 5.106.4.1.5. is 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) should reflect 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 reflect 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 reduces 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.

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 as shown on the plans have been provided and installed**.**

The following is a supplement to pages 31 & 32 of the Guide

5.106.8 Light pollution reduction. [N] [BSC-CG] 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 0-4 as defined in Chapter 10, Section 10-114 of the California Administrative Code; and
2. Backlight, 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 130.2B 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
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.

TABLE 5.106.8 [N]
MAXIMUM ALLOWABLE BACKLIGHT, UPLIGHT AND GLARE (BUG) RATINGS[1,2]

ALLOWABLE RATING	LIGHTING ZONE LZ0	LIGHTING ZONE LZ1	LIGHTING ZONE LZ2	LIGHTING ZONE LZ3	LIGHTING ZONE LZ4
Maximum Allowable Backlight Rating[3] (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
Maximum Allowable Uplight Rating (U)					
For area lighting[4]	N/A	U0	U0	U0	U0
For all other outdoor lighting, including decorative luminaires	N/A	U1	U2	U3	U4
Maximum Allowable Glare Rating[5] (G)					
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 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.

Changes for 2016 Intervening Code: During the 2015 Triennial Code Cycle; additional exceptions were added for facade lighting and custom lighting features.
Changes for the 2016 Intervening Code include; additional compliance clarification were provided stating that for Backlight ratings code user shall refer to the IESNA standard and for Uplight and Glare ratings code user 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 for ease of use to the code user.

Compliance method:
Comply with California Energy Commission regulations in California Administrative Code, Part 1, Title 24 and the California Energy Code Part 6 as cited in Section 5.106.8(1). Those standards form a basis upon which to build for the purpose of light pollution reduction. The provisions in Part 1 provide a weighted approach to the project site location, with a project located in the middle of a big city allowed more light to escape than a project at a rural or urban location. Part 6 addresses power and energy efficiency of outdoor lighting. There are exceptions for certain occupancies for lighting power requirements. Voluntary compliance with any or all of the items is encouraged.
Comply with a local dark-skies ordinance, if more stringent than these regulations.
Specify exterior lighting fixtures that meet IESNA TM-15-11 regarding backlight. Rating may not exceed those values shown in Table 5.106.8.

Plan intake: The plan reviewer should confirm the following:

- Construction documents, including exterior light sources, comply with the California Administrative Code, Part 1 and the California Building Code Part 2, and the California Energy Code Part 6 of Title 24;

- Electrical plans and specifications for compliance with building and exterior lighting, including photometric data for perimeter site lighting fixtures; and

- Specifications for any controls to be installed on the project.

On-site enforcement: The inspector should verify that all specified lighting products are installed as shown on the approved construction documents.

The following is a supplement to pages 38 & 39 of the Guide

Division 5.3 - WATER EFFICIENCY AND CONSERVATION
SECTION 5.303
INDOOR WATER USE

5.303.3.2 Urinals….
5.303.3.3 Showerheads. [BSC-CG]

5.303.3.3.1 Single showerhead. Showerheads shall have a maximum flow rate of not more than 1.8 gallons per minute at 80 psi. Showerheads shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Showerheads.

5.303.3.3.2 Multiple showerheads serving one shower. When a shower is served by more than one showerhead, the combined flow rate of all showerheads and/or other shower outlets controlled by a single valve shall not exceed 1.8 gallons per minute at 80 psi, or the shower shall be designed to allow only one shower outlet to be in operation at a time.

Intent:
The intent of this code requirement is to define the maximum allowable flow rates for plumbing fixtures and fittings, which include water closets, urinals and showerheads. The California Energy Commission (CEC) adopts regulations to establish the minimum water flow rates for specified fixtures and fixture fittings in Title 20 of the California Code of Regulations.

In 2015, the CEC adopted emergency regulations, as a result of the Governor's Executive Order B-29-15, lowering specified plumbing fixture flow rates in Title 20 of the California Code of Regulations. In order to align with these appliance efficiency regulations, the California Building Standards Commission, Department of Housing and Community

Development, Division of the State Architect, and Office of Statewide Health Planning and Development promulgated emergency building standards aligning with the plumbing fixture flow rates in Title 20.

***Changes for 2016 Intervening code*:** During the 2016 Triennial Code; the Wall-mounted urinal flow rates were reduced from 0.5 to 0.125 gallons per flush and floor-mounted urinals remain at 0.5 gallons per flush. Then During the 2016 Intervening Code the CBSC amended the flow rates for both single and double showerheads to align with the CEC's Title 20 emergency regulations which established a delayed effective date for single and multiple showerheads to have a maximum flow rate of 1.8 gallons per minute at 80 psi effective July 1, 2018. This amendment changed the flow rates from 2.0 gallons per minute at 80 psi to 1.8 gallons per minute at 80 psi for showerheads.

Compliance Method:
Specify water closets, urinals and showerheads that meet the new amended prescriptive flow rates listed I the code.

Enforcement:

Plan intake: The plan reviewer should review the plans and confirm that water-conserving plumbing fixtures and fittings specified do not exceed the code-required maximum flow rates and that single showerheads or multiple showerheads specified also meet the flow rates and controls as listed in the code.

On-site enforcement: The inspector should verify that the water-conserving plumbing fixtures and fittings specified on the approved plans are installed.

The following is a supplement to page 45 of the Guide

SECTION 5.305
WATER REUSE SYSTEMS

5.305.1 Recycled Water Supply Systems. Recycled water supply systems shall be installed in accordance with Sections 5.305.1.1, 5.3.5.1.2, and the California Plumbing Code.

5.305.1.1 Outdoor Recycled Water Supply Systems. All newly constructed nonresidential developments, where disinfected tertiary recycled water is available from a municipal source to a construction site, shall be provided with both a potable water supply system and a recycled water supply system. The recycled water supply system shall allow the use of reclaimed (recycled) water for aboveground and subsurface irrigation to all landscape irrigation systems.

For the purposes of Section 5.305.1.1, when a recycled water supply pipe is located within 300 feet from a construction site boundary, it shall be considered that reclaimed (recycled) water is available from a municipal source.

Exceptions:

1. Service areas in which the only reclaimed (recycled) water is used for potable purposes, or in which net nonpotable deliveries are anticipated to remain level or decrease as a result of the potable reuse project.

2. Where access to disinfected tertiary recycled water is not feasible and/or cost-efficient, as determined by the Authority Having Jurisdiction in consultation with the recycled water purveyor.

   Note: A city, county, or city and county, in consultation with the recycled water purveyor, may further reduce the area for the mandate to install recycled water supply systems if the recycled water purveyor is unable to accommodate new services or unable to provide uninterruptable service.

3. A potable water supply system is not required for landscape irrigation if the landscape irrigation system is supplied with recycled water at the time of final inspection.

4. Potable water may be used with the recycled water supply system on a temporary basis, as allowed by the Authority Having Jurisdiction in consultation with the recycled water purveyor.

5.305.1.2 Technical Requirements for Outdoor Recycled Water Supply Systems. Recycled water supply systems for outdoor applications shall meet the requirements of this code, and the California Code of Regulations, Title 17, Division 1, Chapter 5, Subchapter 1; Title 22, Division 4, Chapter 3; and Title 23, Division 2, Chapter 2.7, as applicable.

Intent:
The intent of this provision for jurisdictions that have disinfected tertiary recycled water available from a local water purveyor to require the installation of outdoor recycled water supply systems in new nonresidential construction, as specified.

Existing Law or Regulation:
Pursuant to AB 2282 (Gatto, Chapter 606, Statutes of 2014), which added Section 18940.6 to the Health and Safety Code, the legislature mandated that CBSC research, develop, and propose for adoption mandatory recycled water infrastructure standards to be included within the 2016 Intervening Code Supplement. The scope and application of these provisions are limited to jurisdictions that have feasible and cost-efficient access to a water recycling facility.

The 2016 California Plumbing Code has similar provisions in Chapter 15 regarding the installation of recycled water supply systems, including the mandate for recycled water use for outdoor landscape irrigation.

***Changes for the 2016 Intervening code*:** New code sections have been added to Section 5.305 Water Reuse Systems, which was previously a reserved section.

Compliance method:
During the entitlement process, the design team may wish to contact the local building department and/or local water purveyor to determine if the new project is located within a service area that has disinfected tertiary recycled water available from a purveyor, and that Exceptions 1-4 (including the Note in Exception 2) are not applicable. If it is determined that the new project is within a service area with access to recycled water from a purveyor and is not exempt, compliance with the provisions of Section 5.305 is required.

Enforcement:

Plan intake: The reviewer and/or plan checker should review the construction documents to confirm compliance with Sections 5.305.1.1 & 5.305.1.2, as applicable.

On-site enforcement: The inspector should review the permit set of plans and verify on-site that the outdoor recycled water supply system has been designed and installed per the permitted set of construction documents.

The following is a supplement to page 55 through 72 of the Guide

SECTION 5.410
BUILDING MAINTENANCE AND OPERATION

5.410.2 Commissioning. [N] New buildings 10,000 sf and over. For new buildings 10,000 square feet and over, building commissioning shall be included in the design and construction processes of the building project to verify that the building systems and components meet the owner's or owner representative's project requirements. Commissioning shall be performed in accordance with this section by trained personnel with experience on projects of comparable size and complexity. For I-occupancies that are not regulated by OSHPD or for I-occupancies and L-occupancies that are not regulated by the *California Energy Code* Section 100.0 Scope, all requirements in Sections 5.410.2 through 5.410.2.6 shall apply.

Note: For energy related systems under the scope (Section 100) of the *California Energy Code*, including, heating, ventilation, air conditioning (HVAC) systems and controls, indoor lighting systems and controls, as well as water heating systems and controls, refer to *California Energy Code* Section 120.8 for commissioning requirements.

Commissioning requirements shall include:
1. Owner's or owner representative's project requirements.
2. Basis of design.
3. Commissioning measures shown in the construction documents.
4. Commissioning plan.
5. Functional performance testing.

6. Documentation and training.
7. Commissioning report.

Exceptions:

1. Unconditioned warehouses of any size.
2. Areas less than10,000 square feet used for offices or other… conditioned accessory spaces within unconditioned warehouses.
3. Tenant improvements less than 10,000 square feet as described in Section 303.1.1.
4. Open parking garages of any size, or open parking garage areas, of any size, within a structure.

Note: For the purposes of this section, unconditioned shall mean a building, area, or room which does not provide heating and/or air conditioning.

Informational Notes:

1. IAS AC 476 is an accreditation criteria for organizations providing training and/or certification of commissioning personnel. AC 476 is available to the Authority Having Jurisdiction as a reference for qualifications of commissioning personnel. AC 476 does not certify individuals to conduct functional performance tests or to adjust and balance systems.

2. Functional performance testing for heating, ventilation, air conditioning systems and lighting controls must be performed in compliance with the *California Energy Code*.

Intent:
The intent of this section is to improve public health, safety and general welfare by ensuring that the design and construction of buildings reduce negative environmental impacts and promote occupant comfort. Commissioning ensures that the building functions in the manner intended.

Note: See Chapter 8 of this guide for a new commissioning reference standards for non-energy relate systems.

Changes *to the 2016 Intervening code*: The leading paragraph has been amended to clarify that "I" and "L" occupancies need to comply with CALGreen non-energy related systems. A note was added to direct the code user to the *California Energy Code* for all commissioning requirements for energy-related systems and controls.

Selecting trained personnel (for Commissioning)
This code requires that "Commissioning shall be performed in accordance with this section by trained personnel with experience on projects of comparable size and complexity." The trained personnel manage and facilitate the commissioning process. The trained personnel develop and implement the commissioning tasks and documentation identified in Sections 5.410.2.1 through 5.410.2.7. Trained personnel may include appropriate members of the owner's staff, contractor and design team, as well as independent commissioning professionals.
It is essential that there be a single person designated to lead and manage commissioning activities. In practice, this individual is referenced by various identifiers such as commissioning authority, agent, provider, coordinator, lead, etc. In this guide, the term "commissioning coordinator" is used.
The designated commissioning coordinator may be an independent third-party commissioning professional, a project design team member (e.g., engineer or architect), an owner's engineer or facility staff, contractor or specialty subcontractor. Methods of evaluating the designated commissioning coordinator and trained personnel include review of the following:

1. Technical knowledge.
2. Relevant experience.
3. Potential conflict of interest concerns.
4. Professional certifications and training.
5. Communication and organizational skills.
6. Reference and sample work products.

Compliance method:
Selection of "trained," qualified personnel is required by this code. In order to meet this requirement, the commissioning provider should be evaluated via the methods discussed above. In addition, various organizations have training and certification programs that may be a source for identification of qualified commissioning providers.

5.410.2.1 Owner's or Owner representative's Project Requirements (OPR). [N]
The expectations and requirements of the building appropriate to its phase shall be documented before the design phase of the project begins. This documentation shall include the following:

1. Environmental and sustainability goals.
2. Building sustainable goals.
3. Indoor environmental quality requirements.
4. Project program, including facility functions and hours of operation, and need for after hours operation.
5. Equipment and systems expectations.
6. Building occupant and operation and maintenance (O&M) personnel expectations.

Intent:
The Owner's Project Requirements (OPR) documents the functional requirements of a project and expectations of the building use and operation as it relates to systems being commissioned. The document describes the physical and functional building characteristics desired by the owner and establishes performance and acceptance criteria. The OPR is most effective when developed during predesign and is used to develop the Basis of Design (BOD) during the design process. The level of detail and complexity of the OPR will vary according to building use, type and systems.

Note: See Chapter 8 of this guide for forms and templates.

***Changes to the 2016 Intervening code*:** The reference to the California Energy Commission for energy-related systems in Owner's Project Requirements has been repealed as the energy-related commissioning requirements are now addressed in a "Note" on Section 5.410.2. Additionally, Item 2 "Energy efficiency goals" has been replaced with "Building sustainable goals".

Compliance method:
Compliance is demonstrated by the owner or owner's representative developing and/or approving the Owner's Project Requirements (OPR) document form (see Note above). The OPR can be defined as follows:

1. Environmental and sustainability goals. Establish environmental project goals and objectives exceeding the code for the project's sustainability, which may include:
   •CALGreen voluntary measures or tiers sought, or other specific green building rating system or program credits and/or level of certification sought.
   •Specific environmental or sustainability goals, such as water efficiency, water reuse, CO monitoring, xeriscaping, etc.

2. Building sustainable Goals –Establish goals and targets affecting energy efficiency which may include:
   a) Measures affecting building sustainability desired by owner
      - Building orientation and siting
      - Daylighting
      - Facade, envelope and fenestration
      - Roof
      - Natural ventilation
      - Onsite renewable power generation and net-zero energy use
      - Landscaping and shading

3. Indoor environmental quality requirements. For each program space, describe indoor environmental requirements, including intended use and anticipated schedule:
   - Lighting.
   - Temperature and humidity.
   - Acoustics.
   - Air quality, ventilation and filtration.
   - Desired adjustability of system controls.
   - Accommodations for afterhours use.
   - Other owner requirements, including natural ventilation, operable windows, daylight, views, etc.

4. Project program, including facility functions and hours of opera-tion, and need for after-hours operation. Describe primary purpose, program and use of proposed project:
   - Building size, number of stories, construction type, occupancy type and number.
   - Building program areas, including intended use and anticipated occupancy schedules.
   - Future expandability and flexibility of spaces.
   - Quality and/or durability of materials and building life span desired.
   - Budget or operational constraints.

- Applicable codes.

5. Equipment and systems expectations. Describe the following for each system commissioned:
   - Level of quality, reliability, equipment type, automation, flex-ibility, maintenance and complexity desired.
   - Specific efficiency targets desired technologies or preferred manu-facturers for building systems, acoustics and vibration.
   - Degree of system integration, automation and functionality for controls; i.e., load shedding, demand response and energy management.

