

*Southern California Chapter
ASHRAE
presents*

CAL Green®

2010 Update and
Guide to Commissioning



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Introduction

California Building Standards Commission

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Today's Objectives

- **CALGreen Intro**
- **Code Cycle**
- **2010 CALGreen Supplement**
 - Overview of Mandatory Nonresidential Code Provisions
 - Commissioning
- **Graywater & Rainwater Update**
- **Q&A**

California Green Building Standards Code

■ CALGreen

- Initial Voluntary Standards
 - Effective August 1, 2009
- City and County Adoption
- 2010 Mandatory Standards (triennial publication)
 - Part 11, Title 24
 - Effective January 1, 2011

California Green Building Standards Code

Code Cycles

■ 2010 Supplement

- New mandatory nonresidential provisions include alterations and additions
- Effective July 1, 2012

■ Current Code Adoption Cycle (2012)

- 2013 triennial code effective January 1, 2014

California Green Building Standards Code

- **Chapter 5 Nonresidential Mandatory Measures**
 - Planning and Design – Division 5.1
 - Energy Efficiency – Division 5.2
 - Water Efficiency and Conservation – Division 5.3
 - Material Conservation and Resource Efficiency – Division 5.4
 - Environmental Quality – Division 5.5
 - Additions and Alterations – Division 5.7
 - New- Effective July 1, 2012

PLANNING AND DESIGN – Chapter 5-Division 5.1

Site Development

January 1, 2011

- Stormwater soil loss prevention plan
- Bicycle parking
- Designated parking

July 1, 2012

- Stormwater pollution prevention BMP *
- Delete UC reference *
- Clarify stall marking *

* Also applies to additions and alterations

PLANNING AND DESIGN – Chapter 5- Division 5.1

Site Development

January 1, 2011

- Light pollution reduction
 - Voluntary on April 20, 2011
- Grading and paving

July 1, 2012

- IESNA 2011 BUG Ratings mandatory as of July 1, 2012
- Coordinate BMP with HCD *

* Also applies to additions and alterations

ENERGY EFFICIENCY - Chapter 5- Division 5.2

Mandatory Measures are Regulated by the California Energy Commission

- Mandatory provisions are found in Part 6 of Title 24

WATER EFFICIENCY AND CONSERVATION Chapter 5-

Division 5.3

Indoor Water Use

January 1, 2011

- Separate water submeters for high water use
- 20% reduction in indoor water use
 - Prescriptive and performance standards

July 1, 2012

- Separate water submeters or metering devices for subsystems*
- Clarify prescriptive and performance methods, showerheads and tables*

* Also applies to additions and alterations

WATER EFFICIENCY AND CONSERVATION Chapter 5-

Division 5.3

Outdoor Water Use



January 1, 2011

- Water budget
- Separate submeter for outdoor potable water use
- Weather or soil moisture-based irrigation controllers

July 1, 2012

- No change *
- Minor clarifications *
- Minor clarifications *

* Also applies to additions and alterations

MATERIAL CONSERVATION and RESOURCE EFFICIENCY - Chapter 5- Division 5.4

Water Resistance & Moisture Management

January 1, 2011

- Exterior weather protection by Title 24 or local ordinance
- Design for moisture control
 - Sprinklers
 - Entries and openings

July 1, 2012

- No change *
- No change *

* Also applies to additions and alterations

MATERIAL CONSERVATION AND RESOURCE EFFICIENCY - Chapter 5- Division 5.4

Construction Waste Reduction, Disposal & Recycling

January 1, 2011

- Construction waste reduction of 50%
- Waste management plan required, or meet local ordinance

July 1, 2012

- No change *
- Same; add options for *
 - Waste management company
 - Waste stream reduction

* Also applies to additions and alterations

MATERIAL CONSERVATION AND RESOURCE EFFICIENCY - Chapter 5- Division 5.4

Construction Waste Reduction, Disposal & Recycling

January 1, 2011

- Exception for isolated jobsites
- Recycle or reuse 100% of land clearing debris

July 1, 2012

- No change *
- Same; add exception for contaminated debris *

* Also applies to additions and alterations

MATERIAL CONSERVATION AND RESOURCE EFFICIENCY - Chapter 5- Division 5.4 Building Maintenance and Operation

January 1, 2011

- Recycling by occupants



July 1, 2012

- No change *

* Also applies to additions and alterations

MATERIAL CONSERVATION AND RESOURCE EFFICIENCY - Chapter 5- Division 5.4

Building Maintenance and Operation

January 1, 2011

- Commissioning: For new buildings 10,000 square feet and over:
 - Owner's or Owners Representative's Project Requirements (OPR)
 - Basis of Design (BOD)
 - Commissioning measures shown in the construction documents
 - Commissioning plan
 - Functional performance testing
 - Documentation and training
 - Commissioning report

