



STATE OF CALIFORNIA



2010 California Green Building Standards Code

- Building Commissioning Measures

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California Green Building Standards Code

California Code of Regulations (CCR), Part 11

- 2008 Code took effect August 1, 2009
 - Includes voluntary measures
- 2010 Code takes effect January 1, 2011
 - Includes mandatory as well as voluntary measures
 - Includes 2 tiers of energy efficiency measures
 - 3rd tier for grid neutral schools
 - Currently in 2nd 45-day public comment period
 - until November 16th
 - http://www.bsc.ca.gov/prpsd_chngs/pc_09_comment.htm

Building Commissioning Mandatory

- **504.4 5.410.2 Commissioning.**
 - Mandatory for new non-residential buildings $\geq 10,000$ s.f.
 - Optional for schools & hospitals
 - Cx included in the design and construction processes of the building project to verify that the building systems and components meet the owner's project requirements.
 - Commissioning shall be performed in accordance with this section by personnel trained and certified in commissioning by a nationally recognized organization

Cx Minimum Requirements

1. Owner's Project Requirements
2. Basis of Design
3. Commissioning measures shown in the construction documents
4. Commissioning Plan
5. Functional Performance Testing
6. Post Construction Documentation & Training
7. Commissioning Report

Building Systems Included

1. Heating, Ventilation, Air Conditioning (HVAC) Systems and Controls
2. Indoor Lighting System and Controls
3. Water Heating System
4. Renewable Energy Systems
5. Landscape Irrigation Systems
6. Water Reuse Systems
7. Process equipment and controls

Owner's Project Requirements (OPR)

504.4.1 5.410.2.1 The expectations and requirements of the building shall be documented before the design phase of the project begins

1. Environmental and Sustainability Goals
2. Energy Efficiency Goals
3. Indoor Environmental Quality Requirements
4. Equipment and Systems Expectations
5. Building Occupant and O&M Personnel Expectations

Basis of Design (BOD)

504.4.2 5.410.2.2 A written explanation of how the design of the building systems meets the Owner's Project Requirements shall be completed at the design phase of the building project, and updated as necessary during the design and construction phases

Commissioning Plan

5.410.2.3 A commissioning plan shall be completed to document the approach to 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 at a minimum:

1. General Project Information
2. Commissioning Goals

Commissioning Plan (cont.)

3. Systems to be commissioned - Plans to test systems and components shall include at a minimum:
 - a. A detailed 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 Plan (cont.)

4. Commissioning Team Information
5. Commissioning Process Activities, Schedules & Responsibilities
 - plans for the completion of Commissioning Requirements listed in 5.410.2.4 through 5.410.2.6 shall be included

Functional Performance Testing

5.410.2.4 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.

Post Construction Documentation and Training

5.410.2.5 Post construction documentation and training. A Systems Manual and Systems Operations Training are required.

Post Const. Doc. and Training

5.410.2.5.1 Systems manual. Documentation of the operational aspects of the building shall be completed within the Systems Manual and delivered to the building owner and facilities operator, shall include:

1. Site Information, including facility description, history and current requirements
2. Site Contact Information
3. Basic Operations & Maintenance, including general site operating procedures, basic troubleshooting, recommended maintenance requirements, site events log
4. Major Systems
5. Site Equipment Inventory and Maintenance Notes
6. A copy of all special inspection verifications required by the enforcing agency or this code
7. Other Resources & Documentation

Post Const. Doc. and Training

5.410.2.5.2 Systems operations training.

The training of the appropriate maintenance staff for each equipment type and/or system shall include, as a minimum, the following:

1. System/Equipment overview (what it is, what it does and what other systems and/or equipment interfaces with)
2. Review of the information in the Systems Manual
3. Review of the record drawings on the system/equipment

Commissioning Report

5.410.2.6 Commissioning report.

A complete report of commissioning process activities undertaken through the design, construction and post-construction phases of the building project shall be completed and provided to the owner.

Buildings <10,000 sq. ft.

5.410.3 Testing, adjusting and balancing.

Testing, adjusting and balancing of systems shall be required for buildings less than 10,000 square feet.

1. Written plan req'd for same systems as Cx
2. TAB procedures in accordance w/ industry best practices & applic. national standards
3. Final report req'd signed by TAB resp. person
4. O&M manual req'd, incl. any special inspection reports

What Can the CCC Do to Help?

Prepare unified response to the California Building Standards Commission including:

1. Strong support of commissioning to be included among the mandatory provisions of the 2010 Green Building Standards Code
2. Review proposed code language closely and put together specific recommendations on clarifications, links, or other recommendations to improve it
3. Recommendations to the Division of the State Architect, as well as OSHPD to include Commissioning among their mandatory provisions, instead of voluntary

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