6. Building occupant and O&M personnel expectations. Describe the following:
   - How building will be operated and by whom.
   - Level of training and orientation required to understand, operate and use the building systems for operation and maintenance staff, as well as occupants.
   - Building operation and maintenance staff location and capabilities.

Enforcement:
Plan intake: The plan reviewer should confirm the following in the construction documents:

- The owner's project requirements are provided for the six goals listed in the code;
- Receipt of a copy of the signed OPR document; or
- Receipt of a form signed by the owner or owner's representative attesting that the OPR has been completed and approved by the owner.

5.410.2.2 Basis of Design (BOD). [N]
A written explanation of how the design of the building systems meets the OPR shall be completed at the design phase of the building project. The Basis of Design document shall cover the following systems:

1. Renewable energy systems.
2. Landscape irrigation systems.
3. Water reuse systems.

Intent:
The Basis of Design (BOD) establishes how the building systems will meet the OPR and outlines design assumptions not indicated in the design documents. The design team develops the BOD to describe why the systems were selected. The BOD is most effective when developed early in the project design and updated as necessary throughout the design process.

Note: See Chapter 8 of this guide for forms and templates.

***Changes to the 2016 Intervening code*:** The reference and listing of the three energy-related systems in the BOD has been repealed as these energy-related systems are now addressed in a "Note" on Section 5.410.2.

Compliance method:
Compliance is demonstrated by the completion of the BOD document and/or approving the BOD document form (see Note above). The BOD should include the following, as applicable:

1. Renewable energy systems:
   - Provide narrative description of system—type, performance, control type, energy savings and payback period.
   - Describe reason for system selection—why chosen system is better than alternatives, issues such as performance, efficiency, reliability, flexibility, simplicity, expandability, cost, payback period, utility company incentives, owner preference.
   - Sequence of operation—operating schedules, set points and storage capacity.
   - Describe how system meets the OPR.

2. Landscape irrigation systems:
   - Provide narrative description of system—type, performance and water usage.
   - Describe reason for system selection—why chosen system is better than alternatives, issues such as performance, efficiency, reliability, flexibility, expandability, cost, owner preference, simplicity.
   - Sequence of operation—operating schedules and set points.

Describe how system meets the OPR.

3. Water reuse systems:
   - Provide narrative description of system—type, performance, capacity and reuse purpose.
   - Describe reason for system selection—why chosen system is better than alternatives, issues such as performance, efficiency, reliability, flexibility, expandability, cost, owner preference, simplicity.
   - Sequence of operation—operating schedules, set points.
   - Describe how system meets the OPR.

Enforcement:
Plan intake: The plan reviewer should confirm the following in the construction documents:

- The Basis of Design is provided for every system to be commissioned with an explanation of how the design of the building systems meets the OPR and that BOD contains the required elements listed in the code;
- Receipt of a copy of the signed BOD document; or
- Receipt of a form signed by the architect, engineer or designer of record, attesting that the BOD has been completed and meets the requirements of the OPR.

On-site enforcement: The inspector should verify that the Basis of Design criteria as attested by the architect, engineer or designer of record are being implemented during construction.

Sections 5.410.2.3 through 5.410.2.6 *No change from 2016 CALGreen Guide*

5.410.4 Testing and adjusting. new buildings less than 10,000 square feet. Testing and adjusting of systems shall be required for new buildings less than 10,000 square feet or new systems to serve an addition or alteration subject to Section 303.1.

5.410.4.1 (Reserved)
Note: For energy related systems under the scope (Section 100) of the *California Energy Code*, including, heating, ventilation, air conditioning [HVAC) systems and controls, indoor lighting system and controls, as well as water heating systems and controls, refer to *California Energy Code* Section 120.8 for commissioning requirements and Sections 120.5, 120.6, 130.4, and 140.9(b)3 for additional testing requirements of specific systems.

5.410.4.2 Systems. Develop a written plan of procedures for testing and adjusting systems. Systems to be included for testing and adjusting shall include, as applicable to the project:
1. Renewable energy systems.
2. Landscape irrigation systems.
3. Water reuse systems.

Intent:

The purpose of this section is to improve public health, safety and general welfare by enhancing the design and construction of buildings through the use of concepts that reduce negative and increase positive environmental impacts. Commissioning is a vital element in this effort.

Change to the 2016 intervening code: As part of the supplement changes; clarity has been provided in to clarify that this code section only applies to new buildings under 10,000 square feet or additional exceptions have been added and/or amended excepting the commissioning requirements for certain uses. Additionally, A clarification banner [N] was previously added that clarified that this provision applies to new [N] projects only.

The following is a supplement to pages109 through 128 of the Guide

CHAPTER 8
COMPLIANCE FORMS, WORKSHEETS AND REFERENCE MATERIAL

[Code user: please note that the text for entire new Part 1 is shown with no underlined to maintain clarity and readability of the text. Part 1 was added to the CALGreen Code]

Title 23, Waters, California Code of Regulations

APPENDIX D
Prescriptive Compliance Option

Note: Appendix D – Prescriptive Compliance Option is reprinted from the Model Water Efficient Landscape Ordinance (MWELO) contained in the *California Code of Regulations*, Title 23, Division 2, Chapter 2.7, Section 490, as adopted by the Department of Water Resources (DWR) on July 15, 2015. The language contained in Appendix D is reprinted herein as a resource. Please contact DWR to verify the applicable Title 23 requirements prior to using this document for enforcement purposes. For questions regarding this appendix (interpretation, effectiveness, applicability, etc.), DWR may be contacted by the following information:

California Department of Water Resources
Urban Water Use Efficiency Unit
ATTN: Julie Saare-Edmonds, Senior Environmental Scientist
P.O. Box 942836
Sacramento, CA 94236-0001 Email: Julie.Saare- Edmonds@water.ca.gov
Telephone: 916-651-9676 http://water.ca.gov/wateruseefficiency/landscapeordinance/

Appendix D – Prescriptive Compliance Option

(a) This appendix contains prescriptive requirements which may be used as a compliance option to the Model Water Efficient Landscape Ordinance.

(b) Compliance with the following items is mandatory and must be documented on a landscape plan in order to use the prescriptive compliance option:

(1) Submit a Landscape Documentation Package which includes the following elements:

(A) date

(B) project applicant

(C) project address (if available, parcel and/or lot number(s))

(D) total landscape area (square feet), including a breakdown of turf and plant material

(E) project type (e.g., new, rehabilitated, public, private, cemetery, homeowner-installed)

(F) water supply type (e.g., potable, recycled, well) and identify the local retail water purveyor if the applicant is not served by a private well

(G) contact information for the project applicant and property owner

(H) applicant signature and date with statement, "I agree to comply with the requirements of the pre- scriptive compliance option to the MWELO".

(2) Incorporate compost at a rate of at least four cubic yards per 1,000 square feet to a depth of six inches into landscape area (unless contraindicated by a soil test);

(3) Plant material shall comply with all of the following:

(A) For residential areas, install climate adapted plants that require occasional, little or no summer water (average WUCOLS plant factor 0.3) for 75% of the plant area excluding edibles and areas using recycled water; For non-residential areas, install climate adapted plants that require occasional, lit- tle or no summer water (average WUCOLS plant factor 0.3) for 100% of the plant area excluding edibles and areas using recycled water;

(B) A minimum three inch (3″) layer of mulch shall be applied on all exposed soil surfaces of planting areas except in turf areas, creeping or root- ing groundcovers, or direct seeding applications where mulch is contraindicated.

(4) Turf shall comply with all of the following:

(A) Turf shall not exceed 25% of the landscape area in residential areas, and there shall be no turf in non-residential areas;

(B) Turf shall not be planted on sloped areas which exceed a slope of 1 foot vertical elevation change for every 4 feet of horizontal length;

(C) Turf is prohibited in parkways less than 10 feet wide, unless the parkway is adjacent to a park- ing strip and used to enter and exit vehicles. Any turf in parkways must be irrigated by sub- surface irrigation or by other technology that creates no overspray or runoff.

(5) Irrigation systems shall comply with the following:

(A) Automatic irrigation controllers are required and must use evapotranspiration or soil mois- ture sensor data and utilize a rain sensor.

(B) Irrigation controllers shall be of a type which does not lose programming data in the event the primary power source is interrupted.

(C) Pressure regulators shall be installed on the irri- gation system to ensure the dynamic pressure of the system is within the manufacturers' recom- mended pressure range.

(D) Manual shut-off valves (such as a gate valve, ball valve, or butterfly valve) shall be installed as close as possible to the point of connection of the water supply.

(E) All irrigation emission devices must meet the requirements set in the ANSI standard,

ASABE/ ICC 802-2014, "Landscape Irrigation Sprinkler and Emitter Standard." All sprinkler heads installed in the landscape must document a distribution uni- formity low quarter of 0.65 or higher using the pro- tocol defined in ASABE/ICC 802-2014.

(F) Areas less than ten (10) feet in width in any direction shall be irrigated with subsurface irri- gation or other means that produces no runoff or overspray.

(6) For non-residential projects with landscape areas of 1,000 sq. ft. or more, a private submeter(s) to measure landscape water use shall be installed.

(c) At the time of final inspection, the permit applicant must provide the owner of the property with a certificate of completion, certificate of installation, irrigation schedule and a schedule of landscape and irrigation maintenance.

Commissioning Referenced Standards for Non-Energy Systems

The following CALGreen Referenced Standards are included herein as a convenience for the users of the California Green Building Standards Code, but they are not considered to be part of the code unless they are officially adopted by a local jurisdiction.

Part 1: Standards for Compliance with Building Commissioning
Part 2: Commissioning Sample Forms and Templates

Part 1

STANDARDS for COMPLIANCE with BUILDING COMMISSIONING

Reference: Section 5.410.2 Commissioning.

Introduction:
The purpose of this code is to improve public health, safety and general welfare by enhancing the design and construction of buildings through the use of concepts that reduce negative and increase positive environmental impacts. Commissioning is a vital element in this effort.
Definitions used in the *CALGreen* CX Reference standard:

Acronyms

BOD	Basis of Design
Cx	Commissioning
FPT	Functional Performance Test
HVAC	Heating Ventilating and Air-Conditioning
O&M	Operations and Maintenance
OPR	Owner's Project Requirements

Glossary
Acceptance Criteria - The conditions that must be met for systems or equipment to meet defined expected outcomes.

Commissioning (Cx) - Building commissioning as required in this code involves a quality assurance process that begins during design and continues to occupancy. Commissioning verifies that the new building operates as the owner intended and that building staff are prepared to operate and maintain its systems and equipment. Exceptions are allowed for dry storage warehouses of any size and conditioned spaces under 10,000 square accessory to them; and for tenant improvements under 10,000 within a larger space.

Owner - The individual or entity holding title to the property on which the building is constructed.

Commissioning Coordinator - The person who coordinates the commissioning process. This can be either a third-party commissioning provider or an experienced member of the design team or owner in-house staff member.

Commissioning Team - The key members of each party involved with the project designated to provide insight and carry out tasks necessary for a successful commissioning project. Team members may include the commissioning coordinator, owner or owner's representative, building staff, design professionals, contractors or manufacturer's representatives, and testing specialists.

Independent Third-Party Commissioning Professional - A commissioning consultant contracted directly by the owner who is not responsible to, or affiliated with any other member of the design and construction team.

Operation and Maintenance (O&M) Manuals - Documents that provide information necessary for operating and maintaining installed equipment and systems.

Owner Representative – An individual or entity assigned by the owner to act and sign on the owner's behalf.

Process Equipment - Energy-using equipment and components that are not used for HVAC, Electrical, Plumbing and Irrigation operations.

Such devices would include but are not limited to heat transfer, water purifying, air cleaning, air vacuum and air compressing.

Sequence of Operation – A written description of the intended performance and operation of each control element and feature of the equipment and systems.

Selecting Trained Personnel for (Commissioning)

This code requires that "Commissioning shall be performed in accordance with this section by trained personnel with experience on projects of comparable size and complexity." The trained personnel manage and facilitate the commissioning process. The trained personnel develop and implement the commissioning tasks and documentation identified in sections 5.410.2.1 through 5.410.2.7. Trained personnel may include appropriate members of owner staff, contractor and design team as well as independent commissioning professionals.

It is essential that there is a single person designated to lead and manage the commissioning activities. In practice, this individual has been referenced by various identifiers such as commissioning authority, agent, provider, coordinator, lead, etc. In this guide the term "commissioning coordinator" is used.

The designated commissioning coordinator may be an independent third-party commissioning professional, a project design team member (e.g. engineer or architect), an owner's engineer or facility staff, contractor or specialty sub-contractor. Methods of evaluating the designated commissioning coordinator and trained personnel include review of the following:

1. Technical knowledge
2. Relevant experience
3. Potential conflict of interest concerns
4. Professional certifications and training
5. Communication and organizational skills
6. Reference and sample work products

Selection of "trained", qualified personnel is required by this Code. In order to meet this requirement, the commissioning provider should be evaluated via the methods discussed above. In addition, various organizations have training and certification programs that may be a source for identification of qualified commissioning providers.

For information about enforcement and compliance of each commissioning element see sections 5.410.2.1 through 5.410.2.7.

For compliance forms and templates see Part 2 following the standard

Reference: Owner's Project Requirements
***CALGreen* Section: 5.410.2.1 Owner's or Owner representative's Project Requirements (OPR).**

1.1 Intent:
The Owner's Project Requirements (OPR) documents the functional requirements of a project and expectations of the building use and operation as it relates to systems being commissioned. The document describes the physical and functional building characteristics desired by the owner and establishes performance and acceptance criteria. The OPR is most effective when developed during pre-design and used to develop the Basis of Design (BOD) during the design process. The level of detail and complexity of the OPR will vary according to building use, type and systems.

1.2 Compliance Method:
Compliance is demonstrated by the owner or owner's representative developing and/or approving the Owner's Project Requirements (OPR) document and can be defined as follows:

1. Environmental and Sustainability Goals – Establish environmental project goals and objectives exceeding the code for the project's sustainability which may include:
   a) *CALGreen* voluntary measures or Tiers sought, or other specific green building rating system or program credits and/or level of certification sought
   b) Specific environmental or sustainability goals such as water efficiency, water reuse, CO2 monitoring, xeriscaping, etc.
2. Building sustainable Goals –Establish goals and targets affecting energy efficiency which may include:
   b) Measures affecting building sustainability desired by owner
      - Building orientation and siting
      - Daylighting
      - Facade, envelope and fenestration
      - Roof
      - Natural ventilation
      - Onsite renewable power generation and net-zero energy use
      - Landscaping and shading
3. Indoor Environmental Quality Requirements - For each program space describe indoor environmental requirements including intended use and anticipated schedule
   a) Temperature and humidity
   b) Acoustics
   c) Air quality, ventilation and filtration
   d) Desired adjustability of system controls
   e) Accommodations for after-hours use
   f) Other owner requirements including natural ventilation, operable windows, daylight, views, etc.
4. Project Program, Including facility functions and hours of operation, and need for afterhours operation – Describe primary purpose, program and use of proposed project
   a) Building size, number of stories, construction type, occupancy type and number
   b) Building program areas including intended use and anticipated occupancy schedules
   c) Future expandability and flexibility of spaces
   d) Quality and/or durability of materials and building lifespan desired
   e) Budget or operational constraints

f) Applicable codes

5. Equipment and Systems Expectations – Describe the following for each system commissioned:
    a) Level of quality, reliability, equipment type, automation, flexibility, maintenance and complexity desired
    b) Specific efficiency targets, desired technologies, or preferred manufacturers for building systems, acoustics and vibration
    c) Degree of system integration, automation and functionality for controls; i.e.xxx

6. Building Occupant and O&M Personnel Expectations – Describe the following:
    a) How building will be operated and by whom
    b) Level of training and orientation required to understand, operate and use the building systems for building operation and maintenance staff, as well as occupants
    c) Building operation and maintenance staff location and capabilities

1.3 Enforcement:

At their discretion, the inspector confirms demonstrated compliance at Plan Intake by:

a) Receipt of a copy of the OPR document, or
b) Receipt of a form signed by the owner or owner representative attesting that the OPR has been completed and approved by the owner.

