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WELCOME TO BUILDING ENCLOSURE COMMISSIONING

ONLINE TRAINING

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02

What is Building Enclosure Commissioning?

SECTION - BUILDING ENCLOSURE
COMMISSIONING



What is Building Enclosure Commissioning?



02

WHAT YOU WILL LEARN

- History of Building Commissioning
- Building Enclosure Commissioning
- What's driving building enclosure commissioning?
- Paying attention to details and overseeing performance testing
- Building envelope Commissioning objectives and benefits

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HISTORY OF BUILDING COMMISSIONING

History of Building Commissioning

In the past, ASHRAE was the leader in building commissioning. At first, they focused on building operations and mechanical systems.

Commissioning is a planned process that makes it easier for people to talk to each other, work together, test, and check that building systems are working as planned.

In the last ten years, the National Institute of Building Sciences (NIBS), the United States Green Building Council (USGBC), and several state government agencies, as well as the American Society for Testing and Materials (ASTM), have all made exterior enclosure commissioning an important part of the design and building process.

History of Building Commissioning +

The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) started commissioning as a construction practice when it was founded. At first, commissioning was only used for mechanical systems. However, the program has since been expanded to include all major building systems. The basic commissioning methodology can be applied to building enclosure systems, claddings, and components, including:

- Roofing Systems
- Exterior Walls
- Window walls, curtain walls, and storefronts
- Exterior Doors and Windows
- Sealants, joints, and flashings
- Plaza Decks and Podiums
- Planters
- Foundation Systems
- Below-Grade Walls

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History of Building Commissioning +

- 1982: ASHRAE begins work on commissioning guidelines.
- 1989: Publication of the first ASHRAE guideline on commissioning mechanical systems (updated in 1996).
- 2005—Latest ASHRAE guideline on the commissioning process for the whole building.
- 2006: First publication of NIBS exterior enclosure technical requirements for the commissioning process.
- 2011: The California Green Building Standards Code, including commissioning, was codified into Title 24.
- 2012—Latest publication of NIBS exterior enclosure technical requirements for the commissioning process.
- 2012: ASTM International and NIBS say they will work together to create a building enclosure commissioning process, which they say will help design and commissioning programs for building enclosures get better. As part of the agreement, ASTM Subcommittee E06.55 on Building Enclosure Performance, which is part of ASTM Committee E06 on the Performance of Buildings, will work on NIBS Guideline 3 and publish it as an ASTM Standard Guide.
- The National Institute of Building Sciences (NIBS) is a non-profit, non-government organization that brings together government officials, professionals in the building sciences industry, different labor and consumer groups, and regulatory agencies. One of NIBS's main goals is to find and fix problems in building science and technology in order to make the built environment better.
- NIBS Guideline 3-2012: Building Enclosure Commissioning Process BECx describes the specific applications of the building enclosure commissioning process more generally in ASHRAE Guideline 0-2005. The procedures, methods, and documentation requirements in this guideline describe the application of the commissioning process to building enclosure systems for each building delivery phase, from pre-design through owner occupancy and operation.

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WHAT IS BUILDING ENCLOSURE COMMISSIONING?

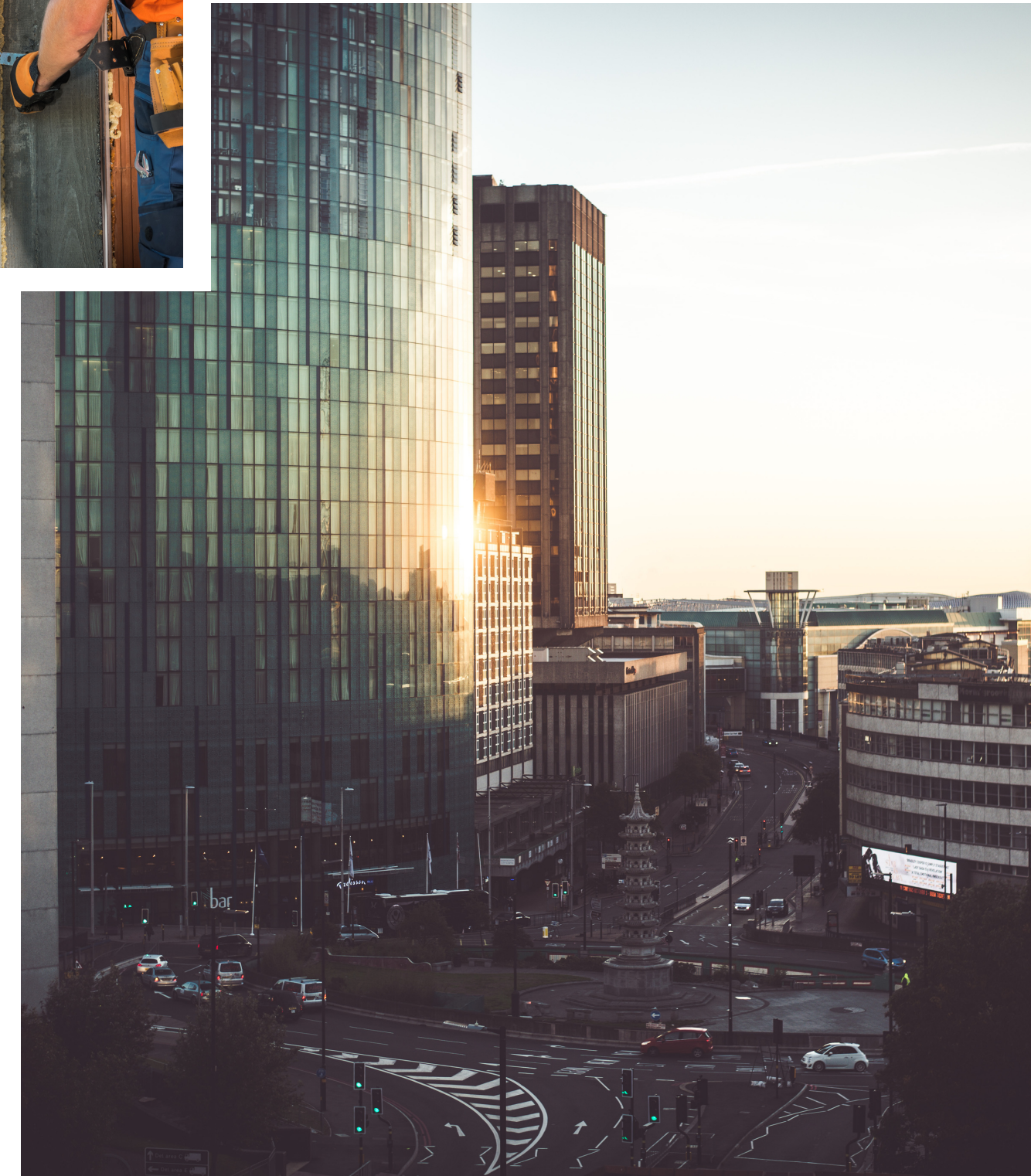
Building Enclosure Commissioning (BECx) (sometimes 'envelope' is used instead of 'enclosure') is a strict quality-focused process wherein the energy performance of a facility, system or assembly is evaluated and verified against defined objectives and criteria. The process itself is carried out by a commissioning team which uses reliable and accurate measures to verify that the project is meeting specific quality requirements outlined by the owner of the project.

Commissioning (sometimes abbreviated “Cx”) is an owner-driven quality delivery process. It means representing the building owner’s interests in high performance, starting as early as the pre-design phase and extending into as much as one year of building operation.

What is Building Enclosure Commissioning?

- The commissioning process begins at project inception and runs through different construction phases, which include a pre-design phase, pre-construction phase and construction phase.
- Once the construction is finished, the commissioning process continues and becomes an ongoing routine in the life of the facility.
- Specific information regarding the commissioning process is outlined in the ASHRAE Guideline 0-2005: The Commissioning Process.
- This and several other technical support guidelines to the Guideline 0-2005 document provide specific information related to the commissioning process.

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WHAT'S DRIVING BUILDING ENCLOSURE COMMISSIONING?

- LEED V4 (October 2016): Basic Commissioning and Verification requires building enclosure design assessment. The OPR and BOD acknowledge the building enclosure commission and reference ASHRAE Guidelines 0 (Cx) and 3. (BECx).
- ANSI/ASHRAE/USGBC/IES 189.1-2011 For buildings over 5,000 square feet, following systems must be commissioned: Thermal, humidity, and pressurisation envelope.
- Chapter 9 of IGCC 2012 covers Commissioning, Operation, and Maintenance. Section 903.1, "Construction or System Needing Verification," covers vegetative roofs, subsurface drainage, foundation dampproofing, flashings, and exterior wall coverings.





Attending to details and supervising performance testing

- Master Spec Section 01 91 19, Building Enclosure Commissioning, is based on ASHRAE Guideline 3 and integrates detail and specification reviews.
- During the pre-design phase, building enclosure commissioning focuses on setting project expectations. The emphasis shifts from quality assurance to quality control and verification during the building phase, and then to owner training and maintenance throughout the occupancy and operations phases.
- Building enclosure commissioning necessitates a thorough examination of all aspects and the identification of any gaps.
- A review of all mock-ups and submittals is included in building enclosure commissioning; job site quality management of construction details may entail a number of checklists, including custom, sequential, or construction checklists.
- Air infiltration, water penetration, water absorption, condensation, thermal performance, accelerated ageing, adhesion, anchor pull-out, infrared thermography, and total building airtightness are all examples of performance testing.

If the persons in responsibility of commissioning are unable to be present on the job site during important stages of construction, they should schedule training sessions ahead of time to guarantee that the details are completed correctly.

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LEED Certification

- BECx helps construction projects achieve LEED certification in addition to building performance and cost savings.
- LEED v4 is the newest version providing more flexibility for individual projects, a performance-based approach to the design, and an expanded focus on materials, looking at the total amount and impact on human health. Reference guides for the newest updates to LEED v4 are available on the USGBC website.
- LEED considers fundamental and enhanced BECx commissioning. All LEED projects must use fundamental commissioning, however enhanced commissioning needs a design assessment by the independent third-party CxA. Basic commissioning involves design approval and field installation mock-ups. Yet, the more BECx services an Owner uses, the higher their LEED score and certification.
- BECx professionals can maximise LEED points. Evan Mills, PhD, a Lawrence Berkeley National Laboratory researcher, calls BECx "the single-most cost-effective technique for decreasing energy, prices and greenhouse gas emissions in buildings today." Here's Mills' study.

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THE MAJOR COMPONENTS OF BUILDING ENVELOPE COMMISSIONING

The Major Components of Building Envelope Commissioning

- Developing the owner's project requirements (OPR) building-envelope-commissioning.
- Developing the commissioning plan
- Reviewing plans, specifications and submittal documents
- Conducting pre-installation meetings and site inspections
- Conducting testing of systems
- Developing systems manuals
- Conducting training for staffing an important part of the design and building process.



BUILDING ENCLOSURE COMMISSIONING OBJECTIVES



- To improve the quality of the design deliverables, write down what the owner wants.
- Check that the systems and assemblies work the way the owner wants them to, as outlined in the Owners Project Requirements (OPR).
- Make a note of the design requirements in a letter called the Basis of Design (BOD).
- Make sure that the owner gets the right proof before, during, and after construction.
- Make sure that the people who run the facility have been taught how to do it right.



Benefits of Building Enclosure Commissioning

- Reduced risk of leaks, disruption, lawsuits, loss of rent, and remedial construction.
- Running expenditures might make approximately 80% of a building's lifespan cost. The U.S. General Services Administration found that "running expenses for commissioned buildings are reported at 8–20% lower than those of a comparable non-commissioned building."
- Less delays Project management solutions help contractors schedule work more efficiently, speeding up construction. To keep the project on track, identify and fix common challenges.
- Early issue identification and resolution can accelerate projects. Revenue properties can create rental revenue sooner, decreasing the high expenses of development money, loans, etc.
- Minimal design influences The trained commissioning agent checks the design and submittals for design concerns. .
- Construction quality control The owner's quality assurance processes to monitor important building envelope components during construction will assist ensure design intent is met. Quality-assurance methods allow the commissioning agent to address many unexpected problems before they cause cost overruns and delays. Building envelope systems are quite complicated.
- Complete construction documents. Including commissioning into the design and construction process provides useful information for building operations and maintenance.

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