



# What Owners **and** Pro Should Know About Building Commissioning *(And Each Other)*

By Diana Bjornskov

**I**n early 2014, the Building Commissioning Association (BCA) surveyed two different building community groups about their perceptions and results of commissioning—one directed at a wide range of large and small commissioning provider firms (Providers) in North America, and one directed at owners and decision-making managers of large portfolios (Owners) of higher education, hospital, and government facilities. Altogether, 189 portfolio Owners, with properties ranging from 15 to hundreds of buildings and more than 16 million square feet, responded across the same regions as Providers.

Several topics intersect between the two surveys: 1) Owners' perception of quality commissioning, Providers' quest for Owners who understand how quality commissioning is accomplished and what it achieves; 2) Owners' drivers for commissioning and Providers' view of market drivers; and 3) Owners' concern for project cost versus Providers' concern for a cost-effective performance outcome.

# viders



## OWNERS

Owners were asked about the greatest challenges they face in commissioning (or Cx) across their portfolios. Some of the challenges they described are internal to their own organizations. Other challenges they placed squarely on provider quality—thoroughness, consistency, responsiveness, and accountability, as well as experience and understanding of specific building types. The Owners’ survey indicates their most challenging commissioning issues are distributed as shown in the table at right.

Although more than one-fourth of Owners indicate that quality delivery of commissioning services is a problem, an equal number (25%) of portfolio Owners said they rarely or never include Owner’s Project Requirements (OPR) in projects, and 41% say they do not require or request Providers to be certified in the commissioning profession.

## CX PROVIDERS

In response to a question about challenges, Providers listed their three most important factors for ensuring performance as

- Continuous team engagement by the Owner, design and construction teams, and Provider
- A thorough OPR to document needs and expectations, and
- Functional testing.

Many indicated that Owners and design teams don’t always see commissioning as a *quality assurance* process, or they see commissioning as a “cost with no perceived benchmarks.” According to many respondents, Owners often don’t realize how important design phase commissioning is, or don’t recognize that commissioning is a valuable asset to ensuring the building will operate as intended.

Providers are challenged by issues such as increasingly complex and differing building systems and controls, and by mixed signals from Owners. For example, when asked, “On a scale of 1-5, how important is *post-occupancy* commissioning in your business?,” a full 41% of Providers said it is considered only somewhat important or not important at all—on the other hand, 49% said that Owners are asking for persistence of savings, which would be measured or optimized through post-occupancy commissioning. Providers also cited these increasing challenges:

- Improved business activity (i.e., although beneficial, growth is a challenge)
- Continued budget stress on new construction
- More emphasis on infrastructure issues, such as information technology
- Campus or multi-building utility delivery
- On-site power or combined heat and power

## SURVEY COMPARISON

The two surveys were not designed to correlate. They differed in purpose, yet several interesting and related themes surfaced by comparing the two. A mutual understanding of three particu-

Owner Issue	%	Description
Quality	27%	Provider thoroughness, skill, experience, responsiveness, accountability, consistency/standardization, understanding of building types
Time/Schedule	20%	Early engagement, time available, speed to complete, proper scheduling, milestone identification
Cost	17%	Capital asset budget and expense, project cost, escalation, value engineering
Project Teamwork	10%	Communication, coordination, integration, team input and cooperation, contractor engagement, volume of work prohibits adequate participation
Operations Staffing	8%	Internal engagement, not enough staffing for commissioning and operations personnel
Monitoring	5%	Post-occupancy building automation and energy management system monitoring, monitoring-based commissioning (MBCx)
EBCx Funding (Existing Buildings)	5%	Funding available to retrocommission poorly performing buildings and systems
Management	4%	Management buy-in, justification, viewpoint, education
Complexity	3%	Project management, complex systems and controls, scheduling, design
Energy Use	1%	Energy efficiency “first” attitude overrides other commissioning concerns

lar issues and how they affect Owners and Providers would better serve the interests of both: quality of commissioning services, communication, and building performance.

## 1. QUALITY OF COMMISSIONING SERVICES

**Downside Conclusion:** Owners are often confused about the role of Providers, and can be frustrated by the quality of work they expect commissioning to provide, while Providers are often hampered by Owners' lack of participation or commitment to the commissioning process.

**Upside Solution:** Time and again we hear that "educating Owners" is one of the most important solutions to reduce or avoid the misunderstandings that occur between Owners and Providers, but what kind of education? In addition to consistent advocacy and messaging about the success of commissioning, here are several topics that should be addressed more formally:

1. What commissioning *is*—and is *not*
2. How to conduct a qualifications-based selection process
3. What the OPR can/should do to facilitate on-time, on-budget, decreased-risk, team-based project delivery
4. Why a comprehensive, whole-building commissioning approach to integrated systems and energy efficiency increases project success
5. What certification means and how the certified commissioning professional (CCP) works for Owners

Here are examples of quality challenges faced by both Owners and Providers. *In their own words...*

### Owners' Quality Challenges

- Skill and experience of commissioning professionals.
- Thoroughness of overall Cx efforts across all phases of project life cycle on consistent basis, with early involvement of staff for training a close second.
- Expertise of companies dealing with old buildings that have old systems with poor or no documentation.
- The number of non-qualified technical commissioning firms that have grown due to the LEED process. The LEED commissioning process has significantly impacted the industry.