Reference: 2 Basis of Design (BOD)
***CALGreen* Section: 5.410.2.2 Basis of Design (BOD).**

2.1 Intent:

The Basis of Design (BOD) describes the building systems to be commissioned and outlines design assumptions not indicated in the design documents. The design team develops the BOD to describe how the building systems design meets the Owner's Project Requirements (OPR), and why the systems were selected. The BOD is most effective when developed early in the project design and updated as necessary throughout the design process.

2.2 Compliance Method:

Compliance requires the completion of the BOD document and should include the following where applicable:

1. Renewable Energy Systems
    a) Provide narrative description of system – type, performance, control type, energy savings, payback period
    b) Describe reason for system selection – why chosen system is better than alternatives, issues such as performance, efficiency, reliability, flexibility, simplicity, expandability, cost, payback period, utility company incentives, owner preference,
    c) Sequence of Operation – operating schedules, setpoints, storage capacity
    d) Describe how system meets the OPR
2. Landscape Irrigation Systems
    a) Provide narrative description of system – type, performance, water usage
    b) Describe reason for system selection – why chosen system is better than alternatives, issues such as performance, efficiency, reliability, flexibility, expandability, cost, owner preference, simplicity
    c) Sequence of Operation – operating schedules, setpoints
    d) Describe how system meets the OPR
3. Water Reuse Systems
    a) Provide narrative description of system – type, performance, capacity, reuse purpose
    b) Describe reason for system selection – why chosen system is better than alternatives, issues such as performance, efficiency, reliability, flexibility, expandability, cost, owner preference, simplicity
    c) Sequence of Operation – operating schedules, setpoints

d) Describe how system meets the OPR

2.3 Enforcement:

At their discretion, the building official confirms demonstrated compliance at Plan Intake by:

a) Receipt of a copy of the BOD document, or
b) Receipt of a form signed by the architect, engineer or designer of record, attesting that the BOD has been completed and meets the requirements of the OPR.

Reference: 3 Commissioning measures shown in the construction documents *CALGreen* Section: 5.410.2 Commissioning.

This section provides details for element 3: Commissioning measures shown in the construction documents.

3.1 Intent:

Include commissioning measures or requirements in the construction documents (plans and specifications). Commissioning measures or requirements should be clear, detailed and complete to clarify the commissioning process.

3.2 Compliance Method:

Compliance is achieved by including commissioning requirements in the project specifications. The commissioning specifications should include the following:

1. Primary (and optionally all) commissioning requirements are included in the general specification division (typically Division 1) and clear cross references of all commissioning requirements to and from the general division are included to ensure all subcontractors are held to them
2. A list of the systems and assemblies covered by the commissioning requirements.
3. Roles and responsibilities of all parties including:
   i. General contractor and subcontractors, vendors, construction manager
   ii. Commissioning provider lead
   iii. Owner, facility staff
   iv. Architect and design engineers
   v. Including the non-contractor parties in the construction specifications is for information only to provide the contractor with context for their work
   vi. Include who writes checklists and tests, who reviews and approves test forms, who directs tests, who executes tests, who documents test results and who approves completed tests. These roles may vary by system or assembly.
4. Meeting requirements
5. Commissioning schedule management procedures
6. Issue and non-compliance management procedures
7. Requirements for execution and documentation of installation, checkout and start up, including controls point-to-point checks and calibrations
8. Specific testing requirements by system, including:
   i. Monitoring and trending
   ii. Opposite season or deferred testing requirements, functions and modes to be tested
   iii. Conditions of test
   iv. Acceptance criteria, and any allowed sampling
   v. Include details of the format and rigor of the test forms required to document test execution
   vi. Including example forms is recommended
9. Submittal review requirements and approval process.
10. Content, authority and approval process of the commissioning plan.
11. Commissioning documentation and reporting requirements.
12. Facility staff training requirements and verification procedures.
13. O&M manual review and approval procedures.
14. System's manual development and approval requirements and procedures.

15. Definitions section.

3.3 Enforcement:
At their discretion, the inspetor confirms demonstrated compliance at Plan Intake by:

a) Receipt of a copy of the commissioning specifications, or
b) Receipt of a form signed by the owner or owner representative or designer of record attesting that the owner-approved commissioning specifications are included in the construction documents.

Reference: 4 Commissioning plan.
CALGreen Section: 5.410.2.3 Commissioning plan.

4.1 Intent:
The Commissioning Plan (Cx Plan) establishes the commissioning process guideline for the project and commissioning team's level of effort by identifying the required Cx activities to ensure that the Owner's Project Requirements (OPR) and the Basis of Design (BOD) are met. The Cx Plan also includes a commissioning schedule from design to occupancy.

4.2 Compliance Method:
Compliance is demonstrated by preparation of a project specific Cx Plan that includes the elements listed in the code section above. The following gives guidance for developing the components of the Commissioning Plan:

1. General project information - Provide project identifying information including but not limited to the following:
   -Project Name, Owner, Location,
   -Building type, Building area,
   -Project Schedule
   -Contact information of individual/company providing the commissioning services
2. Commissioning Goals – Document the commissioning goals, including, but not limited to:
   -Meeting CALGreen code requirements for commissioning
   -Meeting OPR and BOD requirements
   -Carrying out requirements for commissioning activities as specified in plans and specifications
3. Systems to be commissioned – See BOD
   a. An explanation of the original design intent - Document the performance objectives and design intent for each system listed to be commissioned in a written narrative
      -Refer to the OPR and BOD documents
   b. Equipment and systems to be tested, including the extent of tests
      -Provide a list of equipment and systems to be tested
      -Describe the range and extent of tests to be performed for each system component, and interface between systems
   c. Functions to be tested - Provide example functional test procedures to identify the level of testing detail required
      -See (Section 5.410.2.4) FPT guidance for more information
   d. Conditions under which the test shall be performed - Identify the conditions under which the major operational system functions are to be tested, including:
      -Normal operations and part-load operations
      -Seasonal testing requirements
      -Restart of equipment and systems after power loss
      -System alarm confirmations
   e. Measurable criteria for acceptable performance - Include measurable criteria for acceptable performance of each system to be tested
4. Commissioning Team Information - Provide a contact list for all Commissioning team members, including but not limited to:
   -Owner, owner's representative

-Architect, Engineers
-Designated commissioning representative
-General contractor, sub-contractors, and construction manager

5. Commissioning process activities, schedules and responsibilities
-Establish prescribed commissioning process steps and activities to be accomplished by the Cx team throughout the design to occupancy
-For each phase of the work, define the roles and responsibilities for each member of the Cx team
-List the required Cx deliverables, reports, forms and verifications expected at each stage of the commissioning effort
-Include the confirmation process for the O&M manual, systems manual and the facility operator and maintenance staff training

4.3 Enforcement:

At their discretion, the inspector confirms demonstrated compliance at Plan Intake by:

a) Receipt of a copy of the Commissioning Plan, or
b) Receipt of a form signed by the owner or owner representative attesting that the Cx Plan has been completed.

Reference: 5 Functional performance testing
CALGreen Section: 5.410.2.4 Functional performance testing.

5.1 Intent:

Develop and implement the functional performance tests to document, as set forth in the Commissioning Plan, that all components, equipment, systems and system-to-system interfaces were installed as specified, and operate according to the Owner's Project Requirements, Basis of Design, and plans and specifications.

The following systems to be functionally tested are listed in the Basis of Design (5.410.2.2 of the Code):

1. Renewable Energy Systems
2. Landscape Irrigation Systems
3. Water Reuse Systems

5.2 Compliance Method:

Compliance is demonstrated by developing and implementing test procedures for each piece of commissioned equipment and interfaces between equipment and systems according to the building-specific Commissioning Plan. Tests should include verification of proper operation of all equipment features, each part of the sequence of operation, overrides, lockouts, safeties, alarms, occupied and unoccupied modes, loss of normal power, exercising a shutdown, startup, low load through full load (as much as is possible) and back, staging and standby functions, scheduling, energy efficiency strategies and loop tuning.

Elements of acceptable test procedures include:

1. Date and Party -- Identification of the date of the test and the party conducting the test.
2. Signature Block **--** Signature of the designated commissioning lead and the equipment installing contractor attesting that the recorded test results are accurate.
3. Prerequisites -- Any conditions or related equipment checkout or testing that needs to be completed before conducting this test.
4. Precautions -- Identification of the risks involved to the test team members and the equipment and how to mitigate them.
5. Instrumentation **--** Listing of the instrumentation and tools necessary to complete the test.
6. Reference – In each procedure item, identify the source for what is being confirmed (e.g., sequence of operation ID, operating feature, specification requirement, etc.).
7. Test Instructions **--** Step-by-step instructions of how to complete the test, including functions to test and the conditions under which the tests should performed.

8. Acceptance Criteria **--** Measurable pass / fail criteria for each step of the test, as applicable.
9. Results **--** Expected system response and space to document the actual response, readings, results and adjustments.
10. Return to Normal **--** Instructions that all systems and equipment are to be returned to their as-found state at the conclusion of the tests.
11. Deficiencies -- A list of deficiencies and how they were mitigated.

5.3 Enforcement:

At their discretion, the inspector confirms demonstrated compliance during Onsite Enforcement by:

a) Receipt of a copy of completed and signed Functional Performance Tests and corrected deficiencies, or

b) Receipt of a form signed by the owner, owner representative or commissioning coordinator attesting that the Functional Performance Tests have been completed and any deficiencies corrected.

Reference: 6.1 Documentation and training
CALGreen Section: 5.410.2.5 Documentation and training.

Section: 5.410.2.5.1 Systems manual.

6.1.1 Intent:

The Systems Manual documents information focusing on the operation of the building systems. This document provides information needed to understand, operate, and maintain the equipment and systems and informs those not involved in the design and construction of the building systems. This document is in addition to the record construction drawings, documents, and the Operation & Maintenance (O&M) Manuals supplied by the contractor. The Systems Manual is assembled during the construction phase and available during the contractors' training of the facility staff.

A6.1.6.1.2 Compliance Method:

Compliance is demonstrated by providing the Systems Manual. The information in the Systems Manual includes the following information:

1. Site information, including facility description, history and current requirements
   a) Site Information
      i. Location of property - Address
      ii. Site acreage
      iii. Local utility information
         -Water service provider
         -Natural/LPG gas service provider
         -Electrical service provider
         -Telecommunications service provider
         -Other service providers
   b) Facility Description
      i. Use/Function
      ii. Square footage
      iii. Occupancy Type
      iv. Construction Type
      v. Basis of design
      vi. Location of major systems & equipment
   c) Project History
      i. Project requirements
         -Owner's Project Requirements (OPR)

-Basis of Design (BOD)

ii. Project undocumented events
iii. Record Drawings & Documents
iv. Final control drawings and schematics
v. Final control sequences
vi. Construction documents - Location or delivery information
-Mechanical & electrical drawings
-Specifications
-Submittals
-Project change orders and information

d) Current requirements
i. Building operating schedules
ii. Space temperature, humidity, & pressure, CO2 setpoints
iii. Summer and winter setback schedules
iv. Chilled & hot water temperatures
v. As-built control setpoints and parameters

2. Site contact information
a) Owner information
b) Emergency contacts
c) Design Team: Architect, Mechanical, Engineer, Electrical Engineer, etc.
d) Prime Contractor contact information
e) Subcontractor information
f) Equipment supplier contact information

3. Basic operation & maintenance, including general site operating procedures, basic trouble shooting, recommended maintenance requirements site events log
*a)*Basic operation
i. Written narratives of basic equipment operation
ii. Interfaces, interlocks and interaction with other equipment and systems
iii. Initial maintenance provide by contactor
*b)*General site operating procedures
i. Instructions for changes in major system operating schedules
ii. Instructions for changes in major system holiday & weekend schedules
*c)*Basic troubleshooting
i. Cite any recommended troubleshooting procedures specific to the major systems and equipment installed in the building.
ii. Manual operation procedures
iii. Standby/Backup operation procedures
iv. Bypass operation procedures
v. Major system power fail resets and restarts
vi. Trend log listing
*d)*Recommended maintenance events log
*e)*Operation & Maintenance Manuals - Location or delivery information

4. Major systems
a)Renewable energy systems
i. Photovoltaic panels & inverters
ii. Wind powered electrical generators & inverters
b)Landscape irrigation systems
i. Water distribution diagrams
ii. Control system
c)Water reuse systems
i. Reclaimed water system for indoor use
ii. Reclaimed water for irrigation use

5. Site equipment inventory and maintenance notes
a)Spare parts inventory
b)Frequently required parts and supplies
c)Special equipment required to operate or maintain systems

d) Special tools required to operate or maintain systems

6. A copy of all special inspection verifications required by the enforcing agency of this code
7. Other resources and documentation

6.1.3 Enforcement:
At their discretion, the inspector confirms demonstrated compliance during Onsite Enforcement by:

a. Receipt of a copy of the Systems Manual, or
b. Receipt of a form signed by the owner or owner representative attesting that the System's Manual has been completed.

Reference: 6.2 Documentation and training
***CALGreen* Section: 5.410.2.5 Documentation and training.**

Section: 5.410.2.5.2 Systems operations training.

6.2.1 Intent:
The systems operation training verifies that a training program is developed to provide training to the appropriate maintenance staff for each equipment type and/or system and that this training program is documented in the commissioning report. The systems operations training program is specified in the project specifications for the major systems listed. The System Manual, Operation and Maintenance (O&M) documentation, and record drawings are prepared and available to the maintenance staff prior to implementation of any training or the development of a written training program. The training program is to be administered when the appropriate maintenance staff is made available to receive training.

A6.1.6.2.2 Compliance Method:
The written training program includes: (a) learning goals and objectives for each session, (b) training agenda, topics, and length of instruction for each session, (c) instructor information and qualifications, (d) location of training sessions (onsite, off-site, manufacturer's or vendor's facility), (e) attendance forms, (f) training materials, and (g) description on how the training will be archived for future use.

1. Systems/equipment overview
   a) Review OPR and BOD related to the major systems and equipment
   b) Describe system type and configuration
   c) Explain operation all major systems and equipment and how it interfaces with other systems and equipment
   d) Describe operation of critical devices, controls and accessories
   e) Review location of the major systems and equipment
   f) Describe operation of control system for each system, location of critical control elements, and procedures to properly operate control system
   g) Review recommendations for implementation to reduce energy and water use

2. Review and demonstration of servicing/preventive maintenance
   a) Explain location or delivery contact of the Operation & Maintenance manuals
   b) Review of all manufacturer's recommended maintenance activities to maintain warranty
   c) Review and demonstrate frequent maintenance activities and suggested schedule.
   d) Review and demonstrate typical servicing procedures and techniques (electrical current, pressure, and flow readings, etc; calibration procedures, point trending, power fail restart procedures, etc.)
   e) Locate, observe and identify major equipment, systems, accessories and controls
   f) Review emergency shut-offs and procedures
3. Review of the information in the Systems Manual

a) Describe use of System Manual
b) Review elements of System Manual
c) Explain how to update and add revisions to System Manual

4. Review record drawings on the systems/equipment
   a) Explain location or delivery contact of the record drawings
   b) Review record drawings, revisions, and changes to original design drawings.
   c) Review equipment schedules and compare with actual installed systems

6.2.3 Enforcement:
At their discretion, the inspector confirms demonstrated compliance during Onsite Enforcement by:

1. In the event appropriate maintenance staff is made available to receive training for each equipment type and/or system installed in the building.

   a. Receipt of a copy of the written training program and completed attendance forms, or
   b. Receipt of a form signed by the owner or owner representative attesting that the training program and delivery of training has been completed

2. In the event appropriate maintenance staff are unavailable to receive training for each equipment type and/or system installed in the building.

   a. Receipt of a copy of the training program provided to the owner or owner's representative, or
   b. Receipt of a form signed by the owner or owner representative attesting that the written training program has been provided.

