Launching of the...

**BECx Collaborative**

**OUR MISSION**
Our mission is to improve the quality and performance of building enclosures by providing resources, education, and information about the current status of the industry that will be useful to building owners, facility managers, contractors, designers, and commissioning professionals.

**WHO WE ARE**
The BECx Collaborative (BECxC) includes organizations and persons working together to improve building enclosures. Together we have participated in writing several Cx guidelines, commissioned numerous building enclosures, written professional articles, and made many presentations to the industry.

In addition, we have developed and presented a number of classes on the fundamental tasks of the building enclosure commissioning process, such as developing the Owner’s Project Requirements, design peer review, and performance testing. For more detail see:
- BECxC History
- BECxC Participants
- Partner Organizations

**KEY RESOURCES**

**For Owners (coming)**
- Example RFQ (pdf), Courtesy: Fiona Aldous
- Example RFQ (doc), Courtesy: Fiona Aldous
- Example RFPs

**For Architects (coming)**
- Example BECx Specifications

**For Contractors (coming)**
- Testing
- BECx Checklists

**For Commissioning Authorities (coming)**
- Example CFPs
- Example Project Reviews

Also, See Resources page for more Resource Offerings

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**CCC Presentation:** July 18 2013 By Joseph Deringer on behalf of the Building Enclosure Commissioning Collaborative (BECxC)
BEExC formed in early 2013

Our mission is to improve the quality and performance of building enclosures by providing resources, education, and information about the current status of the industry that will be useful to:

- building owners,
- facility managers,
- contractors,
- designers, and
- commissioning professionals.
Why commission the building enclosure?

High performance:

- Reduce Risk
- Improve system performance
- Control of heat, air & moisture control layers for project specific climate & building
- Minimize energy usage & gain validity for energy efficiency claims
- Occupant comfort and productivity
- Improve Durability of materials and systems
- Responsible choice of building materials
Construction Documents:

Energy: Toward end of CD

Why Design Review is important

Library

Source: The Weidt Group, from a joint presentation with SuPerB
Is there a performance problem?

• Buildings consume 40% of all energy in the US!
• Responses to concerns demand increasingly higher performance
• By Code or Regulation:
  – Each new version of ASHRAE 90.1 sets lower energy targets
    • 30% reduction 90.1-2004 to 2010
    • 45% - 50% reduction 90.1-2004 to 2013
  – Cities and other governmental agencies are setting lower energy criteria
    • Commonly through LEED
    • Also through the International Green Construction Code
• By Client Demand:
  – Institutional Users, Universities and Hospitals
  – Class A Office space
  – 100 year buildings / low maintenance
• By Litigation:
  – Too many buildings fail to perform as designed and/or constructed
  – Legal claims result.
Role of the Building Enclosure

... defines the layer which protects the controlled interior space, from the extremes of the environment.

The interior and the building enclosure are interdependent.
Examples of BECx analyses...

Heat Transfer Simulation
Transient Hygrothermal Analysis

WUFI Pro 5.0

WUFI-ORNL/IBP - a menu-driven PC program that allows realistic calculation of:

- Transient coupled one-dimensional heat and moisture transport
- In multi-layer building components exposed to natural weather.
- 8760 hour calculations.
- It is based on the newest findings regarding vapor diffusion and liquid transport in building materials
- Has been validated by detailed comparison with measurements in the laboratory and on outdoor testing fields.

http://www.ornl.gov/sci/btc/apps/moisture/
Climate (from 35k ft)
E+ Advanced Daylighting, HP Glass, & Dynamic Shades

Source: E. Nahman, J. Deringer, etal, SuPerB, from parametric E+ studies for project for NIBS and Dept. of Homeland Security (DHS)
Commissioning of Daylighting Systems (DLCx)
Uniqueness of Daylighting Cx (DLCx)

- Daylighting involves design, delivery, & Cx across multiple Systems
- Traditional construction processes ill-adapted to this
- Difficulty of fixing problems once DL installed
- Must identify & fix beforehand
DLCx From Pre-Design thru Occupancy

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Source: J. Deringer & P. Vaidya
Why launch BECxC at this time...
BECx - New to the 30+ years of Cx ...

