California Commissioning Collaborative

Comments on the Proposed California Green Building Standards Code, Part 10, Title 24

Submitted to:
California Building Standards Commission

Submitted by:
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Introduction

The California Commissioning Collaborative (CCC) respectfully submits the following comment regarding the proposed California Green Building Standards Code, Part 10, Title 24.

The CCC is a non-profit 501(c)3 organization committed to improving the performance of buildings and their systems. The CCC is made up of government, utility, real estate, and building services organizations and professionals who have come together to create a viable market for building commissioning in California.

The CCC was established in 2000 to advise the California Energy Commission (CEC) on the development of equipment acceptance testing provisions for Title 24. Since acceptance testing requirements were adopted into the Standard in 2005, the CCC has continued to work with CEC to revise the requirements and provide training and outreach to increase compliance with the code.

In addition, the CCC work plan focuses on promoting building commissioning through policies, standards, and research; measurement and verification research and tools; and education, training, and outreach. More information is available at: http://www.cacx.org/.

Commissioning is Key to Better Building Performance

The California Commissioning Collaborative congratulates the California Building Standards Commission for continuing California's pursuit of innovative approaches to energy efficiency and resource management through building codes and standards.

The proposed California Green Building Standards Code (GBSC) sets forth mandatory requirements for comprehensive commissioning of non-residential buildings, which we believe will have a long-term impact on the realization of energy savings as well as other non-energy benefits of commissioning.

The GBSC commissioning requirements will push the building industry toward greater uptake of commissioning, which is increasingly accepted as a cost-effective process for optimizing building performance, reducing energy use, and improving indoor air quality, occupant comfort, and productivity.

The CCC supports the implementation of the proposed standard and offers the following recommendations for your consideration:

1. Include design review in the GBSC Standard
2. Establish minimum standards for commissioning provider certification
3. Provide training and outreach to support compliance and enforcement

1. Include Design Review in the GBSC Standard

In 2006, the CCC published the California Commissioning Guide for New Buildings (available at: http://www.cacx.org/resources/commissioning-guides.html). This guideline, along with its companion document on retrocommissioning, fulfilled the requirement in Executive Order S-20-04 for the California Energy Commission (CEC) to develop commissioning and retrocommissioning guidelines for commercial buildings. The Guide for new buildings describes the commissioning process, deliverables, and team structure needed to ensure the greatest results from new building commissioning.

As described in the Guide, the design phase is one of the most critical phases of a building project. In design, the project evolves from concept to plan, as architects and engineers develop drawings, draft construction documents, and write specifications. During this phase, design review by the commissioning lead ensures that as the building becomes a reality, its systems and operations continue to reflect the owner's goals. A commissioning-focused design review will consider important decisions such as:

- Accessibility of equipment for operations and maintenance
- Energy impact of design decisions
- Details of the controls design relative to equipment being controlled
- Ability of controls interface to facilitate trending and identification of equipment faults during functional testing
- Identification and access of test ports, sensors, and in-situ measurement devices for use in functional testing and recommissioning

Identification and resolution of design issues prior to construction can result in cost-effective improvements to the operability and long-term performance of a building.

We acknowledge that design review is a challenging step in the process, and is often omitted from commissioning plans to meet project timelines and budgets. The CCC is currently planning research efforts to determine the feasibility of building code requirements for design-phase commissioning activities, including design review. Results of this study may provide insight into practical approaches for implementing mandatory design review requirements.

In the meantime, we encourage the Building Standards Commission to include a voluntary standard for design review, following existing guidance provided by ASHRAE Guideline 0-2005 (Section 6) and/or Energy Design Resources Cx Assistant. Cx Assistant is a web-based commissioning reference and provides access to sample commissioning specifications and other tools. The Design Review Tool included in Cx Assistant provides a customizable checklist and reference guide for 18 design review areas.

- Cx Assistant Website: http://www.energydesignresources.com/Resources/SoftwareTools/CommissioningAssistant.aspx
- Energy Design Resources Design Review Brief: http://www.energydesignresources.com/Design/BuildingCommissioning/tabid/90/articleType/ArticleView/articleId/107/Design-Briefs-Design-Review.aspx
- Cx Assistant Design Review Checklist Documentation (downloadable from CCC website): http://resources.cacx.org/library/HoldingDetail.aspx?id=396

2. Establish Minimum Standards for Commissioning Provider Certification

Proposed language regarding training and certification for commissioning agents (5.410.2) will establish the largest possible pool of commissioning agents to be considered qualified to provide the services and deliverables required by GBSC. Considering the scope and scale of the Standard, a large pool of providers is certainly needed.

While we understand the value of the broad certification requirement, we also anticipate unintended negative consequences. As written, the GBSC does not establish a minimum standard for the content or quality of certification, and therefore may provide an opening for opportunistic organizations to offer certifications that meet the vague qualification of "nationally recognized," but have little technical merit or real credibility in the market.