Reference: 7 Commissioning report
***CALGreen* Section: 5.410.2.6 Commissioning report.**

7.1 Intent:
The Commissioning Report documents the commissioning process and test results. The report includes confirmation from the commissioning agent verifying that commissioned systems meet the conditions of the Owner's Project Requirements (OPR), Basis of Design (BOD), and Contract Documents.

7.2 Compliance Method:
The Components of the Commissioning Report include the following and are defined as follows:

1. Executive summary of process and results of commissioning program – including observations, conclusions and any outstanding items.
2. History of any system deficiencies and how resolved
   a) Include outstanding deficiencies and plans for resolution
   b) Include plans for seasonal testing scheduled for a later date
3. System performance test results and evaluations
4. Summary of training process completed and scheduled
5. Attach commissioning process documents
   a) Commissioning Plan
   b) Owners Project Requirements (OPR)
   c) Basis of Design (BOD)
   d) Executed installation checklists
   e) Executed Functional Performance Test (FPT) forms
   f) Recommendations for end-of-warranty review activities

7.3 Enforcement:
At their discretion, the inspector confirms demonstrated compliance during Onsite Enforcement

by:

a) Receipt of a copy of the Commissioning Report, or
b) Receipt of a form signed by the owner or owner representative attesting that the Cx Report has been completed.

Part 2
SAMPLE FORMS and TEMPLATES for COMMISSIONING

Note: *Following are examples of templates and/or forms that may be used or adopted for verification compliance with commissioning. Code users may provide their own documents as permitted by the enforcing agency. For each subsection of commissioning, samples are provided; in a few cases with narrative templates, and in most cases with compliance forms. Simplified forms or more detailed forms, but not both, may be selected to submit for each project.*

CALGreen COMPLIANCE FORM
OWNER'S PROJECT REQUIREMENTS (OPR)

The following form may be required to be printed on the permit set of construction drawings or submitted separately. Italicized text indicates direct or partial quotes from the *CALGreen Code.*

CALGreen Commissioning Requirement 5.410.2.1, Owner's Project Requirements (OPR)

5.410.2.1 Owner's or Owner representative's Project Requirements (OPR). [N] The expectations and requirements of the building appropriate to its phase shall be documented before the design phase of the project begins. This documentation shall include the following:

1. Environmental and sustainability goals.
2. Building sustainable goals.
3. Indoor environmental quality requirements.
4. Project program, including facility functions and hours of operation, and need for after hours operation.
5. Equipment and systems expectations.
6. Building occupant and operation and maintenance (O&M) personnel expectations.

	OPR ELEMENTS	INCLUDED
1.	Environmental and sustainability goals.	☐
2.	Building sustainable goals.	☐
3.	Indoor environmental quality requirements.	☐
4.	Project program, including facility functions and hours of operation, and need for after-hours operation.	☐
5.	Equipment and systems expectations.	☐
6.	Building occupant and O&M personnel expectations.	☐

_____ _____

Owner/Owner's Representative Signature Date

OWNER'S PROJECT REQUIREMENTS (OPR) COMPLIANCE CHECKLIST	

INCORPORATE THIS FORM IN THE PLANS

Project Address: _____

Permit Number: _____

ITEM #	OPR ITEMS	PAGE NUMBER IN OPR DOCUMENT
	PROJECT PROGRAM	
1	General building information (size, stories, construction type, occupancy type and number)	
2	Intended uses and schedules	
3	Future expandability and flexibility of spaces	
4	Quality and/or durability of materials and desired building lifespan	
5	Budget or operation constraints	
	ENVIRONMENTAL AND SUSTAINABILITY GOALS	
6	Level of compliance with the California Green Building Standards Code: Mandatory, Tier 1, or Tier 2	
7	Specific environmental or sustainability goals (e.g. water efficiency, water reuse, CO_2 monitoring, xeriscaping, etc.)	
	BUILDING SUSTAINABLE GOALS	
8	Measures affecting energy efficiency desired by owner (e.g. Building orientation, shading, daylighting, natural ventilation, renewable power, etc.	
	INDOOR ENVIRONMENTAL QUALITY REQUIREMENTS	
9	Lighting	
10	Temperature and Humidity	
11	Acoustics	

12	Air quality, ventilation, and filtration	
13	Desired adjustability of system controls	
14	Accommodations for after-hours use	
15	Other owner requirements (e.g. natural ventilation, daylight, views, etc.)	

	EQUIPMENT AND SYSTEMS EXPECTATIONS	
16	Level of quality, reliability, equipment type, flexibility, maintenance, and complexity desired	
17	Specific efficiency targets, desired technologies, or preferred manufacturers for building systems, acoustics and vibration	
18	Degree of system integration, automation, and functionality for controls (i.e. load shedding, demand response, energy management)	
	BUILDING OCCUPANT AND O&M PERSONNEL EXPECTATIONS	
19	Description of how the building will be operated and by whom	
20	Level of training and orientation required to understand, operate and use the building systems for building operation and maintenance staff, as well as occupants	
21	Building operation and maintenance staff location and capabilities	
	COMMISSIONING AGENT INFORMATION	
22	Name of Commissioning Agency:	
23	Address of Agency:	
24	Contact person(s) Name(s):	

Owner/Owner Representative Acknowledgement

Owner's Project Requirements (OPR). The expectations and requirements of the building appropriate to its phase shall be documented before the design phase of the project begins. The OPR includes the elements listed above and have been approved by the Owner or Owner's Representative.

Name: _____ ☐ Owner ☐ Owner's Representative

Company Name (if applicable): _____

Signature: _____ Date: _____

BASIS OF DESIGN (BOD)
COMPLIANCE TEMPLATE

Documentation of the Basis of Design (BOD) is a step required for compliance with CALGreen Code, section 5.410.2.1, for newly constructed buildings greater than 10,000 sq. ft. This template is a guide for use by the design team.

1. Renewable Energy Systems

1.1. Narrative Description of System

A. [System type(s), location, inverter type, control type, performance, efficiency, energy savings, payback period]
B. [Describe how system meets any special requirements listed in the Owner's Project Requirements document.]

1.2. Reasons for System Selection

[Reasons that the selected renewable energy systems are a better choice than alternatives, e.g. performance, efficiency, reliability, flexibility, simplicity, expandability, cost, payback period, utility company incentives, owner preference, space constraints, cost, owner preferences, ease of maintenance, etc.]

1.3. Renewable Energy System Generation Calculations

[Describe sizing calculation method, assumptions, and results]

2. Landscape Irrigation Systems

2.1. Narrative Description of System

A. [System type(s), location, control type, performance, efficiency, water savings]
B. [Describe how system meets any special requirements listed in the Owner's Project Requirements document.]

2.2. Reasons for System Selection

[Reasons that the selected landscape irrigation systems are a better choice than alternatives. E.g. performance, efficiency, reliability, flexibility, simplicity, expandability, cost, payback period, utility company incentives, owner preference, cost, owner preferences, ease of maintenance, etc.]

2.3. Landscape Irrigation System Calculations

[Describe sizing calculation method, assumptions, and results]

3. Water Reuse Systems

3.1. Narrative Description of System

A. [System type(s), location, space requirements, equipment requirements, control type, performance, efficiency, potable water savings, payback period]
B. [Describe how system meets any special requirements listed in the Owner's Project Requirements document.]

3.2. Reasons for System Selection

[Reasons that the selected water reuse systems are a better choice than alternatives. E.g. performance, efficiency, reliability, flexibility, simplicity, expandability, cost, payback period, utility company incentives, owner preference, space constraints, cost, owner preferences, ease of maintenance, etc.]

3.3. Water Reuse System Calculations

BASIS OF DESIGN (BOD) **COMPLIANCE CHECKLIST**	

[Describe sizing calculation method, assumptions, and results]

INCORPORATE THIS FORM IN THE PLANS

Project Address: _____

Permit Number: _____

ITEM #	BOD ITEMS	PAGE NUMBER IN BOD DOCUMENT
	RENEWABLE ENERGY SYSTEMS (IF ANY)	
1	Narrative description of system (i.e. system type(s), location, inverter type, control type, performance, efficiency, energy savings, payback period, other)	
2	Description of how the system meets requirements listed in OPR	
3	Reasons for system selection, as opposed to alternatives (e.g. performance, efficiency, reliability, flexibility, simplicity, expandability, cost, payback period, etc.)	
4	Renewable energy system generation calculations: sizing calculation method, assumptions, and results	
	LANDSCAPE IRRIGATION SYSTEMS	
5	Narrative description of system (i.e. system type(s), location, control type, performance, efficiency, water savings, other)	
6	Description of how the system meets requirements in OPR	
7	Reasons for system selection, as opposed to alternatives (e.g. performance, efficiency, reliability, flexibility, cost, utility company incentives, etc.)	
8	Landscape irrigation system calculations: sizing calculation method, assumptions, and results	
	WATER REUSE SYSTEM (IF ANY)	
11	Narrative description of system (i.e. system type(s), location, space requirements, equipment requirements, control type, performance, efficiency, potable water savings, payback period, other)	
12	Description of how the system meets requirements in OPR	
13	Reasons for system selection, as opposed to alternatives (e.g. performance, efficiency, reliability, flexibility, simplicity, cost, payback period, etc.)	
14	Water reuse system calculations: sizing calculation method, assumptions, and results	

Architect/Engineer/Designer Acknowledgement

I hereby acknowledge the Basis of Design (BOD) document has been completed and meets the Owner's Project Requirements (OPR)

	Name	License Number	Signature	Date
Architect of Record				
Landscape Architect				
Renewable Energy System Designer				
Other (specify):				

Commissioning Agent Acknowledgment

I have reviewed the Basis of Design (BOD) and verified that it meets the Owner's Project Requirements (OPR):

Name: _____

Company Name (if applicable): _____

Agent's Signature: _____ Date: _____

Cx MEASURES IN CONSTRUCTION DOCUMENTS COMPLIANCE FORM	

The following form may be required to be printed on the permit set of construction drawings or submitted separately.

CALGreen Commissioning Requirement 5.410.2 Commissioning Measures in the Construction Documents

5.410.2. Commissioning measures shall be shown in the construction documents.
The commissioning measures shown in the construction documents include the checked elements listed below and have been approved by the Owner, Owner's Representative or Designer of record.

	Commissioning Measure Elements[1]	Included
1.	Measures shown in the specifications and cross referenced	□
2.	List of commissioned equipment and systems	□
3.	Cx roles and responsibilities of all parties	□
4.	Meeting requirements	□
5.	Commissioning schedule management procedures	□
6.	Procedures for addressing outstanding issues or non-compliance	□
7.	Requirements for execution and documentation of installation and equipment start up	□
8.	Specific testing requirements for each system type1	□
9.	Submittal review and approval requirements	□
10.	Contents and approval process of the commissioning plan	□
11.	Cx documentation and reporting requirements	□
12.	Facility staff training requirements and verification procedures	□
13.	O&M manual review and approval procedures	□
14.	Systems manual development and approval procedures	□
15.	Definitions	□

1. These are not the detailed step-by-step test procedures, but are lists of features, elements, modes and conditions of tests for specific equipment.

_____ _____

Owner / Owner Representative or Designer of Record Signature

Date

Cx MEASURES IN CONSTRUCTION DOCUMENTS	

INCORPORATE THIS FORM IN THE PLANS

Project Address: _____

Permit Number: _____

ITEM #	Commissioning Measures Items
1	Measures shown in the specifications and cross referenced
2	List of commissioned equipment and systems
3	Cx roles and responsibilities of all parties
4	Meeting requirements
5	Commissioning schedule management procedures
6	Procedures for addressing outstanding issues or non-compliance
7	Requirements for execution and documentation of installation and equipment start up
8	Specific testing requirements for each system type
9	Submittal review and approval requirements
10	Contents and approval process of the commissioning plan
11	Cx documentation and reporting requirements
12	Facility staff training requirements and verification procedures
13	O & M manual review and approval procedures
14	Systems manual development and approval procedures
15	Definitions

Commissioning Agent Acknowledgment

I have reviewed the construction documents listed above and verified their compliance with the owner's project requirements, basis of design, and commissioning plan.

Name: _____

Company Name (if applicable):
_____

Agent's signature: _____Date: _____

COMMISSIONING PLAN COMPLIANCE FORM	

The following form may be required to be printed on the permit set of construction drawings or submitted separately.

CALGreen Commissioning Requirement 5.410.2.3 Commissioning Plan

5.410.2.3 Commissioning plan. [N] *Prior to permit issuance a commissioning plan shall be completed to document how the project will be commissioned. The commissioning plan shall include the following:*
(See Cx plan elements checklist below)

The commissioning plan should be started during the design phase of the building project, include the checked elements listed below and approved by the Owner or Owner Representative.

	Commissioning Plan Elements[1]	**Included**
1.	General project information	☐
2.	Commissioning goals	☐
4.	An explanation of original design intent	☐
5.	Equipment and systems to be commissioned and tested, including extent of tests	☐
6.	Functions to be tested and conditions of tests1	☐
7.	Measurable performance criteria	☐
8.	Cx team information	☐
9.	Cx activities, schedules and responsibilities	☐

1. These are not the detailed step-by-step test procedures, but are lists of features, elements, modes and conditions of tests for specific equipment.

_____ _____
Owner / Owner Representative Signature Date

COMMISSIONING PLAN COMPLIANCE CHECKLIST	

INCORPORATE THIS FORM IN THE PLANS

Project Address: _____

Permit Number: _____

ITEM #	COMMISSIONING PLAN ITEMS[1]	PAGE NUMBER IN COMMISSIONING PLAN DOCUMENT
	GENERAL PROJECT INFORMATION	
1	Project name, owner, location	
2	Building type, building area	
3	Overall project commissioning schedule	
4	Contact information for individual/company providing commissioning services	
	COMMISSIONING GOALS	
5	Meet California Green Building Standards Code requirements for commissioning	
6	Meeting OPR and BOD requirements	
7	Carrying out requirements for commissioning activities as specified in plans and specifications	
	SYSTEMS TO BE COMMISSIONED	
8	Explanation of the original design intent (refer to OPR and BOD documents)	
9	Equipment and systems to be tested*, functions to be tested, conditions under which the test shall be performed, and measurable criteria for acceptable performance	
	COMMISIONING TEAM INFORMATION	
10	List of all team members and contact information (i.e. owner, owner's representative, architect, engineers, designated commissioning representative, and (if available): general contractor, sub-contractors, and construction manager)	
	COMMISSIONING PROCESS ACTIVITIES, SCHEDULES, AND RESPONSIBILITIES	
11	Prescribed commissioning process steps and activities to be accomplished by the Cx team throughout the design to occupancy	
12	Roles and responsibilities for each member of the Cx team for each phase of the work	
13	Required Cx deliverables, reports, forms, and verifications expected at each stage of the commissioning effort	
14	Confirmation process for the O&M manual, systems manual and the facility operator and maintenance staff training	

1. The following systems shall be tested: renewable energy systems, landscape irrigation systems and water reuse systems

Owner/Owner Representative Acknowledgment

The commissioning plan includes the items listed above and have been approved by the Owner or Owner Representative:

Name:_____ ☐ Owner ☐ Owner's Representative

Company Name (if applicable): _____

Signature: _____ Date: _____

FUNCTIONAL PERFORMANCE TESTING COMPLIANCE FORM	

CALGreen Commissioning Requirement 5.410.2.4-Functional Performance Testing

5.410.2.4 Functional performance testing. [N] *Functional performance tests shall demonstrate the correct installation and operation of each component, system, and system-to-system interface in accordance with the approved plans and specifications. Functional performance testing reports shall contain information addressing each of the building components tested, the testing methods utilized, and include any readings and adjustments made.*

Test forms have been developed for each piece of commissioned equipment and system and include the checked elements listed below. These tests have been executed with deficiencies corrected.