July 1, 2012

- Minor clarifications
 - Exceptions:
 - Dry storage warehouses of any size
 - Areas under 10,000 square feet used for offices or other conditioned accessory spaces within dry storage warehouses
 - Tenant improvements under 10,000 square feet as described in Section 303.1.1.
 - All building operating systems and components covered by Title 24, Part 6, as well as process equipment and controls, and renewable energy systems shall be included in the scope of the Commissioning Requirements.

MATERIAL CONSERVATION AND RESOURCE EFFICIENCY - Chapter 5- Division 5.4

Building Maintenance and Operation

January 1, 2011

- Owner's Project Requirements (OPR). The expectations and requirements of the building shall be documented before the design phase of the project begins. At a minimum, this documentation shall include the following:
 - Environmental and Sustainability Goals.
 - Energy Efficiency Goals.
 - Indoor Environmental Quality Requirements.
 - Project program, including facility functions and hours of operation, and need for after hours operation
 - Equipment and Systems Expectations.
 - Building occupant and operation and maintenance (O&M) Personnel Expectations.

July 1, 2012

- No Changes

MATERIAL CONSERVATION AND RESOURCE EFFICIENCY - Chapter 5- Division 5.4 Building Maintenance and Operation

January 1, 2011

- Basis of Design (BOD):
 - Heating, ventilation, air conditioning (HVAC) systems and controls
 - Indoor lighting system and controls
 - Water heating system
 - Renewable energy systems
 - Landscape irrigation systems
 - Water reuse systems

July 1, 2012

- Minor clarifications

MATERIAL CONSERVATION AND RESOURCE EFFICIENCY -

Chapter 5- Division 5.4

Building Maintenance and Operation

January 1, 2011

- Commissioning plan. Prior to permit issuance a commissioning plan shall be completed to document how the project will be commissioned ~~and shall be started during the design phase of the building project~~ . The Commissioning Plan shall include the following:
 - **General project information**
 - **Commissioning goals**
 - **Systems to be commissioned. Plans to test systems and components shall include:**
 - a. An explanation of the original design intent
 - b. Equipment and systems to be tested, including the extent of tests
 - c. Functions to be tested
 - d. Conditions under which the test shall be performed
 - e. Measurable criteria for acceptable performance
 - **Commissioning team information**
 - **Commissioning process activities, schedules and responsibilities.** Plans for the completion of commissioning requirements listed in A5.410.4.4 through A5.410.4.6 shall be included

July 1, 2012

- Minor editorial changes

MATERIAL CONSERVATION AND RESOURCE EFFICIENCY -

Chapter 5- Division 5.4

Building Maintenance and Operation

January 1, 2011

- **Functional Performance Testing.** 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.
- **Documentation and training.** A Systems Manual and Systems Operations Training are required, including Occupational Safety and Health Act (OSHA) requirements in California Code of Regulations (CCR), Title 8, Section 514, and other related regulations.

July 1, 2012

- **No changes**

MATERIAL CONSERVATION AND RESOURCE EFFICIENCY -

Chapter 5- Division 5.4

Building Maintenance and Operation

January 1, 2011

- **Systems manual.** Documentation of the operational 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 shall include the following:
 - **Site information**, including facility description, history and current requirements
 - **Site contact information**
 - **Basic operations and maintenance**, including general site operating procedures, basic troubleshooting, recommended maintenance requirements, site events log
 - **Major systems**
 - **Site equipment inventory and maintenance notes**
 - **A copy of all ~~special inspection~~ verifications required by the enforcing agency or this code**
 - **Other resources and documentation if applicable**

July 1, 2012

- Minor editorial changes

MATERIAL CONSERVATION AND RESOURCE EFFICIENCY -

Chapter 5- Division 5.4

Building Maintenance and Operation

January 1, 2011

- **Systems operations training.** The 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:
 - System/equipment overview (what it is, what it does and with what other systems and/or equipment it interfaces)
 - Review and demonstration of servicing/preventive maintenance
 - Review of the information in the Systems Manual
 - Review of the record drawings on the system/equipment
- **Commissioning report.** A complete report of commissioning process activities undertaken through the design, and construction and reporting recommendations for post-construction phases of the building project shall be completed and provided to the owner or representative.
- Note: Guidance on implementation and enforcement of commissioning requirements, including sample compliance forms and templates, may be found in Appendix A6, Division A6.1, of this code.

