Starting Your Project Right

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Successful new construction is the result of setting the right expectations up front and maintaining the project’s scope, schedule, and budget. Commissioning can be of significant help to the project’s success but often relies on the right selection of the commissioning provider and enabling the provider to help in achieving project goals. This session will provide perspectives on how to utilize the request for proposal to get better results from the commissioning provider while also discussing how commissioning can provide support for keeping to the project schedule.
At the end of this session, participants will be able to:

1. When to get the Commissioning Agent involved in your project and which one is good for your facility.

2. How to determine what commissioning services are needed for your facility.

3. How to determine the budget for commissioning tasks and implement them into your Request for Proposal.

4. How to create an RFP so you are getting similar responses and proposals.
Starting a Commissioning Project

- Type of Project
- Understanding Cx
- Boiler Plate Cx RFP
- How to pick a CxA
- Type of Cx Firm
- Why Commissioning?
Building Types
Building Systems
Dept. of Energy (DOE):

*Up to 40% of a building’s energy consumption is due to air leakage.*

Types of Envelope Testing

- Air barrier
- Air and Water
- Infrared
- Roof Uplift
- Other
Other tests

Water Absorption
Seismic Racking
Thermal Performance
Acoustics
Accelerated Aging
Membrane Adhesion
Anchor pull-out
Structural load
Thermography
Considerations

Budget

LEED
Leadership in Energy & Environmental Design

SHAPE®

acg
AABC Commissioning Group

The Association of Energy Engineers

BCxA
Building Commissioning Association
Commissioning Process

Pre-Design Phase:
- Scope & Budget for Commissioning
- Basis of Design
- Commissioning Plan
- O.P.R.

Design Phase:
- Design Review
- Cx Spec Development

Construction Phase:
- Submittal Review
- Site Visits
- Functional Test Procedures
- O&M Document Review
- Pre-Functional Checklists
- Functional Testing

Acceptance Phase:
- Training Review
- Final Cx Report

Operation Phase:
- Seasonal Testing
- Warranty Review
- Lessons Learned

Project Timeline:
What does it Cost?

Table 31.7 Costs of Commissioning, New Construction

<table>
<thead>
<tr>
<th>Commissioning Scope</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entire building (HVAC, controls, electrical, mechanical) commissioning</td>
<td>0.5%–1.5% of total construction cost</td>
</tr>
<tr>
<td>HVAC and automated control system commissioning</td>
<td>1.5%–2.5% of mechanical system cost</td>
</tr>
<tr>
<td>Electrical systems commissioning</td>
<td>1.0%–1.5% of electrical system cost</td>
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</tbody>
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Start a Request for Proposal

- Get a CxA involved early to review your needs, scope and budget.
- CxA can write RFP for Owner.
- Be accurate and complete in your RFP
- Owner does not need to include all building systems if budget is low.
- Owners Project Requirements (OPR) can be issued as part of the request for proposal.
- CxA to write your OPR. Create a Focus.
- Educate Owner on the Commissioning Process
What to Avoid in the RFP

• Overlap of work
  Engineer, PM, CM, CxA?

• Too many site visits
  Multiple visits add up to Big $$$$$$

• Repair of deficiencies
  On new work, contractor is responsible
What's the Difference in Providers?

- Certifications
- Experience: Previous projects & references.
- Different type of Commissioning Providers
- Sample Deliverables
- Interview

Well, Our firm is a BCPx, CSPx, PXA, MEBx, and We are really good!

Huh?
See What’s Important to Your Owners?

- Operating Systems
  Functional Test Procedures
  Functional Testing
- Resolve Issues
  Meeting to verify Issues log items
- Maintenance of Equipment
  Review of clearances and maintenance access
- Continued Energy Savings
  Measurement and Verification
- LEED requirements
  Follow LEED Criteria
(Design Phase)
The design team will be responsible with the CA to develop in-depth design documentation, including design intent, basis of design, and full sequences of operation and logic diagrams for inclusion in the construction documents.

(Construction Phase)
The CA shall work with the Construction Manager and sub-contractors to complete construction checklists and track checklist completion.

Building Type: Healthcare facility
Do they really need all that TAB oversight?

Testing and Balancing

- Review and approve TAB execution plan. *(Construction Phase)*
- **Witness** checkout, TAB, end-to-end testing, and calibration of controls. *(Construction Phase)*
- **Oversee** TAB, to include verification and witnessing of final TAB of all equipment, heat exchangers, air terminals, diffusers, grilles, hoods, terminal devices, and equipment testing, and document findings. *(Construction Phase)*
- **Coordinate & Supervise** deferred & seasonal testing & balancing. *(Acceptance Phase)*

Building Type: Office
Why observe the first coat of paint?

Functional Testing

- Observe pre-functional test of each type of system, including mechanical, controls, electrical, and specialty systems. *(Construction Phase)*

- Witness functional testing of each major piece of equipment to demonstrate that each item of equipment and system is operating according to the Design Intent and contract documents. Functional testing shall include operating the system and components through each of the written sequences of operation. Test on respective HVAC equipment shall be executed during both heating and cooling seasons. *(Acceptance Phase)*

Building type: Offices and Training Center
When an RFP is Poorly Written
A Good Start

Commissioning for LEED

Energy and atmosphere prerequisite 1 (EAP 1)
Requires
• OPR
• Basis of Design
• Commissioning Plan
• Commissioning Specifications
• Performance Verification Documentation (Functional Performance Tests)
• Commissioning Report

Energy and Atmosphere Credit 3 (EAC3)
• All of the Above
• Design Review (at 50% Completion)
• Review Contractor Submittals
• Develop / Review a Systems Manual for Staff
• Verify Training and Completion
• Review Building Operation 10 Months After Completion
Commissioning for LEED

- Scope & Budget for Commissioning
  - O.P.R.
  - Commissioning Plan

- Basis of Design
  - Design Review
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- Submittal Review
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  - Functional Test Procedures
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- Pre-Design
- Design
- Construction
- Acceptance
- Operation
Goal: Define the Owners Need

Goal: Site Investigation to compare building and system performances with the current operational needs.

Goal: For a smooth transition from the Cx team to Building Operations personnel.

Goal: Ensure that the FIM’s continue to perform properly over their lifecycle and they continue to meet the CFR.

Source: Building Commissioning Association – Existing Building Commissioning Best Practices
What do you need?

a.) Plug the Tire  
   $5.00

b.) Patch the Tire  
   $20.00

c.) New Tire  
   $100.00

d.) New Car  
   $25,000.00
Existing Building Cx

- EBCx focuses on the existing building systems performance
- Define the Goals and Identify the problems
- Meet Current Facility Requirements (CFR vs. OPR)
- To “Optimize” the existing building systems
Horror Stories

Tales from the CxA!
Tips for hiring a CxA

• Determine what is important to your building or occupants.
• Remember: Commissioning is a process not a task.
  ➢ Specify tasks that the Owner wants or needs
• Educate yourself and Owner on the Cx process
• Ask for a Commissioning Approach in your RFP.
• Interview and Ask Questions?
  ➢ What Happens If?
• Request Examples of Work.
  ➢ Checklists
  ➢ Final Report
  ➢ FTP
  ➢ Final Report