	Functional Test Elements	**Included**
1.	Date and parties participating	☐
2.	Signature block attesting test is complete and accurate	☐
3.	Prerequisites	☐
4.	Precautions	☐
5.	Instrumentation required	☐
6.	Reference to the source of what is being confirmed (sequences, packaged features, etc.)	☐
7.	Detailed step-by-step test instructions	☐
8.	Acceptance criteria	☐
9.	Results	☐
10.	Confirmation of returning to normal	☐
11.	Deficiency list	☐

_____
_____
Cx Coordinator Signature Date

FUNCTIONAL PERFORMANCE TESTING COMPLIANCE FORM-REPORT	

REPORT # (e.g. FPT-003)	**SYSTEM/EQUIPMENT TEST REPORT** (See minimum report requirements on page 2 of this form)	**PAGE/TAB # IN COMMISSIONING REPORT**

THIS FORM IS TO COMPLETED FOR THE TIME OF INSPECTION

Project Address: _____

Permit Number: _____

List the functional test reports below for all systems to be tested (see Form 5.4-8.1, item #9)

Minimum Requirements for Test Report

1. Date and Party – Identification of the date of the test and the party conducting the test.
2. Signature Block – Signature of the designated commissioning lead and the equipment installing contractor attesting that the recorded test results are accurate.
3. Prerequisites – any conditions or related equipment checkout or testing that needs to be completed before conducting this test.

4. Precautions – Identification of the risks involved to the test team members and the equipment and how to mitigate them.
5. Instrumentation – Listing of the instrumentation and tools necessary to complete the test.
6. Reference – In each procedure item, identify the source for what is being confirmed (e.g. sequence of operation ID, operating feature, specification requirement, etc.)
7. Test Instructions – Step-by-step instructions of how to complete the test, including functions to test and the conditions under which the tests should be performed.
8. Acceptance Criteria – Measurable pass/fail criteria for each step of the test, as applicable.
9. Results – Expected system response and space to document the actual response, readings, results, and adjustments.
10. Return to Normal – Instructions that all systems and equipment are to be returned to their as-found state at the conclusion of the tests.
11. Deficiencies – A list of deficiencies and how they were mitigated.

Commissioning Agent Acknowledgment

I have reviewed the test reports listed above and verified that they are complete; these tests have been executed with deficiencies corrected.

Name: _____

Company Name (if applicable): _____

Agent's signature: _____ Date: _____

SYSTEMS MANUAL COMPLIANCE FORM	CALGreen Std. BSC-5.4-10 10-08-10

CALGreen Commissioning Requirement 5.410.2.5.1-Documentation and Training-Systems Manual

5.410.2.5.1 Systems Manual. [N] *Documentation of the operational aspects of the building shall be completed within the Systems Manual and delivered to the building owner or representative. The Systems Manual shall include the following: checked elements listed below. (See elements checklist below)*

	System Manual Elements	**Included**
1.	Site information including facility description, history and current requirements	☐
2.	Site contact information	☐
3.	Basic operations and maintenance and troubleshooting	☐
4.	Systems covered include major systems listed under the BOD.	☐
5.	Site equipment inventory and maintenance notes	☐
6.	Special inspection verifications	☐
7.	Other resources and documentation	☐

_____ _____

Owner or Owner Representative Signature Date

SYSTEM OPERATIONS TRAINING COMPLIANCE FORM	

CALGreen Commissioning Requirement 5.410.2.5.2-System Operations Training

5.410.2.5.2 Systems Operations Training.[N] *A program for training of the appropriate maintenance staff for each equipment type and/or system shall be developed and documented in the commissioning report and shall include the following. (See elements checklist below)*

The written training program includes the checked elements listed below.

	Training Program Elements	**Included**
1.	System/equipment overview (what it is, what it does and with what other systems and/or equipment it interfaces)	☐
2.	Review and demonstration of servicing & preventive maintenance	☐
3.	Review of the information in the Systems Manual	☐
4.	Review of the record drawings on the system/equipment	☐

The Owner or Owner Representative attest that when the appropriate maintenance staff are made available prior to certificate of occupancy that the written training program was executed with these staff. Or, that if appropriate maintenance staff are not available, that the written training program was submitted and approved by the Owner or Owner Representative.

_____ _____

Owner or Owner Representative Signature Date

SYSTEM OPERATIONS TRAINING COMPLIANCE FORM-ELEMENTS	

THIS FORM IS TO BE COMPLETED PRIOR TO INSPECTION

Project Address: _____

Permit Number: _____

Part One: System Manual

ITEM #	SYSTEM MANUAL ELEMENTS	PAGE NUMBER IN MANUAL
	SITE INFORMATION	
1	General (i.e. address, acreage, local utility information, other)	
2	Facility description (i.e. use/function, square footage, occupancy type, construction type, basis of design, location of major systems & equipment)	
3	Project history (i.e. project requirements (BOD/OPR), project undocumented events, record drawings & documents, final control drawings & schematics, final control sequences, construction documents)	
4	Current requirements (i.e. building operating schedules, space temperature, humidity, pressure, CO_2 setpoints, summer and winter setback schedules, chilled and hot water temperatures, As-built control setpoints & parameters)	
	SITE CONTACT INFORMATION	
5	Owner Information	
6	Emergency contacts	
7	Design Team (i.e. architect, mechanical engineer, electrical engineer, other)	
8	Prime Contractor contact information	
9	Subcontractor information	
10	Equipment supplier contact information	
	BASIC OPERATIONS & MAINTENANCE	
11	Basic operation (i.e. narratives of basic equipment operation, interfaces, interlocks & interaction with other equipment & systems, initial maintenance provided by the contractor)	
12	General site operating schedules (i.e. instructions for changes in major system operating schedules, instructions for changes in major system holiday & weekend schedules)	
13	Basic troubleshooting (i.e. cite recommended troubleshooting procedures specific to major systems & equipment, manual operation procedures, standby/backup/bypass operation procedures, major system power fail resets and restarts, trend log listing)	
14	Recommended maintenance events log (i.e. HVAC air filler replacement schedule & log, building control system sensor calibration schedule & log)	
15	Operation & maintenance manuals (location or delivery information)	
	MAJOR SYSTEMS	
19	Water Heating Systems	
20	Landscape irrigation systems (i.e. water distribution diagrams, and control system)	
21	Water reuse systems (i.e. reclaimed water system for indoor use, reclaimed water for irrigation use)	
	SITE EQUIPMENT INVENTORY & MAINTENANCE NOTES	

22	Spare parts inventory	
23	Frequently required parts and supplies	
24	Special equipment required to operate or maintain systems	
25	Special tools required to operate or maintain systems	
	SPECIAL INSPECTIONS	
26	Copies of all special inspection verifications required by the enforcing agency of this code	
	OTHER	
27	Other resources and documentation	

Part Two: Training

ITEM #	TRAINING PROGRAM ELEMENTS	PAGE NUMBER IN TRAINING DOCUMENT
1	System/equipment overview (i.e. what it is, what it does, and with what other systems and/or equipment it interfaces)	
2	Review and demonstration of servicing & preventative maintenance	
3	Review of the information in the Systems Manual	
4	Review of the record drawings on the system/equipment	

Owner/Owner Representative Acknowledgment

☐ Documentation of the operation aspects of the building shall be completed within the systems manual and delivered to the building owner or representative and facilities operator. The Systems Manual includes the elements listed in part one of this form; or

☐ When the appropriate maintenance staff is made available prior to the certificate of occupancy, the written training program will be executed to these staff. The written training program includes the elements listed in part two of this form.

Name: _____ ☐ Owner ☐ Owner's Representative

Company Name (if applicable): _____

Signature: _____ Date: _____

Commissioning Report **Compliance Form**	

CALGreen Commissioning Requirement 5.410.2.6 Commissioning Report

5.410.2.6 Commissioning Report. [N] *A report of commissioning process activities undertaken through the design and construction phases of the building project shall be completed and provided to the owner or representative.*

The commissioning report should include the checked elements listed below and should be approved by the Owner or Owner's Representative.

	Commissioning Report Elements	**Included**
1.	Executive summary with conclusions and outstanding issues	☐
2.	History of system deficiencies and resolution	☐
3.	Summary of system functional test results	☐
4.	Summary of training completion	☐
5.	Attachments of Commissioning plan, OPR, BOD, executed (filled in) installation checklists, executed functional tests, recommendations for end-of-warranty review	☐

_____ _____

Owner / Owner's Representative Signature Date

COMMISSIONING REPORT **COMPLIANCE FORM-ELEMENTS**	

THIS FORM IS TO BE COMPLETED PRIOR TO INSPECTION

Project Address: _____

Permit Number: _____

ITEM #	COMMISSIONING REPORT ELEMENTS	PAGE NUMBER IN COMMISSIONING REPORT DOCUMENT
	EXECUTIVE SUMMARY	
1	Executive summary of process and results of commissioning program (include observations, conclusions, and any outstanding items)	
	HISTORY OF ANY SYSTEM DEFICIENCIES AND HOW RESOLVED	
6	Outstanding deficiencies and plans for resolution	
7	Plans for seasonal testing scheduled for a later date	
	RESULTS	
8	System performance test results and evaluations	
	SUMMARY OF TRAINING	
9	Summary of training process completed and scheduled	
	ATTACH COMMISSIONING PROCESS DOCUMENTS	
10	Commissioning Plan	
11	Owner's Project Requirements (OPR)	
12	Basis of Design (BOD)	
13	Executed installation checklists	
14	Executed Functional Performance Test (FPT) forms	
15	Recommendations for end-of-warranty review activities	

Owner & Commissioning Agent Acknowledgment

The commissioning report includes the items listed above and is approved by the owner/owner's representative and commissioning agent below.

1. Owner/Owner's Representative

The commissioning report includes the items listed above and have been approved by the Owner or Owner's Representative.

Name: _____ ☐ Owner ☐ Owner's Representative

Company Name (if applicable): _____

Signature: _____ Date: _____

2. Commissioning Agent

Name: _____

Company Name (if applicable: _____

Signature: _____ Date: _____

COMPLIANCE FORMS, WORKSHEETS AND REFERENCE MATERIAL-CONTNUED
[Note to code user: the tables shown below are new to the CALGreen Code are to be used in conjunction with code Section 5.106.8]

FOR REFERENCE ONLY: The following Table has been reprinted from the IES TM-15-11 Reference standard, see Section 5.106.8.

IES TM-15-11 TABLE A-1 Backlight Ratings (Maximum Zonal Lumens)

Secondary Solid Angle	**Maximum Zonal Lumens per Outdoor Lighting Zone**				
	LZ0	LZ 1	LZ 2	LZ 3	LZ 4
Backlight High (BH) 60 to 80 degrees	110	500	1000	2500	5000
Backlight Medium (BM) 30 to <60 degrees	220	1000	2500	5000	8500
Backlight Low (BL) 0 to < 30 degrees	110	500	1000	2500	5000

FOR REFERENCE ONLY: The following Table has been reprinted from the *California Energy Code, Part 6 Title 24,* see Section 5.106.8.

TABLE 130.2-A Uplight Ratings (Maximum Zonal Lumens)

Secondary Solid Angle	**Maximum Zonal Lumens per Outdoor Lighting Zone**				
	LZ0	LZ 1	LZ 2	LZ 3	LZ 4
Uplight High (UH) 100 to 180 degrees	0	10	50	500	1,000
Uplight Low (UL) 90 to <100 degrees	0	10	50	500	1,000

FOR REFERENCE ONLY: The following Table has been reprinted from the *California Energy Code, Part 6 Title 24,* see Section 5.106.8.

TABLE 130.2-BGlare Ratings (Maximum Zonal Lumens)

	Glare Rating for Asymmetrical Luminaire Types (Type 1, Type II, Type III, Type IV)				
Secondary Solid Angle		**Maximum Zonal Lumens per Outdoor Lighting Zone**			
	LZ 0	LZ 1	LZ 2	LZ 3	LZ 4

Forward Very High (FVH) 80 to 90 degrees	10	100	225	500	750
Backlight Very High (BVH) 80 to 90 degrees	10	100	225	500	750
Forward High (FH) 60 to <80 degrees	660	1,800	5,000	7,500	12,000
Backlight High (BH) 60 to <80 degrees	110	500	1,000	2,500	5,000
	Glare Rating for Quadrilateral Symmetrical Luminaire Types (Type V, Type V Square)				
		Maximum Zonal Lumens per Outdoor Lighting Zone			
Secondary Solid Angle	LZ 0	LZ 1	LZ 2	LZ 3	LZ 4
Forward Very High (FVH) 80 to 90 degrees	10	100	225	500	750
Backlight Very High (BVH) 80 to 90 degrees	10	100	225	500	750
Forward High (FH) 60 to <80 degrees	660	1,800	5,000	7,500	12,000
Backlight High (BH) 60 to <80 degrees	660	1,800	5,000	7,500	12,000

The following is a supplement to page 166 of the Guide

APPENDIX A5
NONRESIDENTAIL VOLUNTARY MEASURES
SECTION A5.106
SITE DEVELOPMENT

A5.106.2 Storm water design. Design storm water runoff rate, quantity, and quality in conformance with Section A5.106.3 Low Impact Development (LID) or by local requirements, whichever are stricter.

~~A5.106.2.1 Storm water runoff rate and quantity.~~ Repealed

~~A5.106.2.2 Storm water runoff quality.~~ Repealed

A5.106.3 Low Impact Development (LID). All newly constructed projects shall mitigate (infiltrate, filter or treat) stormwater runoff from the 85th percentile 24-hour runoff event (for volume-based

BMP's) or the runoff produced by a rain event equal to two times the 85th percentile hourly intensity (for flow-based BMP's) through the application of (LID) strategies. Employ at least two of the following methods or other best management practices to allow rainwater to soak into the ground, evaporate into the air or collect in storage receptacles for irrigation or other beneficial uses. LID strategies include, but are not limited to:

1. Bioretention (rain gardens) / filtration planters;
2. Precipitation capture (Cisterns and rain barrels);
3. Green roofs meeting the structural requirements of the building code;
4. Roof leader or impervious area disconnection;
5. Permeable and porous paving;
6. Vegetative swales and filter strips;
7. Tree preservation and tree plantings;
8. Landscaping soil quality;
9. Stream buffer; and
10. Volume retention suitable for previously developed sites.

The following is a supplement to page 191 of the Guide

Division A5.3 - WATER EFFICIENCY AND CONSERVATION
SECTION A5.303
INDOOR WATER USE

…

A5.303.4 Water conserving plumbing fixtures and fittings.

A5.303.4.1 Nonwater supplied urinals. Nonwater supplied urinals as installed in accordance with the California Plumbing Code.

Where approved, ~~hybrid urinals,~~ urinal, hybrids, as defined in Chapter 2 shall be considered waterless urinals.

Division A5.6 – VOLUNTARY TIERS

SECTION A5.601
CALGreen TIER 1 AND TIER 2

A5.601.1 Scope.

The measures contained in this appendix are not mandatory unless adopted by local government as specified in Section 101.7. The provisions of this section outline means of achieving enhanced construction or reach levels by incorporating additional green building measures for newly constructed nonresidential buildings as well as additions and alterations. In order to meet one of the tier levels designers, builders or property owners are required to incorporate additional green building measures necessary to meet the threshold of each level. Refer to the provisions in Section 301.3 for nonresidential additions and alterations scope and application.

