CALGreen & Commissioning: Challenges & Opportunities

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21st National Conference on Building Commissioning
The California Green Building Standards Code (CALGreen) took effect in January 2011, establishing the first mandatory statewide green building code.

The CALGreen Code addresses planning, energy efficiency, water efficiency and conservation, environmental quality, building operations – and commissioning.

The Code mandates commissioning for most new non-residential projects over 10,000 sq.ft.

We’ll present an overview of the Code's five Sections and major divisions, focusing on the commissioning requirements, and discuss the upcoming Code changes for 1/1/2014.
Learning Objectives

At the end of this session, participants will be able to:

1. Explain the purpose of the current California Green Building Standards (CALGreen) Code.
2. Compare the CALGreen (mandatory) and LEED (voluntary) requirements for five major areas addressed in the Code.
3. Describe the commissioning requirements of the current CALGreen Code.
4. Understand CALGreen’s mandatory, Tier 1 and Tier 2 requirements.
5. Recognize the impact of the scope and jurisdictional changes for commissioning moving to the 2013 Energy Code effective 1/1/2014.
California Green Building Standards Code

Effective 1/1/2011:

1. Reduce greenhouse gas emissions.
2. Promote environmentally responsible, cost-effective and healthier places to live & work.
3. Reduce energy and water consumption.
4. An important step towards more efficient and sustainable building designs.
All new non-residential and residential buildings are required to implement CALGreen Mandatory Measures.

Commercial alterations or additions over $500,000 and 2,000 sq.ft. must comply with CALGreen mandatory measures as of July 1, 2012.

After January 1, 2014, threshold drops to $200,000 and 1,000 sq.ft.
CALGREEN / LEED COMPARISON

CALGreen Chapter Divisions

- **Planning and Design**
  (LEED - Sustainable Sites)

- **Energy Efficiency**
  (LEED - Energy & Atmosphere)

- **Water Efficiency and Conservation**
  (LEED - Water Efficiency)

- **Material Conservation and Resource Efficiency**
  (LEED - Material Resources)

- **Environmental Quality**
  (LEED - Indoor Environmental Quality)
Planning and Design Division 5.1

CALGreen mandatory measures (voluntary for LEED projects):

- Storm water pollution prevention plan
- Bicycle parking
- Designated parking
- Light pollution reduction
  plus
- Grading and Paving
NON-RESIDENTIAL MANDATORY MEASURES  
CALGREEN / LEED COMPARISON

**Energy Efficiency Division 5.2**

CALGreen mandatory measures (voluntary for LEED projects):

- Meet California Energy Code Title 24, Part 6-2008

No additional Mandatory Measures
NON-RESIDENTIAL MANDATORY MEASURES
CALGREEN / LEED COMPARISON

Water Efficiency and Conservation Division 5.3
CALGreen mandatory measures (voluntary for LEED projects):

- Efficient indoor plumbing fixtures
- Automatically adjusting irrigation controllers

Additional CALGreen Mandatory Measures:
- Indoor water sub-metering
- Outdoor water use budget
- Outdoor water sub-metering
NON-RESIDENTIAL MANDATORY MEASURES
CALGREEN / LEED COMPARISON

Material Conservation & Resource Efficiency Division 5.4
CALGreen mandatory measures (voluntary for LEED projects):

- Construction waste management plan
- Recycling

CALGreen additional mandatory measures:

- **Commissioning**
  (only Testing & Adjusting for projects < 10,000 sq.ft.)
- Weather protection and moisture control
- Excavated vegetation and soil reuse or recycling
Environmental Quality Division 5.5

Voluntary measures under LEED now mandatory under CALGreen:

- Pollutant control for finish materials
- Environmental tobacco smoke control
- Mechanical system protection during construction
- Air filtration media for outside and return air
- Ventilation requirements per CEC or local code
- CO₂ monitoring
- No CFCs or Halon in installed equipment
Environmental Quality Division 5.5 (continued)

Additional CALGreen mandatory measures:

