



What is Building Commissioning?

Commissioning is a quality-control measure involving the testing, inspection, and documentation of building systems and equipment to ensure each component and system is functioning according to design intent and owner requirements. Commissioning coordinates the traditionally-separate functions of equipment startup, system calibration, balancing, and employee training for efficiency, consistency, and safety.

What is the Value of Commissioning?

As an objective, third-party measure, commissioning brings value and confidence to any project, large or small. It does not detract from the responsibilities of engineers or contractors, but instead enhances relationships between all project team members and building owners. While all consultants, building trades, and vendors involved in a project are responsible for their individual components or systems, commissioning confirms all of those pieces work together as a whole. Commissioning demonstrates to the client that the entire project is operational and will perform at optimum conditions, and it gives building or facility managers the documented tools to operate and maintain each system correctly.

How Does Commissioning Work?

Commissioning should be considered during a project's earliest stages. Input from a commissioning agent can help an owner establish equipment requirements and system performance standards at the start of a project. During the design phase, commissioning ensures construction documents represent design intent and that building systems are integrated properly. Functional checklists are developed for each system to be commissioned. In the event of value-engineering, commissioning agents can review documents to confirm any redesigns continue to meet owner requirements. Commissioning agents perform functional tests, identify deficiencies, and coordinate with contractors during construction to avoid or overcome problems. As a project is completed, commissioning agents provide summary reports, training guidelines, and documents to close out the construction phase of work, verify all work is complete, and ensure design parameters are met.

What Are the Cost & Risk Implications of Commissioning?

Building owners and tenants are realizing that building commissioning has become a standard practice. Consequently, more firms are offering commissioning services that amount to little more than surveys and checklists. Clients are faced with a choice of commissioning provider – choosing a provider based on low price alone raises the risks for poor building performance and lack of value from the commissioning process.

The US Green Building Council (www.usgbc.org) provides commissioning guidelines and standards. In the USGBC-endorsed white paper, "The Value of the Commissioning Process:

Costs and Benefits," authors Dorgan, Cox, and Dorgan assert, "If your Commissioning Authority for your project cannot clearly document that their fee has been recovered during design (early construction at the latest), you are not properly implementing the Commissioning Process."

In the past few years, the price for commissioning has fallen, but cautious clients should be aware that some prices are so low as to preclude a commissioning provider from reasonably performing tasks necessary for successful commissioning. An old rule of thumb was around \$1 to \$2 per square foot. The current industry average is now between 50 cents and \$1 per square foot. This cost is based on standard commercial buildings with few complex, technical systems. Small buildings, laboratories, research facilities, and manufacturing plants will cost more to commission. If an owner expects to pay less for commissioning, a greater risk should also be anticipated.

The risk a client runs is that a commissioning agent will provide standard checklists to be completed by a busy construction manager or subcontractors without time, inclination, or understanding to do so. Few construction contracts are written to include such tasks and may result in additional contractor fees or simple sign-offs by contractors too busy to review materials seen as "out of scope." Compounding the issue of who completes the checklists, the surveys may not be tailored to the specific project or cover adequate details to ensure compliance with design documents or specifications.

Checklists may be improperly used to pick random samples of each system to review. If this method is used during the functionality testing phase of a project, it is likely that some systems will not operate as expected when a project is completed. Reviewing a few documents and testing a few systems cannot identify problems unless some degree of luck is involved – not a risk any clients should take.

Instead of checklists, a commissioning agent should do thorough system walk-throughs and incorporate a comprehensive testing strategy, reviewing the construction schedule, identifying milestone system completion and vendor start-up dates, and coordinating complete system testing with all responsible contractors and the client.

Is Your Commissioning Agent an Integral Team Member?

A risk of low-cost commissioning agents is that they are not an integrated part of the construction team and can be perceived as outsiders or “babysitters,” leading to animosity or conflict during the commissioning process. Nothing hurts a project more than lack of cooperation between a construction team and a commissioning agent. The best way to ensure all members of the project team view the commissioning agent as a key player is to engage them early and maintain an open dialogue with all team members throughout a project.

Can't the Design Team or CM Review Building Systems?

Some clients feel that the design team or construction manager is responsible for system reviews, integration, and punch-lists. While it is true that each of these team members will perform reviews and walk-throughs, these are done late in construction and may add to project costs. On most projects, the construction manager is too busy coordination schedule and construction to focus on details and the design team will not perform reviews until systems are substantially complete. A commissioning agent is available to review installation, assist with start-up, and perform functionality testing of all building systems.

What Should a Good Commissioning Agent Provide?

Clients should expect a commissioning agent to have knowledge of similar building systems as are being installed, and significant hands-on experience troubleshooting and problem-solving. There are few low-cost commissioning providers who offer a base of knowledge and experience. A strong commissioning agent can ease the burden on a construction manager, coordinate activities with subcontractors, and identify and resolve problems early.

A good commissioning provider will maintain a log that identifies issues found during the commissioning process and will help

identify methods to correct issues and team members to perform corrections. If a commissioning agent is only on site occasionally, or only at the very end of a project, it is impossible for them to perform these functions without becoming a “finger-pointer” or creating animosity. A client should engage a commissioning provider who will be an integral project team member, who will be on site regularly, working hard to identify issues and play a key role in their resolution. With the added service comes an added cost, but one which significantly decreases risk.

The commissioning agent can provide documentation for a robust preventive maintenance program after commissioning occurs. However, many commissioning providers only complete a report at the end of a project. Providing a comprehensive, detailed turnover package may result in added costs, but will save on maintenance and repair expenses over time.

You Get What You Pay For!

The cost of commissioning is only a fraction of building costs. A building is expected to operate for years. When you consider these two facts, paying a little more for a strong, experienced commissioning provider is well worth the cost. If you had a heart problem, would you go to a heart surgeon because he had the lowest price? Building systems are the heart of a building – why run the risk of failure by trying to save a few dollars. In commissioning, you truly get what you pay for.

Why Precis Engineering?

Precis offers comprehensive engineering design and consulting services, including true, third-party commissioning for LEED, ASHRAE 2005, and 1.1 standards. The Precis commissioning staff is experienced in the commissioning of multiple systems, including heating, ventilation, air conditioning, normal and emergency electrical, plumbing, life safety, and building automation systems. Most importantly, the Precis team works with each client as an individual, tailoring the services and commissioning process to meet your needs. Our commissioning services are designed to improve the construction process, enhance operations, and ensure future field execution and systems functionality according to your precise requirements.

Call Us to Learn More:

Harry B. Koons, III, CxA, LEED AP
Director, Commissioning Services
Precis Engineering, Inc.
20 South Maple Street, Suite 200
Ambler, PA 19002
215.540.9800 Ext. 239
hkoons@precisengineering.com