| Years | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 |
|-------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| HVAC Guidelines | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ASHRAE HVAC GL 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HVAC Guideline 1 Revised | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HVAC Guideline 1 Revised | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cx Process | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ASHRAE & NIBS Collaborate on TBCx | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ASHRAE/NIBS GL 0-2005 Cx Process | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GL 0 Continuous Maintenance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ASHRAE Standard 202 Cx Process | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BECx Guidelines & Standards | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NIBS GL 3-2006 BECx | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NIBS GL 3-2006 BECx | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ASTM Std 2813 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ASTM Standard Guide for BECx | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lighting Cx | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IES DG-29-11 for Lighting | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Building Codes, Rating Systems, Energy | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ANSI/ASHRAE/USGBC/IES 189.1-2011 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LEED 2.0, 2.1, 2.2 & V3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LEED V4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IGCC - BECx not required | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IGCC - BECx is required | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IECC - HVAC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IECC - HVAC & Lighting | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Source: J. Deringer, Building Science Analytics LLC & F. Aldous, WJE Inc.
“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.”

NIBS Guideline 3-2012

“... the process by which the design and constructed performance of building enclosure materials, components, assemblies and systems are validated to meet defined objectives and requirements of the project, as established by the Owner.”

The Guideline 3-2012 Building Enclosure Commissioning

Process available at:  FREE


“This practice is intended to serve as a concise, authoritative, and technically sound practice for Building Enclosure Commissioning (BECx) that is based upon: The Owner Project Requirements; Clearly defined and enforceable levels of BECx; and Minimum core competencies required of the BECxA and associated service-providers (see 4.2) to qualify as Fundamental or Enhanced BECx under this practice.”
BECx Look Ahead

• ASTM “Practice” coordinated with G’line 3 “Process”
• G’line 3 converted to “Standard” language
• BECxA and BES Education and Certification
  – University of Wisconsin, Professional Development Program
    : BECxA Classes & Certification
      (http://epdweb.engr.wisc.edu/Courses/course.lasso?myCourseChoice=N426)
  – ASHRAE Learning Institute
  – AIA Best Practices
  – ASTM Certification – in development
    • Certification by ASTM for BECxA, BES and BET
    • Training for BES & BECxA
Recent & Current BECxC activities...

Education & training High performance:
- ACG ½ day BECx seminar in Chicago (April 2013)
- BECx 2-day seminar with ASHRAE
- BECx Lunch & Learn at HOK SF
- BECx 3-day and 5-day courses with UW

Articles
- Numerous articles
- Two articles in next issue of BCA's Checklist:
  • BECx (F. Aldous & W. Nash contributing)
  • DLCx (J. Deringer contributing)

BECxC Organization
- In process of forming non-profit in CA
- Preparing to apply for 501c3 status
- Expanding website
- Starting a linked-in group
Next steps for BECxC activities...

Guidelines & standards
- Developing BECx ISO standard (underway)
- Developing next generation BECx guideline (2014?)

Education & training High performance:
- Present 1st 1-day BECx seminar at ASHRAE winter meeting in NYC in January 2014

Articles
- Continue to write articles

BECxC Organization
- Get linked-in group working solidly
- Add members
- Form committees with new members
- Collaborate with others (including CCC?)
Questions, comments or follow-up information, feel free to contact BECxC founding members:

FAldous@wje.com  
JDeringer@bsci-analytics.com  
HJEnck@cxgbs.com  
BNash@wdpa.com

Thank-you …

Useful links to develop building enclosure and commissioning knowledge:

www.wbdg.org/

http://www.nibs.org/
National Institute of Building Sciences (NIBS): The building community's connection to the authoritative national source of knowledge and advice.

http://www.bec-national.org/
Building Envelope Councils (BEC): The BECs are charged with providing a forum for the construction industry on building enclosures.

http://www.becx-c.com/
A source for information on the quality and performance of building enclosures by providing resources, education, and information about the current status of the industry that will be useful to building owners, facility managers, contractors, designers, and commissioning professionals.

LOCAL BUILDING ENCLOSURE COUNCILS IN 28 cities around USA and Canada