### Providers' Quality Challenges

- Ability for an owner to evaluate commissioning agents on qualifications and not just price.
- Owners' lack of knowledge about the benefits of including our team early on in the process. In the end they wish we were involved earlier.
- A widely held misconception (by Owners) regarding the depth of technical knowledge that exists among the design team with regard to building science and fully integrated, whole-building performance.
- Understanding new systems and technologies, how they should be integrated and tested and, more importantly, how test standards and methodologies should be applied to those systems and how proper interpretation of test results will continue to be critical.

## 2. COMMUNICATION AND TEAMWORK

**Downside Conclusion:** Providers are expected to work with Owner project team members at many levels of the project's organization and/or are often limited to less-than-adequate participation. Owners generally work with the design team and—if at all—only one lead Provider.

**Upside Solution:** Full project team engagement and Owner recognition that Provider involvement throughout the project, are imperative. Integrated teamwork is an opportunity for all project members to both teach and learn. It is useful to document project team members' agreement and commitment to schedule and milestones at the beginning. When LEED certification is a goal (and architects often provide LEED consulting services), Providers should be LEED-Accredited and should work with architects early on to be in lock-step toward achieving that goal. For large projects, architects are often the closest advisor to the client, writing the specs, and holding the systems design team contracts; using the OPR, Providers can help ensure the inclusion of other project members (MEP, contractors, operations personnel) in a timely way. *In their own words...*

### Owners' Communication & Teamwork Challenges

- Getting staff to assist and get more involved in the commissioning process.
- We hire third-party Cx and testing and balancing (TAB) firms, and they sometimes do not compare final results, with the TAB firm lagging behind and making changes not captured in Cx report.
- Getting the general contractor and the commissioning agent to incorporate commissioning milestones and events into the master construction schedule.
- Making sure the contractor allows time for commissioning in the schedule and doesn't cut into it when running late at the end.
- Cooperation from the MEP design professionals and contractors with the commissioning agent.

### Providers' Communication & Teamwork Challenges

- Not having the ability to provide critical input to the owner and design team when the owner's project requirements are addressed.
- Consistently "nagging" contractors to provide a quality product...low bid doesn't cause high quality. Aligning client expectations/needs, designed performance, and actual operational performance.
- Project management collaboration platforms that manage communications, actions and documents for the entire project team from design, construction, commissioning through occupancy (i.e., building integration modeling like BIM 360)
- With staff turnover and manpower issues on project sites, a consistent face that represents the owner that will document the successes of the project will be an important part of turning over a successful building.



### 3. BUILDING PERFORMANCE

**Downside Conclusion:** Owners are not always able to meet the commissioning goals and performance requirements they envision for their existing and new buildings. Providers identified some of the most important factors for ensuring building performance.

**Upside Solution:** Successful building performance is measured in both technical and experiential ways, starting with building turnover and ongoing after project delivery. A comprehensive commissioning schedule that includes operator training and post-occupancy commissioning to “tweak” the systems allows for managing the building under true operating conditions. Monitoring-based commissioning (MBCx) is increasingly used to test systems integration and optimize performance over time. *In their own words...*

#### Owners' Building Performance Challenges

- Facilities are not in use during commissioning so the system tests are not carried out under true operating conditions.
- For existing buildings, there are a lot of factors leading to performance degradation, including repurposing, operator error, insufficient preventive maintenance, etc. Older buildings and cost to bring them up to performance standards and efficiency are a challenge.
- Buildings are so complex that it is difficult to review all of the systems effectively.
- For new projects, the typical commissioning program verifies performance to design, but does not do a good job of optimizing performance to the occupied state.


#### Providers' Building Performance Challenges:

- There will be more pressure to perform commissioning remotely. On the flip side, the new technology like optimization routines, learning routines, fault detection and diagnostic (FDD) software, etc., require a greater human presence during turnover to fine-tune the systems under normal occupancy patterns and communicate the features to building occupants.
- Technology will drive a shift to persistence testing and increase post occupancy monitoring of performance.
- Our single most important factor for building performance is well specified, implemented and commissioned building automation systems (BAS) control logic.
- More complicated controls for mechanical and lighting equipment will require greater levels of rigor during commissioning, require higher quality of Provider (and ultimately drive up cost).

### CONCLUSION: WHAT OWNERS AND PROVIDERS MUST DO

Here are ten recommendations for Owners and Providers to plan and implement the *project process* and achieve *building performance*:

1. Solicit, select, or win work based on a qualifications-based selection process that meet the needs of your building
2. Engage commissioning provider in time to work with design team
3. Make time to create the Owner's Project Requirements together
4. Be involved in the project—early and often
5. Define clear expectations for all participants in the project
6. Ensure project managers support the Cx process and milestones while managing construction
7. Document integrated project team commitments
8. Focus on building optimization/performance in resolving construction issues
9. Train operations staff well
10. Verify operation through ongoing or periodic monitoring (MBCx) and occupant inquiries

For more information about this study, view the full report on the Building Commissioning Association's website at <http://www.bcx.org/knowledge-center/>. 

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