- Acoustical control for building assemblies and components
- Exterior noise transmission
- Interior wall and partition noise transmission
- Fireplaces and woodstoves direct-vent or sealed combustion
- Indoor moisture control
NON-RESIDENTIAL MANDATORY MEASURES

Material Conservation & Resource Efficiency Division 5.4

- **Section 5.410.2: Commissioning**
  - Required for all new non-residential buildings over 10,000 sq.ft.
  - Required for all non-residential tenant improvements and additions over 10,000 sq.ft.
  - For new non-residential buildings under 10,000 sq.ft., only Testing and Adjusting required.
NON-RESIDENTIAL MANDATORY MEASURES

Material Conservation & Resource Efficiency Division 5.4

- **Section 5.410.2: Commissioning**

- **Commissioning is required for these systems:**
  - HVAC and controls
  - Domestic water heating
  - Indoor and outdoor lighting and controls
  - Renewable energy systems
  - Process equipment and controls
  - Landscape irrigation
  - Water reuse systems
NON-RESIDENTIAL MANDATORY MEASURES

Material Conservation & Resource Efficiency Division 5.4

Section 5.410.2: Commissioning

Commissioning – Design Phase

- Owner’s Project Requirements
- Basis of Design
- Commissioning Specifications
- Commissioning Plan
- Included when submitting for Permit
NON-RESIDENTIAL MANDATORY MEASURES

Material Conservation & Resource Efficiency Division 5.4

- Section 5.410.2: Commissioning

- Commissioning - Construction Phase
  - Commissioning Coordinator leads Cx Team
  - Functional Performance Testing
  - Deficiencies Log
  - Systems Manual
  - Systems Operation Training Verification
  - Commissioning Report
Material Conservation & Resource Efficiency Division 5.4

Section 5.410.2: Commissioning

Qualifications of Commissioning Coordinator

- Trained personnel
- Experience on projects of comparable size and complexity
- Independent, 3rd-party commissioning professional
- Facilities staff, contractor or design team member
Section 5.410.4: Testing and Adjusting

For projects less than 10,000 sq.ft.

- Testing & Adjusting Plan
- Applies to same systems as for commissioning
- TAB balancing for HVAC systems
- Report
- Operation & Maintenance Manual
NON-RESIDENTIAL MANDATORY COMMISSIONING
MOVING TO THE ENERGY CODE

Commissioning requirements moving to:

▶ Title 24, Part 6 - Energy Code
▶ Section 120.8 Building Commissioning

✓ CALGreen commissioning requirements incorporated into the Energy Code
✓ Effective January 1, 2014
✓ Mandatory for almost all state agencies
✓ K-12 and community college buildings
NON-RESIDENTIAL MANDATORY COMMISSIONING
MOVING TO THE ENERGY CODE

Commissioning requirements moving to:

- **Title 24, Part 6 – Energy Code**
- **Section 120.8 Building Commissioning**

- Additional Requirements:
  - Schematic and CD-phase reviews
  - Design review by independent design engineer
  - Commissioning requirements shown on plans
  - Commercial refrigeration, compressed air systems
CALGreen compliance forms and worksheets:


http://www.bsc.ca.gov/Home/CALGreen.aspx

CALGreen Non-Residential Checklists:
Appendix A5, Table A5.602

CALGreen Residential Checklists:
Appendix A4, Table A4.602
SUMMARY

- CALGreen applies to all new non-residential and residential buildings, and alterations or additions over $500,000 and 2,000 sq.ft.
- Mandatory measures include commissioning for new or alteration projects over 10,000 sq.ft.

- Major mandatory changes:
  - Water use reduction
  - Indoor pollutant control
  - Commissioning

- Major changes for commissioning coming in January 2014:
  - Moving to Title 24 Energy Code – mandatory for all state agencies
  - Required for K-12 and community college buildings
  - Design Review during Schematic and Construction Document phases
  - Additional systems required to be commissioned
THANK YOU

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