Welcome

Commissioning Fundamentals

Presented by:

Stephen Turner

Christopher Armstrong







Presenting today...

Stephen Turner

President, Stephen Turner Inc.

- Rhode Island
 - Vice-Chairman of RI Green Building Advisory Council
 - RI Building Codes & Standards Committee, Chairman of RI Energy Code Subcommittee, RI Rehabilitation Code Board, RI State Energy Plan Implementation Committee
- National
 - Professional engineer registered in NY state
 - Chairman for revisions of ASHRAE Standard 55 on thermal comfort
- International
 - Chairman of ISO Technical Committee 205, Building Environment Design, publishes international standards for building performance





Presenting today...

Christopher Armstrong, Assoc. AIA, LEED APBD+C Lead Commissioning Agent, Stephen Turner Inc.

Rhode Island

- AlAri representative on the Rhode Island Green Building Advisory Council
- Private Sector representative on the RI Public Energy Partnership School Energy Working Group
- Member of AlAri Committee on the Environment (AlAri COTE)
- Rhode Island representative on the USGBC's Upper Northeast Regionalization Committee for LEED-NC v3.0
- Student of building science

National

- Member, Boston Society of Architects Building Enclosure Council
- Member, AIA National IgCC Task Force





What is Commissioning?

"The Commissioning Process is a quality-oriented process for achieving, verifying, and documenting that the performance of facilities, systems, and assemblies meets defined objectives and criteria."

"The Commissioning Process is a quality-based method that is adopted by an Owner to achieve successful construction projects."

ASHRAE Guideline 0-2005, The Commissioning Process





What is Commissioning is Not?

Commissioning is **NOT**:

- An Energy Audit
- A Peer Review
- Special Inspections
- Construction Administration
- Just a bunch of tests at the end of construction
- An additional layer of project management





When is Commissioning Required?

Green Building Standards

- Leadership in Energy & Environmental Design (LEED)
- Northeast Collaborative for High Performance Schools (NECHPS)

Green Building Standards

- ASHRAE Standard 90.1-2010
- ASHRAE Standard 189.1-2011
- EPA Energy Star

Building Codes

- International Energy Conservation Code (IECC 2012)
- International Green Construction Code (IgCC 2012)

Local Laws

- Rhode Island Green Buildings Act (RIGL §37-24-5)
- Rhode Island School Construction Regulations (RIDE 1.00)





What is the Commissioning Process?

Existing Building Commissioning

STI MEETS WITH CLIENT & FORMS PLAN

ESTABLISH BUDGET & FINANCIAL CRITERIA FOR IMPLEMENTATION PHASE

SUBMIT DRAFT OF RETROCOMMISSIONING PLAN FOR REVIEW

COORDINATE RETROCOMMISSIONING TEAM

LEARN THE BUILDING'S CURRENT FACILITY REQUIREMENTS (CFR)

IDENTIFY KNOWN ISSUES

DEVELOP CFR

COLLECT & ANALYZE ENERGY DATA

IF NEEDED, DEVELOP A SUB-METERING, TREND LOGGING, & DATA LOGGING PLAN

REVIEW AVAILABLE AS BUILT INFORMATION

STI PERFORMS INVESTIGATIVE PHASE WORK

DOCUMENT EXISTING CONDITIONS

TRACK ISSUES

SYSTEMATIC ANALYSIS OF EXISTING BUILDING PERFORMANCE

CONDUCT DIAGNOSTIC MONITORING

IMPLEMENT SUB-METERING TREND LOGGING, & DATA LOGGING PLAN

IDENTIFY COMPONENTS & SYSTEMS
TO BE TESTED

ANALYZE SYSTEM LIFE EXPECTANCY

PRODUCE COLORIZED ZONE DRAWINGS

STI PERFORMS TESTING

LEAD FUNCTIONAL PERFORMANCE TESTING

TRACK ISSUES

DOCUMENT RECOMMENDED
TUNE-UP MEASURES

DEFERRED SEASONAL FUNCTIONAL PERFORMANCE TESTING IDENTIFY & DOCUMENT SIMPLE REPAIRS

DEVELOP MASTER LIST OF DEFICIENCIES, OPPORTUNITIES, ENERGY IMPACTS, & UTILITY INCENTIVES STI OVERSEES IMPLEMENTATION OF REPAIRS & RECOMMENDATIONS

OWNER SELECTS REPAIRS & UPGRADES

FINALIZE IMPLEMENTATION PLAN

REPAIRS & UPGRADES ARE PERFORMED WITH STI VERIFYING THE WORK

TRACK ISSUES RESOLUTION

DEVELOP ENHANCED O&M PROCEDURES

DEVELOP SYSTEMS MANUAL & TRAINING PLAN STI REVIEWS TURNOVER

PRESENT SYSTEMS MANUAL

PROVIDE TRAINING TO FACILITY
OPERATORS

PRESENT ENHANCED O&M PROCEDURE

FINAL REPORT

OPTIONAL: ONGOING MONITORING, ASSISTANCE & OPTIMIZATION

PLANNING



ASHRAE Level 1, Energy audit, LEED EBOM, EEp1, EEp2, EEc1 Option 1

INVESTIGATION



LEED EBOM, EEc 2.1

TESTING



ASHRAE Level II, Energy Audit, LEED EBOM, EEc2.2

IMPLEMENTATION



ASHRAE Level II, Energy Audit, LEED EBOM, EEc2.2

HAND-OFF









What is the Commissioning Process?

New Building Commissioning – Design Phase

FORM COMMISSIONING TEAM

DEVELOP OPR

DEVELOP BOD

DEVELOP CX PLAN

50%, 100% SD REVIEWS

DEVELOP CX SPECS

UPDATE OPR & BOD

RESOLVE REVIEW COMMENTS

50%, 100% DD REVIEWS

COMMISSIONING-FOCUSED

DESIGN REVIEW

RESOLVE REVIEW COMMENTS

50%, 100% CD REVIEWS

PLAN FOR

PRE-FINCTIONAL CHECKLIST

FUNCTIONAL TESTS

SYSTEMS MANUAL

RESOLVE REVIEW COMMENTS

OPR & BOD



Owner reviews and accepts initial BOD & OPR

CX PLAN & SPECS



Designers incorporate Cx specs + respond to review comments DESIGN REVIEWS



Owner + designes respond to review comments

PRE-CONSTRUCTION



Owner + designes respond to review comments





INTERESTED IN LEARNING MORE?

CONTACT OUR OFFICE FOR MORE INFORMATION AT
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