A5.601.4 Compliance verification. **…**

A5.601.4 Compliance verification. **…**

The following is a supplement to page 234 of the Guide

TABLE A5.601 NONRESIDENTIAL BUILDINGS:
Green Building Standards Code Proposed Performance Approach

Note: This table is intended only as an aid in illustrating the nonresidential tier structure

(Refer to Checklists A5.602, A5.602.1 and A5.602.2 for CALGreen Verification guidelines for Mandatory Checklist, Tier 1 Checklist and Tier 2 Checklist)

CATEGORY	ENVIRONMENTAL PERFORMANCE GOAL	TIER 1	TIER 2
All	Minimum Mandatory (See Mandatory Checklist)	Meet all of the provisions of Chapter 5 (See Tier 1 Checklist)	Meet all of the provision of Chapter 5 (See Tier 2 Checklist)
DIVISION 5.1 **Planning and Design**	Designated Parking for Fuel Efficient Vehicles	Approx. 10% of total spaces	Appox.12% of total spaces
	Electric Vehicle Charging	Approx. 8% of total spaces	Approx. 10% of total spaces
	Cool Roof to Reduce Heat Island Effect	Roof Slope < 2:12 SRI 75 Roof Slope > 2:12 SRI 16	Roof Slope < 2:12 SRI 82 Roof Slope > 2:12 SRI 27
		1 additional Elective from Division A5.1	3 additional Electives from Division A5.1
DIVISION 5.2 **Energy Efficiency**	Energy Performance[2a,2b]	Outdoor lighting power 90% of Part 6 allowance	Outdoor lighting power 90% of Part 6 allowance
		If applicable, solar water-heating system with minimum solar savings fraction of 0.15	If applicable, solar water-heating system with minimum solar savings fraction of 0.15
		If applicable, certain functional areas comply with residential indoor lighting requirements	If applicable, certain functional areas comply with residential indoor lighting requirements
		Energy Budget 95% or 90% of Part 6 calculated value of allowance	Energy Budget 90% or 85% of Part 6 calculated value of allowance
DIVISION 5.3 **Water Efficiency**	Indoor Water Use	12% Savings	20% Savings
		1 additional Elective from	3 additional Electives

DIVISION 5.4 Material Conservation and	Construction Waste Reduction	At least 65% reduction	At least 80% reduction
	Recycled Content	Utilize recycled content materials for 10% of total material cost	Utilize recycled content materials for 15% of total material cost
		1 additional Elective from Division A5.4	3 additional Electives from Division A5.4
DIVISION 5.5 Environmental Quality	Low-VOC Resilient Flooring	90% of flooring meets VOC limits	100% of flooring meets VOC limits[1]
	Low-VOC Thermal Insulation	Comply with VOC limits	Install no-added formaldehyde insulation and comply with VOC limits
		1 additional Elective from Division A5.5	3 additional Electives from Division A5.5
Additional Measures	Added measures shall be achieved across at least 3 categories	1 additional Elective	3 additional Electives from any division
Approximate Total		15	25

1. Exception: Allowance may be permitted in Tier 2 for up to 5-percent specialty purpose flooring.
2. Solar water-heating system requirement for newly constructed restaurants as per A5.203.1.1.2.

   Exceptions:

   a. Buildings with a natural gas service water heater with a minimum of 95-percent thermal efficiency.
   b. Buildings where greater than 75 percent of the total roof area has annual solar access that is less than 70 percent. Solar access is the ratio of solar insolation including shade to the solar insolation without shade. Shading from obstructions located on the roof or any other part of the building shall not be included in the determination of annual solar access.
3. Life cycle assessment compliant with Section A5.409.4 in this code may be substituted for prescriptive measures from Division A5.4.

[Code user: Entire Section A5.602, pages 124-138 of the 2016 CALGreen Code have been repealed and replaced with new checklists Mandatory, Tier 1 and Tier 2]

SECTION A5.602

NONRESIDENTIAL OCCUPANCIES APPLICATION CHECKLISTS[4]

5.508.2 Supermarket refrigerant leak reduction. New commercial refrigeration systems shall comply with the provisions of this section when installed in retail food stores 8,000 square feet or more conditioned area, and that utilize either refrigerated display cases, or walk-in coolers or freezers connected to remote compressor units or condensing units. The leak reduction measures apply to refrigeration systems containing high-global- warming potential (high-GWP) refrigerants with a GWP of 150 or greater. New refrigeration systems include both new facilities and the replacement of existing refrigeration systems in existing facilities. **Exception:** Refrigeration systems containing low-global warming potential (low-GWP) refrigerant with a GWP value less than 150 are not subject to this section. Low-GWP refrigerants are nonozone-depleting refrigerants that include ammonia, carbon dioxide (CO_2), and potentially other refrigerants.	☐ As applicable		

APPLICATION CHECKLIST FOR BSC	MANDATORY	VOLUNTARY[1]	
		CALGreen Tier 1	*CALGreen* Tier 2
Requirements			
Project meets all of the requirements of Divisions 5.1 through 5.5.	☐	☐	☐
Planning and Design			
Site Selection			

1. Green building measures in this table may be mandatory if adopted by a city, county, or city and county as specified in Section 101.7.

2. Required prerequisite for this Tier.

3. These measures are currently required elsewhere in statute or in regulation.

4. This application checklist is non-regulatory, intended only as an aid to the user and may not contain complete code language. Refer to Chapter 5 and Appendix Chapter A5 for complete code provision

Tables A5.602 Mandatory Checklist, Table A5.602.1 Tier 1 Checklist and Table A5.602.2 Tier 2 Checklist

A5.602
CALGreen VERIFICATION GUIDELINES
MANDATORY MEASURES CHECKLIST

Application: This checklist shall be used for non-residential projects that meet one of the following: new construction, building additions of 1,000 sq. ft. or greater or building alterations with a permit valuation of $200,000 or more pursuant to section 301.3 AND do not trigger a Tier 1 or Tier 2 requirement:

Y = Yes (section has been selected and/or included)
N/A = Not Applicable (Code section does not apply to the project, mainly used for additions and alterations)
O = Other (provide explanation)
[N]=New construction pursuant to section 301.3
[A]=Additions and/or Alterations pursuant to section 301.3

CHAPTER 5 DIVISIONS		SECTION TITLE	CODE SECTION	Y	N/A	O	Plan sheet, Spec or Attach Reference
DIVISION 5.1 Planning and Design	Mandatory	Storm Water Pollution Prevention for projects that disturb less than one acre of land	5.106.1 through 5.106.2				
	Mandatory	Short Term Bicycle Parking w/ exception	5.106.4.1.1				
	Mandatory	Long Term Bicycle Parking	5.106.4.1.2 through 5.106.4.1.5				
	Mandatory	Designated Parking	5.106.5.2				
	Mandatory	Parking stall marking	5.106.5.2.1				
	Mandatory	Single Charging space requirements	5.106.5.3.1				
	Mandatory	Multiple Charging space requirements	5.106.5.3.2				
	Mandatory	EV charging space calculation [N] w/ exceptions	5.106.5.3.3				
	Mandatory	[N] Identification	5.106.5.3.4				
	Mandatory	[N] Future charging spaces w/ notes 1-3	5.106.5.3.5				
	Mandatory	Light Pollution Reduction [N] w/ exceptions and note	5.106.8				
	Mandatory	Grading and Paving, Exception for Additions and Alterations not altering the	5.106.10				
DIVISION 5.2 Energy Efficiency	Mandatory	Meet the minimum Energy Efficiency Standard	5.201.1				
DIVISION 5.3	Mandatory	Separate Meters (new Buildings or additions > 50,000 SF that consume more	5.303.1.1				
Water Efficiency And	Mandatory	Separate Meters (for tenants in new buildings or additions that consume more than 1,000 gal/day)	5.303.1.2				

Conservation	Mandatory	Water closets shall not exceed 1.28 gallons per flush	5.303.3.1				
	Mandatory	Wall-mounted urinals shall not exceed 0.125 gpf	5.303.3.2.1				
	Mandatory	Floor-mounted urinals shall not exceed 0.5 gpf	5.303.3.2.2				
	Mandatory	Single showerhead shall have maximum flow rate of 1.8 gpm (gallons per minute) at 80 psi	5.303.3.3.1				
	Mandatory	Multiple showerheads serving one shower shall have a combined flow rate of 1.8 gpm at 80 psi	5.303.3.3.2				
	Mandatory	Nonresidential lavatory faucets	5.303.3.4.1				
	Mandatory	Kitchen faucets	5.303.3.4.2				
	Mandatory	Wash basins	5.303.3.4.3				
	Mandatory	Metering faucets	5.303.3.4.4				
	Mandatory	Metering faucets for wash fountains	5.303.3.4.5				
	Mandatory	Food waste disposers	5.303.4.1				
	Mandatory	Areas of additions and alterations	5.303.5				
	Mandatory	Standards for plumbing fixtures and fittings	5.303.6				
	Mandatory	Outdoor water use in landscape areas equal to or greater than 500 sf	5.304.2				
	Mandatory	Outdoor water use in rehabilitated landscape projects with areas equal to or greater than 2,500 sf	5.304.3				
	Mandatory	Outdoor water use in landscape areas of 2,500 sf or less	5.304.4				
	Mandatory	Graywater or rainwater use in landscaped areas	5.304.5				
DIVISION 5.4 **Material Conservation and Resource Efficiency**	Mandatory	Weather Protection	5.407.1				
	Mandatory	Moisture Control: sprinklers	5.407.2.1				
	Mandatory	Moisture Control: Exterior door protection	5.407.2.2.1				
	Mandatory	Moisture Control: Flashing	5.407.2.2.2				
	Mandatory	Construction waste management-comply with either: sections 5.408.1.1, 5.408.1.2, 5.408.1.3 or more stringent local ordinance	5.408.1.1, 5.408.1.2, 5.408.1.3				
	Mandatory	Construction waste management: Documentation	5.408.1.4				
	Mandatory	Universal Waste [A]	5.408.2				
	Mandatory	Excavated soil and land clearing debris (100% reuse or recycle)	5.408.3				
	Mandatory	Recycling by Occupants w/ exception	5.410.1				
	Mandatory	Recycling by Occupants: Additions w/ exception	5.410.1.1				
	Mandatory	Recycling by Occupants: Sample ordinance	5.410.1.2				
	Mandatory	Commissioning new buildings (≥ 10,000 SF) [N]	5.410.2				

	Mandatory	Owner's or Owner representative's Project Requirements (OPR) [N]	5.410.2.1				
	Mandatory	Basis of Design (BOD) [N]	5.410.2.2				
	Mandatory	Commissioning Plan [N]	5.410.2.3				
	Mandatory	Functional Performance Testing [N]	5.410.2.4				
	Mandatory	Documentation and Training [N]	5.410.2.5				
	Mandatory	Systems Manual [N]	5.410.2.5.1				
	Mandatory	Systems Operation Training) [N]	5.410.2.5.2				
	Mandatory	Commissioning Report [N]	5.410.2.6				
	Mandatory	Testing and adjusting for new buildings < 10,000 SF or new systems that serve additions or alterations. [A]	5.410.4				
	Mandatory	System Testing Plan for HVAC, Lighting, water heating, renewable energy, landscape irrigation and water reuse. [A]	5.410.4.2				
	Mandatory	Procedures for testing and adjusting	5.410.4.3				
	Mandatory	Procedures for HVAC balancing	5.410.4.3.1				
	Mandatory	Reporting for testing and adjusting	5.410.4.4				
	Mandatory	Operation and Maintenance (O&M) Manual	5.410.4.5				
	Mandatory	Inspection and reports	5.410.4.5.1				
DIVISION 5.5 **Environmental Quality**	Mandatory	Fireplaces	5.503.1				
	Mandatory	Woodstoves	5.503.1.1				
	Mandatory	Temporary ventilation	5.504.1				
	Mandatory	Covering of ducts openings and protection of mechanical equipment during	5.504.3				
	Mandatory	Adhesives, sealants and caulks	5.504.4.1				
	Mandatory	Paints and coatings	5.504.4.3				
	Mandatory	Aerosol paints and coatings	5.504.4.3.1				
	Mandatory	Aerosol paints and coatings: Verification	5.504.4.3.2				
	Mandatory	Carpet systems	5.504.4.4				
	Mandatory	Carpet cushion	5.504.4.4.1				
	Mandatory	Carpet adhesives per table 5.504.4.1	5.504.4.4.2				
	Mandatory	Composite wood products	5.504.4.5				
	Mandatory	Composite wood products: Documentation	5.504.4.5.3				
	Mandatory	Resilient flooring systems	5.504.4.6				
	Mandatory	Resilient flooring: Verification of compliance	5.504.4.6.1				
	Mandatory	Filters w/ exceptions	5.504.5.3				
	Mandatory	Filters: Labeling	5.504.5.3.1				
	Mandatory	Environmental tobacco smoke (ETS) control	5.504.7				

	Mandatory	Indoor moisture control	5.505.1				
	Mandatory	Outside air delivery	5.506.1				
	Mandatory	Carbon dioxide (CO2) monitoring	5.506.2				
	Mandatory	Acoustical control w/ exception	5.507.4				
	Mandatory	Exterior noise transmission, prescriptive method w/ exceptions	5.507.4.1				
	Mandatory	Noise exposure where noise contours are not readily available	5.507.4.1.1				
	Mandatory	Performance method	5.507.4.2				
	Mandatory	Site features	5.507.4.2.1				
	Mandatory	Documentation of compliance	5.507.4.2.2				
	Mandatory	Interior sound transmission w/ note	5.507.4.3				
	Mandatory	Ozone depletion and greenhouse gas reductions	5.508.1				
	Mandatory	Chlorofluorocarbons (CFCs)	5.508.1.1				
	Mandatory	Halons	5.508.1.2				
	Mandatory	Supermarket refrigerant leak reduction for retail food stores 8,000 square feet or more sections 5.508.2 through 5.508.2.6.3	5.508.2 through 5.508.2.6.3				
		END OF MANDATORY PROVISIONS					

Documentation Author's /Responsible Designer's Declaration Statement □ **Mandatory:** I attest that this mandatory provisions checklist is accurate and complete.	
Signature:	
Company:	Date:
Address:	License:
City/State/Zip:	Phone:

A5.602.1
CALGreen VERIFICATION GUIDELINES
TIER 1 CHECKLIST

Application: This checklist shall be used for nonresidential projects that meet the following: new construction, or building additions of 1,000 sq. ft. or greater, or building alterations with a permit valuation of $200,000 or more pursuant to section 5.301.3, AND are adopting Tier 1 voluntary measures.

Note: All applicable mandatory requirements in chapter 5 shall be met prior to applying Tier 1 voluntary measures.

Instructions:
Comply with all Tier prerequisite measures from the various categories shown on the table below.
Add a **"Y"** to all Mandatory and Tier 1 prerequisite provisions in the appropriate columns.
Select the required number of additional electives from those categories shown on the table below and add a **"Y"** on the selected elective and add an **"N"** on the rest.
Count the total number of Tier 1 prerequisite measures plus the additional electives and write down the total number at the end of the checklist. Determine if the required number of Tier 1 measures have been selected to achieve Tier 1 compliance.

