



DESIGN GUIDELINE SID-G **COMMISSIONING**

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Scope

Most projects, especially those with extensive mechanical and electrical systems, will undergo a U-M building commissioning (Cx) process. ~~The U-M Cx process is described below.~~ The U-M Cx process is similar to Cx processes promoted by several national trade organizations, but it involves more comprehensive design reviews and more extensive construction testing. Detailed U-M Cx procedures ensure consistency among projects. Become familiar with, fully participate in and fully support this process.

Related Documents

U-M Building Commissioning Documents:

[Design-Phase Commissioning](#)

[MEP Design Coordination](#)

[Full Project Commissioning](#)

[Project Commissioning for Small Projects](#)

[Generic Sample Commissioning Manual](#)

[Generic Sample Commissioning Forms](#)

[Commissioning Reports](#)

U-M Design Guidelines:

[SID-B - Design Intent Documents](#)

[SID-D – Energy and Water Conservation](#)

[SID-K – Sustainable Design and LEED® Requirements](#)

[SID-L – Owner's Review](#)

U-M Master Specification Sections:

[017823 – Operation and Maintenance Manuals](#)

[01745–019100 – Full Project Commissioning](#)

[01740–019110 – Project Commissioning for Small Projects](#)

Reference Documents:

ASHRAE Guideline 0-~~2005~~, "The Commissioning Process".

Building Commissioning Association, "The Building Commissioning Handbook", ~~2nd Edition~~

USGBC, "LEED® Reference Guide for Green Building Design and Construction", ~~2009 Edition~~

General

Commissioning is a systematic quality assurance process to ensure a project is designed to meet the needs of its Owners, and is built, operated and maintained as intended by its Design Team and its Owners.

- Cx helps a project achieve its schedule, budget and quality goals by utilizing the University's vast design, construction, operation and maintenance experience to proactively identify and help resolve issues as early and inexpensively as possible.
- Cx generally begins during Programming and ends after Occupancy.

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- Cx focuses on the project's exterior envelope, utilities, mechanical systems, electrical systems, plumbing systems and "powered" architectural systems.
- Cx verifies conformance with the project's design intent as documented in the Owner's Project Requirements (OPR) and Basis of Design (BOD) documents.
- Cx verifies that completed systems and equipment perform as intended in all modes of operation and under all operating conditions. Cx does not duplicate or substitute for code inspection. Cx does not provide routine quality control such as inspections for material substitutions, point-to-point wiring checks or poor quality workmanship.
- ~~The U-M Cx process is similar to Cx processes promoted by several national organizations, but it involves more comprehensive design reviews and more extensive construction testing. Detailed U-M Cx procedures ensure consistency among projects.~~

New buildings and major building renovations will undergo design-phase and construction-phase Cx. On a project pursuing LEED certification, the Cx process will include additional activities to earn several commissioning-related LEED points. Most smaller projects will undergo construction-phase Cx only. Cx activities will be coordinated by a U-M assigned Commissioning Authority (CxA).

Design-Phase Commissioning

Design-phase Cx generally will begin during Programming and will continue until the project is bid.

The CxA will participate in the mechanical, electrical and plumbing (MEP) design coordination meetings and perform the following tasks. Incorporate the CxA's input into the project's design.

- The CxA will promote adherence to the U-M Design Guidelines, Master Specifications, Standard Details and Preferred Manufacturers Lists.
- The CxA will promote adherence to the U-M energy and water conservation, sustainability and LEED certification initiatives. See Design Guidelines SID-D and SID-K.
- The CxA will provide "lessons learned" from previous U-M projects.
- The CxA will promote the use of construction mock-ups and other quality assurance techniques.
- The CxA will request that equipment maintenance access spaces be shown on the project's plan drawings.
- The CxA will provide input on the Owner's Project Requirements and Basis of Design documents. See Design Guideline SID-B.
- The CxA will participate in the Owner's reviews of design documents and will provide written comments. See Design Guideline SID-L.
- The CxA will participate in the value engineering effort and recommend cost saving measures.

During the Construction Documents (CD) design phase, the CxA will prepare a project-specific Commissioning Specification Section ~~01710-019100~~ or ~~01715019110~~. Insert this section into the project's Division 1 specifications to define the Contractors' commissioning requirements during construction. In addition, reference this Commissioning Specification section in the ~~Division 2 through 16~~ architectural, mechanical and electrical specification sections for the systems and equipment which require Cx.

MEP Design Coordination

A few major building projects, especially those pursuing LEED® certification, will undergo an enhanced form of design-phase Cx called MEP design coordination.

- The CxA will conduct the MEP design coordination meetings ~~and perform the following tasks.~~ Work Coordinate with the CxA to issue meeting agendas. The CxA will invite the appropriate U-M personnel ~~and conduct the meetings~~. Present your drawings and specifications for detailed discussion. Publish detailed meeting minutes for CxA review within two weeks of each meeting.
- The CxA will coordinate with Plant Operations, Department of Public Safety (DPS), and Occupational Safety and Environmental Health (OSEH) personnel for their input on MEP issues.
- The CxA will resolve conflicting Owner's review comments related to the MEP design, and will assign action codes to the review comments.
- The CxA will identify special requests that are not cost effective or that exceed the project's scope. The CxA will attempt to minimize project scope creep.
- The CxA will serve as the point of contact for the Owner's review of technical studies including studies on sound, vibration, smoke purge, dispersion, electrical capacity, and energy and water conservation.
- On a project pursuing LEED® certification, the CxA will fulfill the design-phase LEED® requirements.

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Construction-Phase Commissioning

Construction-phase Cx generally will begin during Owner's review of the Design Development phase design documents, and will continue through initial occupancy.

Construction-phase Cx will be performed by a Commissioning Team typically including the U-M Project Manager, representatives from the Construction Manager or General Contractor, Trade Contractors, Owner's Representatives, and Plant Operations. The team will be directed by the CxA. Assign an A/E Representative to this Cx Team.

Depending upon project size, the CxA will coordinate the activities listed in either the "Full Project Commissioning" procedure or the "Project Commissioning on Small Projects" procedure referenced in the list of U-M Building Commissioning Documents. Assist the CxA with these activities.

Quality Assurance

Throughout design-phase and construction-phase Cx, the CxA will request that "lessons learned" be documented in meeting minutes, RFI responses, open issues logs, construction reports, and similar project documents. As one means of continually improving the U-M design, construction and Cx processes, these lessons learned will be incorporated in the appropriate U-M Building Commissioning Documents, U-M Design Guidelines and U-M Master Specifications. They will be forwarded as appropriate to the University Architect, the Associate Director of Design and Construction, and the AEC Sustainability Team.

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