Without assurance of the quality of training or certification, poorly trained "certified" commissioning agents will be "qualified" to provide substandard service and deliverables that do not achieve the intended energy efficiency and other benefits associated with comprehensive commissioning.

Commissioning professionals require a unique combination of engineering, design fundamentals and building operations knowledge that is not easily acquired. Currently, a number of credible organizations provide commissioning certifications that cover key aspects of the "art" and the "science" of the commissioning process. These certifications are described on the CCC website at: http://www.cacx.org/resources/provider_cert.html. We are also aware of additional training and certification programs that have been proposed for funding by California and federal agencies. These programs have the potential to bring additional high-quality certifications to the market.

The CCC encourages the Building Standards Commission to specify that commissioning agents be trained and/or certified by one of the entities listed on the CCC website. Though the CCC does not endorse any one certification, we offer an objective analysis of existing certifications and will maintain and update the list as new certifications that meet minimum standards become available. We believe the CCC's position in the commissioning industry in California establishes the organization's credibility to set a minimum standard for commissioning certification which will in turn support the goals of the GBSC Standard.

3. Provide Training and Outreach to Support Compliance and Enforcement

The mandatory commissioning requirements in GBSC take a bold step in the right direction toward more efficient, healthy and productive buildings in California. We believe a number of key factors will create significant challenges for the near-term implementation of the Standard.

The penetration rate for new building commissioning is growing, but is still low. A 1998 study estimated that only 2 percent of all new buildings are commissioned annually[1]. Even considering the recent surge of state and federal mandates for commissioning, there is a huge gap in the knowledge and acceptance of the commissioning practice among building owners. This presents a significant barrier to compliance with GBSC commissioning requirements.

Capacity of trained and certified commissioning providers is not sufficient to meet demand for commissioning all non-residential buildings ≥10,000 sf. A recent report from Lawrence Berkeley National Laboratory indicates that a tenfold increase in the commissioning workforce would be required to commission the existing commercial floor space in the U.S. within 10 years[2]. This estimate, though made in the context of existing buildings and a national scale, makes a clear statement about the gap in supply and demand for commissioning services. There are initiatives in California and at the federal level to increase the quantity and capacity of commissioning providers, and the CCC plans to provide both technical and financial support toward these efforts. However, development and deployment of training and certification programs take time and will likely not begin turning out significant numbers of qualified practitioners before the proposed GBSC requirements go into effect in 2011.

Capacity and ability of building departments and building inspectors may not be sufficient to enforce requirements for commissioning all non-residential buildings ≥10,000 sf. The commissioning process is a highly technical process resulting in numerous complex deliverables that will need to be submitted and acknowledged by already overburdened and sometimes minimally-trained building department staff.

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[1] PECI. 1998. "National Strategy for Building Commissioning. U.S. Department of Energy"

2 Evan Mills. 2009. "Building Commissioning: A Golden Opportunity for Reducing Energy Costs and Greenhouse-gas Emissions"

The CCC advocates for a long-term plan to achieve widespread compliance and enforcement of commissioning requirements, including a significant commitment to training and outreach for all parties affected by the Standard.

Training is needed to ensure that commissioning service providers possess the appropriate knowledge, skill, and certification required to fulfill the requirements of the GBSC. As mentioned, a number of commissioning training and certification programs exist today, with efforts underway to expand the availability and quality of commissioning training. Any additional support for development and deployment of training and certification for commissioning providers will further accelerate the increased number of providers needed.

Outreach activities will increase awareness of the GBSC requirements and the resources available to support code compliance. These efforts should be focused on building owners, architects, and designers who will be required to comply with the GBSC, as well as the building officials and inspectors who will enforce the code. In particular, we recommend outreach efforts (as well as any compliance manuals or documentation) reference the following commissioning guides and tools:

- **General guidance on commissioning process**
  California Commissioning Guides: New and Existing Buildings:
  http://www.cacx.org/resources/commissioning-guides.html

- **Large buildings and/or buildings with complex systems**
  ASHRAE Guideline 0-2005; http://www.ashrae.org
  Energy Design Resources Cx Assistant:
  http://www.energydesignresources.com/Resources/SoftwareTools/CommissioningAssistant.aspx

- **Small buildings**
  CA Department of General Services, Commissioning Toolkit for Small Buildings:
  http://www.green.ca.gov/CxToolKit/default.htm

Additionally, we advocate for clear references between the GBSC requirements in Part 10 of Title 24 with other relevant sections until GBSC requirements are fully integrated into Parts 2, 3, 4, 5, and 6 of Title 24 (as indicated in the Initial Statement of Reasons, Page 1). For example, we recommend referencing existing acceptance testing requirements (Part 6, Title 24) in the GBSC Standard (5.410.2.4), as these requirements cover many of the systems that will require test procedures during the functional performance testing required in the GBSC Standard. Acceptance testing requirements adopted into the Standard in 2005 were considered a first step toward comprehensive commissioning requirements, much of which is now proposed in GBSC. Tying these sections together as early as possible will strengthen the Standard and improve clarity and usability for those who are involved in code compliance and enforcement.