

What You Don't Know About Building Commissioning.....Could Cost You

What exactly is Building Commissioning?

Building Commissioning is the systematic process of proactively verifying that building systems are designed, installed, thoroughly tested and capable of being operated and maintained to perform as intended and as the owner expects and believes. A commissioned building provides optimized energy efficiency, indoor air quality and occupant comfort, as well as a foundation for minimal operation and maintenance costs.

Commissioning is not a new concept. It has been utilized for many years in the military, most prominently for Navy ships and submarines. As building systems have become more complex and system integration becomes necessary for life-safety and proper indoor environmental quality, building owners have been including commissioning agents in the design, construction and building turnover process.

BUILDING COMMISSIONING IS NOT:

- *Construction observation (punch list)*
- *Start-up*
- *Testing, adjusting and balancing (TAB)*
- *Final punch-out*

Because Building Commissioning goes beyond equipment inspections and start-up, several organizations have written specific standards and guidelines for the commissioning process. Most notable is the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) that has published ASHRAE Guideline 1-1996 *The HVAC Commissioning Process*.

Shouldn't our design and construction team already be doing this?

The Commissioning Process is adopted by an owner to consistently achieve successful construction projects. It is not an additional layer of construction or project management – it is the owner's means of verifying that the planning, design, construction and operational processes are achieving their goals, and ensures the delivery of a high quality building. Some A/E and CM firms can provide commissioning as per the industry standards and guidelines if they are additionally compensated to perform these specialized services.

Aren't the contractors who are installing the equipment performing testing to ensure the equipment works properly?

On most building projects the responsibility for the installation and functionality of equipment is divided amongst many contractors and sub-contractors. Each one is focused solely on their portion of the project and only conduct testing on the equipment for which they are directly responsible. The Commissioning Agent spends the essential time to test the equipment in an integrated manner to assess total system operations.

Most owners may want to believe that the significant financial investment they are already making guarantees they will receive a well-designed and functional building. However, this doesn't happen enough of the time to rely on it. In the brutal low bid construction environment, corners will be cut.

What services can I expect to receive from the Commissioning Agent?

The services of the Commissioning Agent extend well beyond the normal design and construction process and requirements. A trained Commissioning Agent will put your building through an extensive set of tests to see just how it will work under normal operating conditions. These tests will detect any faults or problems before the owner takes possession and occupies the building.

Generally these commissioning services are not only performed during construction but also for 12 months after the building has been occupied.

Additionally, the Commissioning Agent will develop customized building system operational manuals, preventive maintenance plans, perform extensive operator training, monitor energy usage and system performance.

Is Commissioning beneficial for every building?

Not every building can benefit from commissioning. Many older buildings had simple heating systems installed for occupant comfort that due to their simplistic design may not have benefited from comprehensive commissioning. However, today's modern buildings have complex indoor environmental requirements that rely on integrated heating, cooling and ventilation systems to meet code requirements and provide occupant comfort. These complexities combined with the rising costs of energy make it essential that these systems not only operate properly but that operating personnel are well trained and thoroughly understand their new buildings systems.

Commissioning can benefit buildings that have these complex systems by providing owners with services that have tremendous value and savings. Additionally, commissioning is not only reserved for new construction. Retro-Commissioning is also performed regularly on existing buildings that exhibit high energy usage and comfort problems.

Why should I pay for Commissioning? What are the benefits?