Y=Yes (section has been selected and/or included)
N=No (section has not been selected and/or included)
O=Other (provide explanation)
[N]=New construction pursuant to section 301.3
[A]=Additions and/or Alterations pursuant to section 301.3

CHAPTER 5 DIVISIONS		SECTION TITLE	CODE SECTION	Y	N	O	Plan sheet, Spec or Attach Reference
DIVISION 5.1 Planning and Design	Mandatory	Storm Water Pollution Prevention for projects that disturb less than one acre of land	5.106.1 through 5.106.2				
	Mandatory	Short Term Bicycle Parking	5.106.4.1.1				
	Mandatory	Long Term Bicycle Parking	5.106.4.1.2 through 5.106.4.1.5				
	Mandatory	Designated Parking	5.106.5.2				
	Tier 1 Prerequisites	*Designated parking—10% of parking capacity w/ parking stall markings and stall identification*	*A5.106.5.1, A5.106.5.1.1, A5.106.5.1.3, A5.106.5.1.4*				
	Mandatory	Parking stall marking	5.106.5.2.1				
	Mandatory	Single Charging space requirements	5.106.5.3.1				
	Mandatory	Multiple Charging space requirements	5.106.5.3.2				
	Tier 1 Prerequisites	*Electric vehicle (EV) charging [N] w/ associated electrical panel identification and designated parking allowance*	*A5.106.5.3, A5.106.5.3.1, A5.106.5.3.3, A5.106.5.3.4*				
	Mandatory	EV charging space calculation [N] w/	5.106.5.3.3				
	Mandatory	[N] Identification	5.106.5.3.4				
	Mandatory	[N] Future charging spaces w/ notes 1-3	5.106.5.3.5				

	Mandatory	Light Pollution Reduction [N] w/ exceptions and note	5.106.8				
	Mandatory	Grading and Paving, Exception for Additions and Alterations not altering the drainage	5.106.10				
	Tier 1 Prerequisites	*Cool roof (A5.106.11.2.2): SRI 75 when ≤ 2:12, SRI 16 when > 2:12*	*A5.106.11.2*				
Select one elective from A5.1	*Electives*	*Community Connectivity*	*A5.103.1*				
	Electives	*Brownfield or Greyfield site redevelopment or infill area development.*	*A5.103.2*				
	Electives	*Reduce development footprint and optimize open space.*	*A5.104.1*				
	Electives	*Disassemble and Reuse Existing Building Structure (70%)*	*A5.105.1.1*				
	Electives	*Disassemble and Reuse Existing Non-Structure elements (50%)*	*A5.105.1.2*				
	Electives	*Salvage*	*A5.105.1.3*				
	Electives	*Storm Water Design*	*A5.106.2*				
	Electives	*Low Impact Development (LID)*	*A5.106.3*				
	Electives	*Changing rooms*	*A5.106.4.3*				
	Electives	*Parking Capacity*	*A5.106.6*				
	Electives	*Exterior Wall Shading*	*A5.106.7*				
	Electives	*Heat island Effect*	*A5.106.11*				
DIVISION 5.2 Energy Efficiency	Mandatory	Meet the minimum Energy Efficiency Standard	5.201.1				
	Tier 1 Prerequisites	*Energy Performance Outdoor lighting power 90% of Part 6*	*A5.203.1.1.1*				
	Tier 1 Prerequisites	*If applicable, Service for water heating in restaurants 8,000 sf or greater*	*A5.203.1.1.2*				
	Tier 1 Prerequisites	*Energy Budget 95% or 90% of Part 6 calculated value of allowance*	*A5.203.1.2.1*				
	Elective	*On-site renewable energy w/ documentation*	*A5.211.1 A5.211.1.1*				
	Elective	*Green power*	*A5.211.3*				
	Elective	*Elevators w/ car lights and fan*	*A5.212.1.1 A5.212.1.1.1*				
	Elective	*Escalators*	*A5.212.1.2*				
	Elective	*Controls that reduce energy*	*A5.212.1.4*				
	Elective	*Steel framing*	*A5.213.1*				
DIVISION 5.3 Water Efficiency and Conservation	Mandatory	Separate Meters (new Buildings or additions > 50,000 SF that consume more than 100 gal/day)	5.303.1.1				
	Mandatory	Separate Meters (for tenants in new buildings or additions that consume more than 1,000 gal/day)	5.303.1.2				
	Tier 1 Prerequisites	*Water Reduction Tier 1. 12% savings over the "water use baseline" Table A5.303.2.2 or Meet table A5.303.2.3.1*	*A5.303.2.3.1*				

	Mandatory	Water closets shall not exceed 1.28 gallons per flush (gpf)	5.303.3.1				
	Mandatory	Wall-mounted urinals shall not exceed 0.125 gpf	5.303.3.2.1				
	Mandatory	Floor-mounted urinals shall not exceed 0.5	5.303.3.2.2				
	Mandatory	Single showerhead shall have maximum flow rate of 1.8 gpm (gallons per minute) at 80 psi	5.303.3.3.1				
	Mandatory	Multiple showerheads serving one shower shall have a combined flow rate of 1.8 gpm at 80 psi	5.303.3.3.2				
	Mandatory	Nonresidential lavatory faucets	5.303.3.4.1				
	Mandatory	Kitchen faucets	5.303.3.4.2				
	Mandatory	Wash basins	5.303.3.4.3				
	Mandatory	Metering faucets	5.303.3.4.4				
	Mandatory	Metering faucets for wash fountains	5.303.3.4.5				
	Mandatory	Food waste disposers	5.303.4.1				
	Mandatory	Areas of additions and alterations	5.303.5				
	Mandatory	Standards for plumbing fixtures and fittings	5.303.6				
	Mandatory	Outdoor water use in landscape areas equal to or greater than 500 sf	5.304.2				
	Mandatory	Outdoor water use in rehabilitated landscape projects with areas equal to or greater than 2,500 sf	5.304.3				
	Mandatory	Outdoor water use in landscape areas of 2,500 sf or less	5.304.4				
	Mandatory	Graywater or rainwater use in landscaped	5.304.5				
	Elective	*Nonpotable water systems for indoor use*	*A5.303.2.3.4*				
	Elective	*Appliances and fixtures for commercial application*	*A5.303.3*				
	Elective	*Nonwater supplied urinals*	*A5.303.4.1*				
	Elective	*Dual plumbing*	*A5.303.5*				
	Elective	*Outdoor potable water use*	*A5.304.2.1*				
Select one elective from A5.3	*Elective*	*Restoration of areas disturbed by construction*	*A5.304.6*				
	Elective	*Previously developed sites w/ exception*	*A5.304.7*				
	Elective	*Graywater irrigation system*	*A5.304.8*				
	Elective	*Nonpotable water systems*	*A5.305.1*				
	Elective	*Irrigation systems*	*A5.305.2*				
DIVISION 5.4 **Material Conserva-tion and Resource Efficiency**	*Tier 1 Prerequisites*	*Recycled content for10% of total material cost*	*A5.405.4* *A5.405.4.1 Through A5.405.4.5*				
	Mandatory	Weather Protection	5.407.1				
	Mandatory	Moisture Control: sprinklers	5.407.2.1				
	Mandatory	Moisture Control: Exterior door protection	5.407.2.2.1				
	Mandatory	Moisture Control: Flashing	5.407.2.2.2				
	Mandatory	Construction waste management-comply with either: sections 5.408.1.1, 5.408.1.2, 5.408.1.3 or more stringent local ordinance	5.408.1.1, 5.408.1.2, 5.408.1.3				

	Mandatory	Construction waste management: Documentation	5.408.1.4				
	Mandatory	Universal Waste [A]	5.408.2				
	Mandatory	Excavated soil and land clearing debris (100% reuse or recycle)	5.408.3				
	Tier 1 Prerequisites	*Enhanced construction waste reduction 65% –Tier 1 w/ verification w/ verification*	*A5.408.3.1 A5.408.3.1.2*				
	Mandatory	Recycling by Occupants w/ exception	5.410.1				
	Mandatory	Recycling by Occupants: Additions w/ exception	5.410.1.1				
	Mandatory	Recycling by Occupants: Sample ordinance	5.410.1.2				
	Mandatory	Commissioning new buildings (≥ 10,000 SF) [N]	5.410.2				
	Mandatory	Owner's or Owner representative's Project Requirements (OPR) [N]	5.410.2.1				
	Mandatory	Basis of Design (BOD) [N]	5.410.2.2				
	Mandatory	Commissioning Plan [N]	5.410.2.3				
	Mandatory	Functional Performance Testing [N]	5.410.2.4				
	Mandatory	Documentation and Training [N]	5.410.2.5				
	Mandatory	Systems Manual [N]	5.410.2.5.1				
	Mandatory	Systems Operation Training) [N]	5.410.2.5.2				
	Mandatory	Commissioning Report [N]	5.410.2.6				
	Mandatory	Testing and adjusting for new buildings < 10,000 SF or new systems that serve additions or alterations. [A]	5.410.4				
	Mandatory	System Testing Plan for HVAC, Lighting, water heating, renewable energy, landscape irrigation and water reuse. [A]	5.410.4.2				
	Mandatory	Procedures for testing and adjusting	5.410.4.3				
	Mandatory	Procedures for HVAC balancing	5.410.4.3.1				
	Mandatory	Reporting for testing and adjusting	5.410.4.4				
	Mandatory	Operation and Maintenance (O&M) Manual	5.410.4.5				
	Mandatory	Inspection and reports	5.410.4.5.1				
	Elective	*Wood framing or OVE w/ note*	*A5.404.1, A5.404.1.1, A5.404.1.2*				
	Elective	*Regional materials*	*A5.405.1*				
	Elective	*Bio-based materials*	*A5.405.2*				
	Elective	*Rapidly renewable materials*	*A5.405.2.2*				
Select one elective from A5.4	*Elective*	*Reused materials w/ note*	*A5.405.3*				
	Elective	*Cement and concrete: Cement*	*A5.405.5.1*				
	Elective	*Cement and concrete: Concrete /w SCM & Mix design equation*	*A5.405.5.2 A5.405.5.2.1 A5.405.5.2.1.1*				

	Elective	*Cement and concrete: Additional means of compliance*	*A5.405.5.3* *A5.405.5.3.1* *A5.405.5.3.1.1* *A5.405.5.3.1.2* *A5.405.5.3.2* *A5.405.5.3.2.1* *A5.405.5.3.2.2* *A5.405.5.3.2.3* *A5.405.5.3.2.4*				
	Elective	*Choice of materials*	*A5.406.1* *A5.406.1.1* *A5.406.1.2* *A5.406.1.3*				
	Elective	*Life cycle assessment: General*	*A5.409.1*				
	Elective	*Whole building life cycle assessment*	*A5.409.2* *A5.409.2.1* *A5.409.2.2*				
	Elective	*Materials and system assemblies*	*A5.409.3*				
	Elective	*Substitution for prescriptive standards*	*A5.409.4*				
	Elective	*Verification of compliance*	*A5.409.5*				
DIVISION 5.5 **Environmental Quality**	Mandatory	Fireplaces	5.503.1				
	Mandatory	Woodstoves	5.503.1.1				
	Mandatory	Temporary ventilation	5.504.1				
	Mandatory	Covering of ducts openings and protection of mechanical equipment during construction	5.504.3				
	Mandatory	Adhesives, sealants and caulks	5.504.4.1				
	Mandatory	Paints and coatings	5.504.4.3				
	Mandatory	Aerosol paints and coatings	5.504.4.3.1				
	Mandatory	Aerosol paints and coatings: Verification	5.504.4.3.2				
	Mandatory	Carpet systems	5.504.4.4				
	Mandatory	Carpet cushion	5.504.4.4.1				
	Mandatory	Carpet adhesives per table 5.504.4.1	5.504.4.4.2				
	Mandatory	Composite wood products	5.504.4.5				
	Mandatory	Composite wood products: Documentation	5.504.4.5.3				
	Mandatory	Resilient flooring systems	5.504.4.6				
	Mandatory	Resilient flooring: Verification of compliance	5.504.4.6.1				
	Tier 1 Prerequisites	*Resilient flooring systems, Tier 1 w/ verification*	*A5.504.4.7* *A5.504.4.7.2*				
	Tier 1 Prerequisites	*Thermal insulation, Tier 1 w/ verification of compliance*	*A5.504.4.8* *A5.504.4.8.2*				
	Mandatory	Filters w/ exceptions	5.504.5.3				
	Mandatory	Filters: Labeling	5.504.5.3.1				

	Mandatory	Environmental tobacco smoke (ETS) control	5.504.7				
	Mandatory	Indoor moisture control	5.505.1				
	Mandatory	Outside air delivery	5.506.1				
	Mandatory	Carbon dioxide (CO2) monitoring	5.506.2				
	Mandatory	Acoustical control w/ exception	5.507.4				
	Mandatory	Exterior noise transmission, prescriptive method	5.507.4.1				
	Mandatory	Noise exposure where noise contours are not readily available	5.507.4.1.1				
	Mandatory	Performance method	5.507.4.2				
	Mandatory	Site features	5.507.4.2.1				
	Mandatory	Documentation of compliance	5.507.4.2.2				
	Mandatory	Interior sound transmission w/ note	5.507.4.3				
	Mandatory	Ozone depletion and greenhouse gas	5.508.1				
	Mandatory	Chlorofluorocarbons (CFCs)	5.508.1.1				
	Mandatory	Halons	5.508.1.2				
	Mandatory	Supermarket refrigerant leak reduction for retail food stores 8,000 square feet or more sections 5.508.2 through 5.508.2.6.3	5.508.2 through 5.508.2.6.3				
	Elective	*Indoor air quality (IAQ) during construction*	*A5.504.1* *A5.504.1.1* *A5.504.1.2*				
	Elective	*IAQ postconstruction*	*A5.504.2*				
	Elective	*IAQ testing*	*A5.504.2.1* *A5.504.2.1.1* *A5.504.2.1.2* *A5.504.2.1.3*				
	Elective	*No added formaldehyde Tier 1 w/ notes*	*A5.504.4.5.1*				
	Elective	*Acoustical ceilings and wall panels w/ verification of compliance*	*A5.504.4.9* *A5.504.4.9.1*				
Select one elective from A5.5	*Elective*	*Hazardous particulates and chemical pollutants*	*A5.504.5*				
	Elective	*Entryway systems*	*A5.504.5.1*				
	Elective	*Isolation of pollutant sources*	*A5.504.5.2*				
	Elective	*Filters, Tier 1*	*A5.504.5.3.1*				
	Elective	*Lighting and thermal comfort controls*	*A5.507.1* *A5.507.1.1 through A5.507.1.2*				
	Elective	*Daylight w/ exception*	*A5.507.2*				
	Elective	*Views w/ exception*	*A5.507.3*				
	Elective	*Interior office spaces*	*A5.507.3.1*				
	Elective	*Multi-occupant spaces*	*A5.507.3.2*				
	Elective	*Hydrochlorofluorocarbons (HCFCs)*	*A5.508.1.3*				
	Elective	*Hydrofluorocarbons (HFCs)*	*A5.508.1.4*				
Additional Measures		*Select 1 additional measure from any division*	Add section #				

Total number of measure required for Tier 1	15	
Total number of Measures selected		

Documentation Author's /Responsible Designer's Declaration Statement
Check the appropriate box(s) for the list below

- □ **Mandatory:** I attest that the mandatory provisions checklist is accurate and complete.
- □ **Tier 1compliant:** I attest that the total number of voluntary measures selected meet or exceed the total number required to achieve Tier 1compliance.
- □ **Partial Tier 1 compliant:** I attest that the total number of voluntary measures selected do not meet the total number required to achieve Tier 1compliance however partial Tier 1 compliance has been achieved.

Signature:	
Company:	Date:
Address:	License:
City/State/Zip:	Phone:

A5.602.2
CALGreen VERIFICATION GUIDELINES
TIER 2 CHECKLIST

Application: This checklist shall be used for nonresidential projects that meet the following: new construction, or building additions of 1,000 sq. ft. or greater, or building alterations with a permit valuation of $200,000 or more pursuant to section 5.301.3, AND are adopting Tier 2 voluntary measures.

Note: All applicable mandatory requirements in chapter 5 shall be met prior to applying Tier 2 voluntary measures.

Instructions:
Comply with all Tier 2 prerequisite measures from the various categories shown on the table below.
Add a **"Y"** to all Mandatory and Tier 2 prerequisite provisions in the appropriate columns.
Select the required number of additional electives from those categories shown on the table below and add a **"Y"** on the selected elective and add an **"N"** on the rest.
Count the total number of Tier 1 prerequisite) measures plus the additional electives and write down the total number at the end of the checklist. Determine if the required number of Tier 2 measures have been selected to achieve Tier 2 compliance.

