

Commissioning at Georgia Tech

Since first adopting the practice of commissioning buildings, Georgia Tech has expanded the role and responsibilities of the commissioning agent/authority (CxA). This document is intended to provide guidance in contracting for commissioning services and managing the commissioning process and is an accompaniment to the Integrated Commissioning Process Engagement Matrix Guidelines. The purpose of commissioning is to ensure that systems are designed to meet the project's goals, installed, tested and function as intended, are operating to maximum efficiency and allow ease of maintenance. Additionally the CxA acts as a means to validate that staff is adequately trained and have the resources needed for proper operations and maintenance. To accomplish this, the CxA should be selected early in conceptual design and stay engaged through the warrantee period. Commissioning services shall include all MEP systems, controls and fire alarm but may also include the building's envelope and data systems. All renewable systems such as cisterns and pv arrays shall also be commissioned. While the commissioning agent does not have design authority and cannot relieve the design professional of their standard of care or responsibility to code compliance, the CxA should be considered a member of the integrated design and construction team and be drawn on as a subject matter expert when needed.

In compliance with the Energy Efficiency and Sustainable Construction Act of 2008, all new construction and major renovations over 10,000 sqft shall be commissioned. While this serves as a guideline for when to engage a CxA, smaller more complex projects may also be suitable particularly projects with MEP systems, controls or mission critical spaces. Note also that Georgia Tech's standards for commissioning services go beyond the minimum state requirements. Currently Georgia Tech has an IDIQ Commissioning Agent pool to draw from, however, for capital projects a separate RFQ/P process may be utilized for commission agent selection.

Conceptual Design/Programming

A fundamental requirement of the commissioning process is the development of the Owner's Project Requirements (OPR) and Basis of Design (BOD) documents. The BOD document is the responsibility of the design team, serves to document the design intent and shall be provided to the CxA to ensure compliance with the OPR. Typically Georgia Tech has looked to the CxA to develop the OPR. This is a document that should be developed early in the project's schedule and be completed no later than the end of schematic design. The OPR is developed by taking information from the project's program and expanding through a workshop meeting with project stakeholders to include the end users, operations and maintenance personnel, CPSM representatives and the design team. This document shall serve to define what constitutes a successful project and shall be revisited at each deliverable. The OPR shall include Energy Use Intensity (EUI) goals for the project as well as utility budgeting. These values shall be validated by the energy model at each deliverable milestone and only be amended when approved by Georgia Tech. The OPR is a living document that the CxA is typically responsible for keeping up to date as design decisions are made that influence the OPR such as value engineering decisions. Ultimately, the final version of the OPR should be turned over at the conclusion of the construction phase and shall serve as the Current Facility Requirement (CFR) document.

Design

During the design cycle, the CxA's services shall include review of documents at each deliverable. At a minimum the CxA should review documents to ensure compliance with the OPR and the project's ability to support the commissioning process and measurement and verification (M&V). Additionally the commissioning agent may be asked to serve as a peer reviewer which is a deeper level of review than the minimum requirement. In such a role, the commissioning agent may be asked to review the energy model. In some cases the CxA may also be contracted to develop and execute an M&V plan. The M&V plan should be developed in the design cycle and executed during warrantee. Meters required for the M&V should be modeled in the final energy model so they can be validated in M&V.

Construction

The bulk of the CxA's labor occurs during the construction cycle. The commissioning agent will conduct a kick off meeting early in construction, typically immediately after the CM/GC selects the MEP contractors, that will introduce the team to the commissioning process and review team members' roles and responsibilities and lines of communication. During construction, the commissioning team will conduct site visits to validate installations, review and validate Test & Balance procedures and results, review shop drawings, develop functional check lists and test procedures for the contractor to complete, observe field tests and operational performance tests and validate proper training and close out documentation. The CxA will conduct regular meetings to support the process in construction and develop reports documenting the project's progress for review by the project manager and design team. Operations and Maintenance team members are encouraged to engage with the commissioning team during this period to best understand the systems they will inherit and will often be asked to review and comment on issues that affect them such as access and maintainability. In order to facilitate the commissioning process during construction, functionality of the controls system and remote monitoring will be required. It is important to identify this timeline early in construction so that scheduling can accommodate appropriately as data systems functionality often comes late in construction. The CxA shall define the trending necessary during construction and those trends shall be maintained through the warrantee period for continued review. Note that Georgia Tech is currently piloting fault detection and diagnostic controls packages that will in time support commissioning activities both in construction and warrantee.

Warrantee

During the warrantee period the test and balance agency will typically be required to come back for seasonal test and balance. The CxA will need to be engaged in that effort as they were during the construction period. Additionally the CxA will often need to perform seasonal functional testing as testing prior to occupancy is typically during one season (i.e. winter) such that testing is necessary in the opposing season (i.e. summer) to verify peak performance of systems. At a minimum, the CxA will also be required to do a field review of the systems with the project team and operations and maintenance at 10 months in order to identify any outstanding issues before the warrantee expires. The CxA shall be engaged in solving and resolving any warrantee issues identified. When contracted to execute the M&V plan, the CxA shall also monitor the controls systems remotely and report on them quarterly making suggestions to maximize system performance and efficiency. Installed meters shall be utilized in the M&V and stated goals related to performance (EUI) shall be included in the reporting. The CxA's M&V reporting shall include an evaluation of why EUI goals may not have been met where appropriate and provide recommendations for what next steps should be taken to best meet the project's goals. The M&V period should include quarterly meetings for review with appropriate personnel (TBD?).

Referenced document - Energy Efficiency and Sustainable Construction Standards for State Buildings:
<http://www.dca.state.ga.us/development/constructioncodes/publications/Energy-Efficiency-and-Sustainable-Construction-Standards-FINAL.pdf>