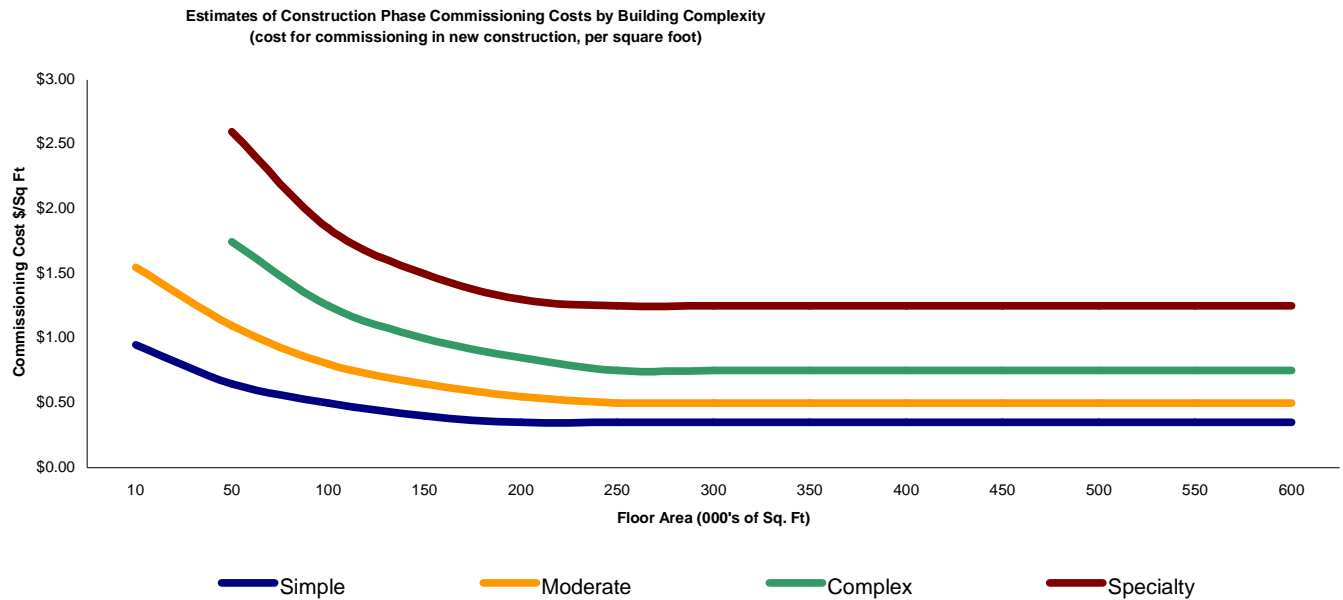
Just as we rely on lawyers and accountants to navigate tax law, we need to begin using commissioning professionals to help us navigate the complicated process of designing, building and operating buildings properly. More and more building owners are beginning to realize that commissioning typically results in lower lifetime costs. Spending a bit more time, effort and money on the front end of a building project can save for years to come.

Specific Benefits Include:

• <i>Reduced operating costs</i>	• <i>Improved IAQ and occupant comfort</i>
• <i>Reduced change orders</i>	• <i>Increased life of existing equipment</i>
• <i>Reduced absenteeism</i>	• <i>Reduced warranty issues</i>
• <i>Fewer comfort problems</i>	• <i>Documented maintenance requirements</i>
• <i>Improved staff training</i>	• <i>Reduced contractor callbacks</i>

What does Commissioning cost?

Generally, commissioning services range from \$.50 to well over \$2.50 per square foot of space, depending on the complexity of the space and the systems installed. The graph below illustrates how these costs span across various complexities of building types.



On average, the operating costs of a commissioned building range from 8-20% below that of a non-commissioned building.

When does Commissioning generally start?

Ideally commissioning starts during the design process. The Commissioning Agent works closely with the design team and owners to ensure different options are evaluated and that the owner clearly understands the benefits of various controls and HVAC systems. The Commissioning Agent will also review the construction documents to verify accuracy, completeness and constructability of the design drawings and specifications in order to avoid potential change orders and assist in developing recommendations to improve areas that might be perceived as vague or confusing by the contractor. Incorporating commissioning during the design phase will provide the building owner with the most value and benefits commissioning offers.

Building owners should not be dissuaded from utilizing commissioning professionals just because design has been completed or construction is underway. Building commissioning can also be performed at various stages of the construction process with tangible benefits.

What happens if buildings aren't Commissioned?

Many building owners are concerned that the savings and benefits will not outweigh the costs of commissioning services. Problems with building equipment and systems that are identified long into the full operation and occupancy of a building are the responsibility of the owner, regardless of when the problem actually occurred. These problems will most likely manifest into additional costs for resolving these issues, the disruption of occupants, reduced productivity and increased energy costs.

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Building owners that have incorporated commissioning into their construction projects have realized that there is an alternative to spending 6 to 24 months to resolve building problems after construction has ended and the contractors have moved on to other projects. They have also recognized that there is significant benefit to resolving these issues prior to occupancy, when no occupants or programs need to be disrupted or displaced, and prior to final payment to the contractors.

Does Commissioning adversely impact the construction schedule?

No. If commissioning is done properly and the Commissioning Agent is effectively integrated with the design and construction team, commissioning will not adversely affect the schedule, and in most cases, it shortens the total construction and turnover schedule.

Where can I find out more information about Commissioning?

There are many websites dedicated to informing and educating building owners on the value of commissioning. Some of the more inclusive and interesting websites are the following:

Portland Energy Conservation Inc.: www.peci.org

Oregon Department of Energy: www.energy.state.or.us/bus/comm/bldgcx.htm

Building Commissioning Association: www.bcxa.org

U.S. Green Building Council: www.usgbc.org

U.S. Department of Energy: <http://www.eere.energy.gov/buildings>

National Clearinghouse for Educational Facilities: www.edfacilities.org/rl/commissioning.cfm

BuildingGreen Suite: www.BuildingGreen.com

This is a subscription-based service that provides access to featured articles on green buildings, green product listings and searchable case studies.