Y=Yes (section has been selected and/or included)
N=No (section has not been selected and/or included)
O=Other (provide explanation)
[N]=New construction pursuant to section 301.3
[A]=Additions and/or Alterations pursuant to section 301.3

CHAPTER 5 DIVISIONS		SECTION TITLE	CODE SECTION	Y	N	O	Plan sheet, Spec or Attach Reference
DIVISION 5.1	Mandatory	Storm Water Pollution Prevention for projects that disturb less than one acre of land	5.106.1 through 5.106.2				

Planning and Design	Mandatory	Short Term Bicycle Parking	5.106.4.1.1				
	Mandatory	Long Term Bicycle Parking	5.106.4.1.2 through 5.106.4.1.5				
	Mandatory	Designated Parking	5.106.5.2				
	Tier 2 Prerequisite	*Designated Parking - 12% of Parking Capacity*	*A5.106.5.1.2*				
	Mandatory	Parking stall marking	5.106.5.2.1				
	Mandatory	Single Charging space requirements	5.106.5.3.1				
	Mandatory	Multiple Charging space requirements	5.106.5.3.2				
	Tier 2 Prerequisite	*Electric Vehicle (EV) Charging [N]*	*A5.106.5.3, A5.106.5.3.1, A5.106.5.3.3, A5.106.5.3.4*				
	Mandatory	EV charging space calculation [N] w/	5.106.5.3.3				
	Mandatory	[N] Identification	5.106.5.3.4				
	Mandatory	[N] Future charging spaces w/ notes 1-3	5.106.5.3.5				
	Mandatory	Light Pollution Reduction [N] w/ exceptions and note	5.106.8				
	Mandatory	Grading and Paving, Exception for Additions and Alterations not altering the	5.106.10				
	Tier 2 Prerequisite	*Cool roof (A5.106.11.2.2): SRI 82 when ≤ 2:12, SRI 27 when > 2:12*	*A5.106.11.2*				
	Electives	*Community Connectivity*	*A5.103.1*				
	Electives	*Brownfield or Greyfield site redevelopment or infill area*	*A5.103.2 A5.103.2.1*				
	Electives	*Reduce development footprint and optimize open space.*	*A5.104.1, A5.104.1.1, A5.104.1.2, A5.104.1.3*				
	Electives	*Disassemble and Reuse Existing Building Structure (70%)*	*A5.105.1.1*				
	Electives	*Disassemble and Reuse Existing Non-Structure elements (50%)*	*A5.105.1.2*				
Select three electives from A5.1	*Electives*	*Salvage*	*A5.105.1.3*				
	Electives	*Storm Water Design*	*A5.106.2, A5.106.2.1, A5.106.2.2*				
	Electives	*Low Impact Development (LID)*	*A5.106.3, A5.106.3.1, A5.106.3.2*				
	Electives	*Changing rooms*	*A5.106.4.3*				
	Electives	*Parking Capacity*	*A5.106.6, A5.106.6.1*				
	Electives	*Exterior Wall Shading*	*A5.106.7, A5.106.7.1, A5.106.7.2*				
	Electives	*Heat island Effect*	*A5.106.11*				

DIVISION 5.2 Energy Efficiency	Mandatory	Meet the minimum Energy Efficiency Standard	5.201.1				
	Tier 2 Prerequisite	*Energy Performance Outdoor lighting power 90% of Part 6*	*A5.203.1.1.1*				
	Tier 2 Prerequisite	*If applicable, Service for water heating in restaurants 8,000 sf or greater*	*A5.203.1.1.2*				
	Tier 2 Prerequisite	*Energy Budget 90% or 85% of Part 6 calculated value of allowance*	*A5.203.1.2.2*				
	Elective	*On-site renewable energy w/ documentation*	*A5.211.1 A5.211.1.1*				
	Elective	*Green power*	*A5.211.3*				
	Elective	*Elevators w/ car lights and fan*	*A5.212.1.1 A5.212.1.1.1*				
	Elective	*Escalators*	*A5.212.1.2 A5.212.1.4*				
	Elective	*Controls that reduce energy*	*A5.212.1.4*				
	Elective	*Steel framing*	*A5.213.1*				
DIVISION 5.3 Water Efficiency And Conservation	Mandatory	Separate Meters (new Buildings or additions > 50,000 SF that consume more than 100 gal/day)	5.303.1.1				
	Mandatory	Separate Meters (for tenants in new buildings or additions that consume more than 1,000 gal/day)	5.303.1.2				
	Tier 2 Prerequisite	*Water Reduction Tier 2. 20% or 25% savings over the "water use baseline" Table A5.303.2.2*	*A5.303.2.3.2 or A5.303.2.3.3*				
	Mandatory	Water closets shall not exceed 1.28 gallons per flush	5.303.3.1				
	Mandatory	Wall-mounted urinals shall not exceed 0.125 gpf	5.303.3.2.1				
	Mandatory	Floor-mounted urinals shall not exceed 0.5 gpf	5.303.3.2.2				
	Mandatory	Single showerhead shall have maximum flow rate of 1.8 gpm (gallons per minute) at 80 psi	5.303.3.3.1				
	Mandatory	Multiple showerheads serving one shower shall have a combined flow rate of 1.8 gpm at 80 psi	5.303.3.3.2				
	Mandatory	Nonresidential lavatory faucets	5.303.3.4.1				
	Mandatory	Kitchen faucets	5.303.3.4.2				
	Mandatory	Wash basins	5.303.3.4.3				
	Mandatory	Metering faucets	5.303.3.4.4				
	Mandatory	Metering faucets for wash fountains	5.303.3.4.5				
	Mandatory	Food waste disposers	5.303.4.1				
	Mandatory	Areas of additions and alterations	5.303.5				
	Mandatory	Standards for plumbing fixtures and	5.303.6				
	Mandatory	Outdoor water use in landscape areas equal to or greater than 500 sf	5.304.2				

	Mandatory	Outdoor water use in rehabilitated landscape projects with areas equal to or greater than 2,500 sf	5.304.3				
	Mandatory	Outdoor water use in landscape areas of 2,500 sf or less	5.304.4				
	Mandatory	Graywater or rainwater use in landscaped areas	5.304.5				
	Elective	*Nonpotable water systems for indoor use*	*A5.303.2.3.4*				
	Elective	*Appliances and fixtures for commercial application*	*A5.303.3*				
	Elective	*Nonwater supplied urinals*	*A5.303.4.1*				
	Elective	*Dual plumbing*	*A5.303.5*				
	Elective	*Outdoor potable water use*	*A5.304.2.1*				
Select three electives from A5.3	*Elective*	*Restoration of areas disturbed by construction*	*A5.304.6*				
	Elective	*Previously developed sites w/ exception*	*A5.304.7*				
	Elective	*Graywater irrigation system*	*A5.304.8*				
	Elective	*Nonpotable water systems*	*A5.305.1*				
	Elective	*Irrigation systems*	*A5.305.2*				
DIVISION 5.4 Conservation and Resource Efficiency	*Tier 2 Prerequisite*	*Recycled content for15% of total material cost*	*A5.405.4 A5.405.4.1 Through A5.405.4.5*				
	Mandator	Weather Protection	5.407.1				
	Mandator	Moisture Control: sprinklers	5.407.2.1				
	Mandatory	Moisture Control: Exterior door protection	5.407.2.2.1				
	Mandatory	Moisture Control: Flashing	5.407.2.2.2				
	Mandatory	Construction waste management-comply with either: sections 5.408.1.1, 5.408.1.2, 5.408.1.3 or more stringent local	5.408.1.1, 5.408.1.2, 5.408.1.3				
	Mandatory	Construction waste management: Documentation	5.408.1.4				
	Mandatory	Universal Waste [A]	5.408.2				
	Mandatory	Excavated soil and land clearing debris (100% reuse or recycle)	5.408.3				
	Tier 2 Prerequisite	*Enhanced construction waste reduction 80%– Tier 2 w/ verification w/ verification*	*A5.408.3.1.1 A5.408.3.1.2*				
	Mandatory	Recycling by Occupants w/ exception	5.410.1				
	Mandatory	Recycling by Occupants: Additions w/ exception	5.410.1.1				
	Mandatory	Recycling by Occupants: Sample ordinance	5.410.1.2				
	Mandatory	Commissioning new buildings (≥ 10,000 SF) [N]	5.410.2				

Select three electives from A5.4	Mandatory	Owner's or Owner representative's Project Requirements (OPR) [N]	5.410.2.1				
	Mandatory	Basis of Design (BOD) [N]	5.410.2.2				
	Mandatory	Commissioning Plan [N]	5.410.2.3				
	Mandatory	Functional Performance Testing [N]	5.410.2.4				
	Mandatory	Documentation and Training [N]	5.410.2.5				
	Mandatory	Systems Manual [N]	5.410.2.5.1				
	Mandatory	Systems Operation Training) [N]	5.410.2.5.2				
	Mandatory	Commissioning Report [N]	5.410.2.6				
	Mandatory	Testing and adjusting for new buildings < 10,000 SF or new systems that serve additions or alterations. [A]	5.410.4				
	Mandatory	System Testing Plan for HVAC, Lighting, water heating, renewable energy, landscape irrigation and water reuse.	5.410.4.2				
	Mandatory	Procedures for testing and adjusting	5.410.4.3				
	Mandatory	Procedures for HVAC balancing	5.410.4.3.1				
	Mandatory	Reporting for testing and adjusting	5.410.4.4				
	Mandatory	Operation and Maintenance (O&M)	5.410.4.5				
	Mandatory	Inspection and reports	5.410.4.5.1				
	Elective	*Wood framing or OVE (with note)*	*A5.404.1, A5.404.1.1, A5.404.1.2*				
	Elective	*Regional materials*	*A5.405.1*				
	Elective	*Bio-based materials*	*A5.405.2*				
	Elective	*Rapidly renewable materials*	*A5.405.2.2*				
	Elective	*Reused materials (with note)*	*A5.405.3*				
	Elective	*Cement and concrete: cement*	*A5.405.5.1*				
	Elective	*Cement and concrete: concrete with SCM & Mix design equation*	*A5.405.5.2, A5.405.5.2.1, A5.405.5.2.1.1*				
	Elective	*Cement and concrete: additional means of compliance*	*A5.405.5.3, A5.405.5.3.1, A5.405.5.3.1.1, A5.405.5.3.1.2, A5.405.5.3.2, A5.405.5.3.2.1, A5.405.5.3.2.2, A5.405.5.3.2.3, A5.405.5.3.2.4*				
	Elective	*Choice of materials*	*A5.406.1, A5.406.1.1, A5.406.1.2, A5.406.1.3*				
	Elective	*Life cycle assessment: general*	*A5.409.1*				
	Elective	*Whole building life cycle assessment*	*A5.409.2, A5.409.2.1, A5.409.2.2*				
	Elective	*Materials and system assemblies*	*A5.409.3*				
	Elective	*Substitution for prescriptive standards*	*A5.409.4*				

	Elective	*Verification of compliance*	*A5.409.5*				
DIVISION 5.5 **Environmental Quality**	Mandatory	Fireplaces	5.503.1				
	Mandatory	Woodstoves	5.503.1.1				
	Mandatory	Temporary ventilation	5.504.1				
	Mandatory	Covering of ducts openings and protection of mechanical equipment	5.504.3				
	Mandatory	Adhesives, sealants and caulks	5.504.4.1				
	Mandatory	Paints and coatings	5.504.4.3				
	Mandatory	Aerosol paints and coatings	5.504.4.3.1				
	Mandatory	Aerosol paints and coatings: Verification	5.504.4.3.2				
	Mandatory	Carpet systems	5.504.4.4				
	Mandatory	Carpet cushion	5.504.4.4.1				
	Mandatory	Carpet adhesives per table 5.504.4.1	5.504.4.4.2				
	Mandatory	Composite wood products	5.504.4.5				
	Mandatory	Composite wood products: Documentation	5.504.4.5.3				
	Mandatory	Resilient flooring systems	5.504.4.6				
	Mandatory	Resilient flooring: Verification of compliance	5.504.4.6.1				
	Tier 2 Prerequisite	*Resilient flooring systems, Tier 2 w/ verification*	*A5.504.4.7.1 A5.504.4.7.2*				
	Tier 2 Prerequisite	*Thermal insulation, Tier 2 w/ verification of compliance*	*A5.504.4.8.1 A5.504.4.8.2*				
	Mandatory	Filters w/ exceptions	5.504.5.3				
	Mandatory	Filters: Labeling	5.504.5.3.1				
	Mandatory	Environmental tobacco smoke (ETS) control	5.504.7				
	Mandatory	Indoor moisture control	5.505.1				
	Mandatory	Outside air delivery	5.506.1				
	Mandatory	Carbon dioxide (CO2) monitoring	5.506.2				
	Mandatory	Acoustical control w/ exception	5.507.4				
	Mandatory	Exterior noise transmission, prescriptive method	5.507.4.1				
	Mandatory	Noise exposure where noise contours are not readily available	5.507.4.1.1				
	Mandatory	Performance method	5.507.4.2				
	Mandatory	Site features	5.507.4.2.1				
	Mandatory	Documentation of compliance	5.507.4.2.2				
	Mandatory	Interior sound transmission w/ note	5.507.4.3				
	Mandatory	Ozone depletion and greenhouse gas reductions	5.508.1				
	Mandatory	Chlorofluorocarbons (CFCs)	5.508.1.1				
	Mandatory	Halons	5.508.1.2				

Select three electives from A5.5	Mandatory	Supermarket refrigerant leak reduction for retail food stores 8,000 square feet or more sections 5.508.2 through 5.508.2.6.3	5.508.2 through 5.508.2.6.3				
	Elective	*Indoor air quality (IAQ) during construction*	*A5.504.1* *A5.504.1.1* *A5.504.1.2*				
	Elective	*IAQ postconstruction*	*A5.504.2*				
	Elective	*IAQ testing*	*A5.504.2.1* *A5.504.2.1.1* *A5.504.2.1.2* *A5.504.2.1.3*				
	Elective	*No added formaldehyde Tier 1 w/ notes*	*A5.504.4.5.1*				
	Elective	*Acoustical ceilings and wall panels w/ verification of compliance*	*A5.504.4.9* *A5.504.4.9.1*				
	Elective	*Hazardous particulates and chemical*	*A5.504.5*				
	Elective	*Entryway systems*	*A5.504.5.1*				
	Elective	*Isolation of pollutant sources*	*A5.504.5.2*				
	Elective	*Filters, Tier 2*	*A5.504.5.3.1.1*				
	Elective	*Lighting and thermal comfort controls*	*A5.507.1* *A5.507.1.1 through A5.507.1.2*				
	Elective	*Daylight w/ exception*	*A5.507.2*				
	Elective	*Views w/ exception*	*A5.507.3*				
	Elective	*Interior office spaces*	*A5.507.3.1*				
	Elective	*Multi-occupant spaces*	*A5.507.3.2*				
	Elective	*Hydrochlorofluorocarbons (HCFCs)*	*A5.508.1.3*				
	Elective	*Hydrofluorocarbons (HFCs)*	*A5.508.1.4*				
Additional Measures	*Added measures Should be achieved across at least three*	*Select 3 additional measure*	Additional measures: 1. 2. 3.				
Total number of Measures required for Tier 2			25				
Total number of Measures selected							

Documentation Author's /Responsible Designer's Declaration Statement
Check the appropriate box(s) for the list below

- □ **Mandatory:** I attest that the mandatory provisions checklist is accurate and complete.
- □ **Tier 2 compliant:** I attest that the total number of voluntary measures selected meet or exceed the total number required to achieve Tier 2 compliance.
- □ **Partial Tier 2 compliant:** I attest that the total number of voluntary measures selected do not meet the total number

required to achieve Tier 2 compliance however partial Tier 2 compliance has been achieved.	
Signature:	
Company:	Date:
Address:	License:
City/State/Zip:	Phone: