

Expanded Role of the Commissioning Provider for LEED® Projects

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Commissioning for LEED®



- Energy & Atmosphere Prerequisite 1 - Fundamental Building Systems Commissioning
- Energy & Atmosphere Credit 3 - Additional Commissioning
- 1 out of 7 prerequisites
- 1 out of 69 possible points

Commissioning for LEED®




- Explicit involvement in other credits:
 - EQ Credit 7.2, Thermal Comfort (Permanent Monitoring System)
- Implicit involvement in other credits (verifying installation and performance)
 - EA Credit 1 (Optimize Energy Performance)
 - EA Credit 2 (Renewable Energy)
 - EA Credit 4 (Ozone Depletion)
 - EA Credit 5 (Measurement & Verification)
 - EQ Credit 1 (CO₂ Monitoring)
 - EQ Credit 2 (Ventilation Effectiveness)
 - EQ Credit 3 (Construction IAQ Management)
 - EQ Credit 5 (Indoor Chemical & Pollutant Source Control)
 - EQ Credit 6 (Controllability of Systems)



Commissioning for LEED®

- Who does certification paperwork?





Background

- 22 LEED® projects
 - 2004: 3 of 8 projects
 - 2005: 14 of 17
 - 2006: 4 of 5
- Consistently missed systems-related credits



What is a “LEED® Consultant?”

- Design phase consulting
- Construction phase consulting
- Certification submission and consulting
- Any or all of the above




Commissioning Provider as LEED® Consultant

- More than half of available LEED® points involve building systems
- Design Intent and Basis of Design often not developed; Cx provider can integrate into overall process
- Lower overall fees



Commissioning Provider as LEED® Consultant

- Need to know
 - Documentation requirements
 - Materials strategies
 - KNOW YOUR CIR's!!
- Need to do
 - Organize, plan and document early
 - Assign responsibilities
 - Plan to continually educate team
- Distraction/burden for commissioning provider?
- Some credits may be beyond Cx expertise
 - Site issues can be complex
 - Daylighting can be complex



Credit 1 - Optimize Energy Performance

Credit Documentation or Life Cycle Cost Analysis??

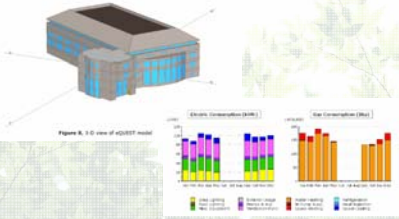




Figure 8. 3-D view of eQUEST model

Category	Energy Consumption (kBtu)	Gas Consumption (Btu)
Electric lighting	~1500	0
Electric plug loads	~1500	0
Electric motors	~1500	0
Electric heating	~1500	0
Electric cooling	~1500	0
Gas heating	0	~1500
Gas cooling	0	~1500
Gas hot water	0	~1500
Gas domestic hot water	0	~1500
Gas other	0	~1500




EA Credit 1 - Optimize Energy Performance

1. Design Engineer energy models often limited to credit documentation
2. Cx provider may have more time to devote to energy modeling during design
3. Cx provider may have more expertise in application of energy modeling
4. Cx provider may be better equipped to expand modeling to Life Cycle Cost Analysis




EQ Credit 3.2


- Two compliance paths
- 2-week flushing option often not feasible
 - System limitations
 - No airside economizers
 - Hot, humid outside air
 - Schedule
- IAQ testing potentially cumbersome, expensive, risky



EQ Credit 3.2 IAQ Testing

- One sample per ventilation system and per 25,000 SF
 - 4 hours each during normal occupied hours
- Test for:
 - Total VOCs
 - Particulates
 - CO
 - Formaldehyde
 - Possibly 4-PC





Credit 5 - Measurement & Verification

Install continuous metering equipment for the following end-uses:


- Lighting systems and controls
- Constant and variable motor loads
- Variable frequency drive (VFD) operation
- Chiller efficiency at variable loads (kW/ton)
- Cooling load
- Air and water economizer and heat recovery cycles
- Air distribution static pressures and ventilation air volumes
- Boiler efficiencies
- Building-related process energy systems and equipment
- Indoor water risers and outdoor irrigation systems



Credit 5 - Measurement & Verification

Develop a Measurement and Verification plan that incorporates the monitoring information from the above end-uses and is consistent with Options B, C or D of the 2001 International Performance Measurement & Verification Protocol (IPMVP) Volume 1: Concepts and Options for Determining Energy and Water Savings.

Who writes the plan??



Fee Examples

- 160,000 SF medical office building
 - \$80,000 commissioning
 - \$30,000 LEED® consulting
- 120,000 SF research lab
 - \$128,000 commissioning
 - \$13,000 energy modeling
 - \$5,000 IAQ testing
 - \$5,000 M&V plan
 - 18% increase in base Cx fee
- 30,000 Core & Shell Mixed Use
 - \$19,000 commissioning
 - \$5,000 energy modeling
- 30,000 University Classroom/Office
 - \$4,000 Certification paperwork (“loser”)




Business Aspects of Other LEED® Services

- 2004: 0% of revenue
- 2005: 10% of revenue
- 2006: 15% of revenue (projected)



Summary

- Advantages to Owner
 - Avoid missed credits
 - Consolidate efforts
 - Decrease consultant costs
- Advantages to Cx Provider
 - Increased revenue
 - Increased design involvement
 - Broaden portfolio
 - Meet client needs



Summary

- Pitfalls
 - Blur the already confusing line between LEED and Cx
 - Unrealistic expectations?

Resources System WorCx
BUILDING COMMISSIONING SERVICES

Energy Modeling
- www.doe2.com (DOE-2 modeling software)

IAQ Testing
- www.epa.gov/iaq

LEED
- www.usgbc.org

Measurement & Verification
- www.ipmvp.org (International Performance Measurement and Verification Protocol)