July 1, 2012

- Minor changes

MATERIAL CONSERVATION AND RESOURCE EFFICIENCY -

Chapter 5- Division 5.4

Building Maintenance and Operation

January 1, 2011

- Testing and adjusting. Testing and adjusting of systems shall be required for buildings less than 10,000 square feet.
- Systems. Develop a written plan of procedures for testing and adjusting systems. Systems to be included for testing and adjusting shall include at a minimum, as applicable to the project:
 - HVAC systems and controls
 - Indoor and outdoor lighting and controls
 - Water heating systems
 - Renewable energy systems
 - Landscape irrigation systems
 - Water reuse systems

July 1, 2012

- Minor editorial changes

MATERIAL CONSERVATION AND RESOURCE EFFICIENCY -

Chapter 5- Division 5.4

Building Maintenance and Operation

January 1, 2011

- Procedures
 - Perform testing and adjusting procedures in accordance with manufacturer's specifications and industry best practices and applicable national standards on each system as ~~determined by the building official.~~

HVAC balancing:

- In addition to testing and adjusting, before a new space-conditioning system serving a building or space is operated for normal use, balance the system ~~shall be balanced~~ in accordance with the procedures defined by the Testing Adjusting and Balancing Bureau National Standards; the National Environmental Balancing Bureau Procedural Standards; or Associated Air Balance Council National Standards or as approved by the ~~building official enforcing agency.~~

July 1, 2012

- Minor editorial changes

MATERIAL CONSERVATION AND RESOURCE EFFICIENCY -

Chapter 5- Division 5.4

Building Maintenance and Operation

January 1, 2011

- Reporting. After completion of testing, adjusting and balancing, provide a final report of testing signed by the individual responsible for performing these services.
- Operation and maintenance manual. Provide the building owner or representative with detailed operating and maintenance instructions and copies of guaranties/warranties for each system. O&M instructions shall be consistent with OSHA requirements in CCR, Title 8, Section 514, and other related regulations.
- Inspections and reports. Include a copy of all special inspection verifications and reports required by the enforcing agency.

July 1, 2012

- No changes

ENVIRONMENTAL QUALITY –

Chapter 5- Division 5.5

Pollutant Control

January 1, 2011

- Fireplaces
- Temp. const. ventilation (Voluntary)
- Covering of duct openings and protection of equipment during construction

July 1, 2012

- No change *
- If HVAC is used for temp. const. ventilation (replace filters)*
- Minor clarifications *

* Also applies to additions and alterations

ENVIRONMENTAL QUALITY –

Chapter 5- Division 5.5

Pollutant Control

January 1, 2011

- Indoor air quality
 - Finish materials
 - Filters

 - Environmental tobacco smoke

July 1, 2012

- Minor clarifications *
 - Referenced standards
 - Exception for small, H.E. ductless units
 - Clarification of authority to regulate

* Also applies to additions and alterations

ENVIRONMENTAL QUALITY –

Chapter 5- Division 5.5

January 1, 2011

- Indoor moisture control (other codes)
- Indoor air quality (Energy Code)
 - Ventilation
 - CO₂ monitoring

July 1, 2012

- No change *
- Editorial changes *

*** Also applies to additions and alterations**

ENVIRONMENTAL QUALITY –

Chapter 5- Division 5.5

January 1, 2011

- **Environmental Comfort**
 - Exterior noise transmission
 - Interior sound
- **Outdoor air quality**
 - Ozone depleting chemicals

July 1, 2012

- **Significant changes ***
 - Align with HCD in CBC and general plans; added performance & prescriptive methods and some exceptions
 - Minor change
- **No change ***

* Also applies to additions and alterations

2010 California Green Building Standards Code

NONRESIDENTIAL VOLUNTARY MEASURES

- Appendix A5
 - The measures contained in the appendix are not mandatory unless adopted by a city, county, or city and county. Appendix provisions may also be used voluntarily by designers, builders, and property owners.

 - *CALGreen* Tier 1 and Tier 2 are intended for adoption by cities, counties, and cities and counties to help California meet its goals for greenhouse gas emission reduction.

Category	Environmental Performance Goal	Tier 1	Tier 2
All	Minimum Mandatory	Meet all of the provisions of Chapter 5	Meet all of the provisions of Chapter 5
Planning and Design	Designated Parking for Fuel Efficient Vehicles	10 percent of total spaces	12 percent of total spaces
	Cool Roof to Reduce Heat Island Effect	Roof Slope < 2:12 SRI 64 Roof Slope > 2:12: < 5 lb/s.f. SRI 16 ≥ 5 lb/s.f. SRI 10	Roof Slope < 2:12 SRI 78 Roof Slope > 2:12: < 5 lb/s.f. SRI 23 ≥ 5 lb/s.f. SRI 30
		1 additional Elective from Division A5.1	3 additional Electives from Division A5.1
Energy Efficiency	Energy Performance	Exceed 2010 CA Energy Code by 15 percent	Exceed 2010 CA Energy Code by 30 percent
Water Efficiency and Conservation	Indoor Water Use	30 percent Savings	35 percent Savings
	Outdoor Water Use	Not exceed 60 percent of ETo times the landscape area	Not exceed 55 percent of ETo times the landscape area
		1 additional Elective from Division A5.3	3 additional Electives from Division A5.3
Material Conservation and Resource Efficiency ²	Construction Waste Reduction	At least 65 percent reduction	At least 80 percent reduction
	Recycled Content	Utilize recycled content materials for 10 percent of total material cost	Utilize recycled content materials for 15 percent of total material cost
		1 additional Elective from Division A5.4	3 additional Electives from Division A5.4
Environmental Quality	Low-VOC Resilient Flooring	80 percent of flooring meets VOC limits	90 percent of flooring meets VOC limits
	Low-VOC Thermal Insulation	Comply with VOC limits	Install no-added formaldehyde insulation & comply 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
Approximate Total Measures		14	24

California Building Standards Commission

■ Proposed Regulations

- (Anticipated Effective Date January 2014)

- Graywater

- Rainwater Catchment

California Building Standards Commission

■ Codes Online

- Newly reformatted CBSC website for easier access to code information
 - Rulemaking Process
 - Code Cycles
 - Current Codes
 - Guidebooks and other resources
 - Information Bulletins
 - Meeting Notices

- www.bsc.ca.gov



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FEATURED LINKS

- CALGreen
- Bulletins
- Notices
- SB1473
- Feedback
- Related Sites
- Archives



Welcome! The California Building Standards Commission (CBSC) is responsible for the administration of California's building codes (California Code of Regulation, Title 24), which includes the adoption, approval, publication, and implementation of codes and standards.

California's building codes are published on a triennial basis. Supplements and errata are issued throughout the cycle. Review the [current code cycle](#) here.

The 2010 codes are available online both on this website and on the submitting agencies websites:

Residential construction: California Department of Housing and Community Development, www.hcd.ca.gov

Schools Construction: California Department of General Services, Division of the State Architect, www.dgs.ca.gov/dsa

Access Compliance: California Department of General Services, Division of the State Architect, www.dgs.ca.gov/dsa/Programs/progAccess

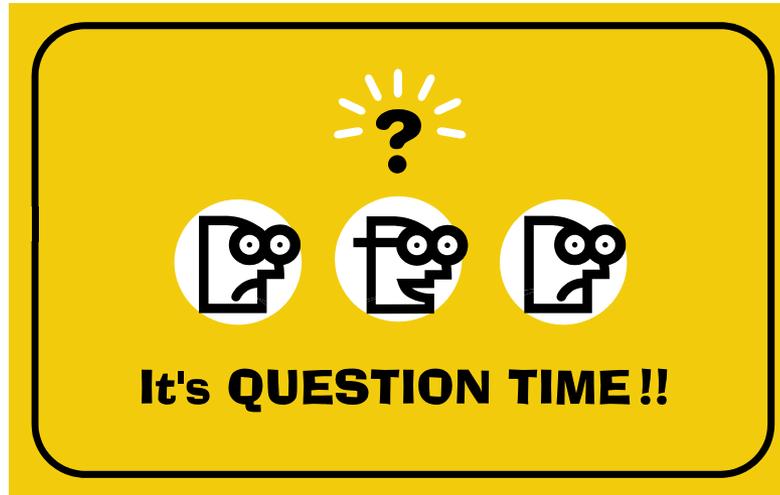
Hospitals and clinic construction: California Office of Statewide Health Planning and Development, <http://www.oshpd.ca.gov/>

Fire and Panic Safety: Office of the State Fire Marshal, <http://www.osfm.fire.ca.gov/>

California Building Standards Commission Meetings are now webcast - <http://www.dca.ca.gov/stream/audiocast.asx>. Link is active five minutes prior to meeting start times.

California's building codes are published by the International Code Council (ICC), with the exception of the Plumbing and Mechanical codes, and may be purchased directly from the council. Visit the online store at www.iccsafe.org, or call 800-786-4452 for order information.

Thank you...



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