



Designation: E2947 – 21a

Standard Guide for Building Enclosure Commissioning¹

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1. Scope

1.1 *Purpose*—This guide provides procedures, methods and documentation techniques that may be used in the application of the building enclosure commissioning (BECx) process. This guide is complementary to Practice E2813 and is aligned with ANSI/ASHRAE/IES Standard 202 and ASHRAE Guideline 0.

1.2 *Extent*—The process outlined in this standard guide applies to each building delivery phase from pre-design through occupancy and operation. The specific application of this guide may vary to suit the Owner, the project delivery method and the building project as described in the Owner's Project Requirements (OPR), and as defined by the contract documents.

1.3 *Primary Focus*—The primary focus of this process includes, but may not be limited to, new construction of building enclosures, existing building enclosures undergoing substantial renovation or alteration, and continuous commissioning of enclosure systems.

1.4 *Contractual and Regulatory Obligations*—The methods described in this guide are not intended to supersede or otherwise replace the contractual obligations reserved specifically for the parties responsible for the design and construction of a building or structure, nor to alter the roles, responsibilities and duties that may otherwise be assigned to those parties by applicable regulatory or statutory law.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

¹ This guide is under the jurisdiction of ASTM Committee E06 on Performance of Buildings and is the direct responsibility of Subcommittee E06.55 on Performance of Building Enclosures.

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2. Referenced Documents

2.1 ASTM Standards:²

E631 Terminology of Building Constructions

E2813 Practice for Building Enclosure Commissioning

2.2 ANSI/ASHRAE/IES Guidelines and Standards:³

ANSI/ASHRAE/IES Standard 202 Commissioning Process for Buildings and Systems

ASHRAE Guideline 0 The Commissioning Process

2.3 Other Publications:

The Architect's Handbook of Professional Practice⁴

The Project Resource Manual (PRM): CSI Manual of Practice⁵

3. Terminology

3.1 *Definitions*—For definitions of general terms related to building construction used in this guide, refer to Terminology E631.

3.1.1 *building enclosure, n*—the terms “building enclosure” and “enclosure” refer collectively to materials, components, systems, and assemblies intended to provide shelter and environmental separation between interior and exterior or between two or more environmentally distinct interior spaces in a building or structure.

3.1.1.1 *Discussion*—The building enclosure may include, but is not limited to, walls, fenestration, roofs, ceilings, and floors (and the intentional openings and penetrations through them).

3.1.2 Refer to the most current edition of the following:⁶

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. (ASHRAE), 1791 Tullie Circle, NE, Atlanta, GA 30329, <http://www.ashrae.org>.

⁴ Available from The American Institute of Architects, 1735 New York Ave, NW, Washington, DC 20006-5292, <https://www.aia.org>.

⁵ Available from Construction Specifications Institute (CSI), 123 North Pitt St., Ste 450, Alexandria, VA 22314, <https://www.csiresources.org/>.

⁶ Selection, interpretation, application, and use of the terminology contained in these documents shall be at the sole discretion of the building enclosure commissioning provider (BECxP). Reconciliation of conflicts in terminology or the definition of terms that may exist among or between these documents shall be the sole responsibility of the BECxP, subject to review and final approval by the architect of record (AOR) and Owner.

3.1.2.1 AIA Architect's Handbook of Professional Practice,
3.1.2.2 ANSI/ASHRAE/IES Standard 202, Section 3,
Definitions,

3.1.2.3 ASHRAE Guideline 0, Section 4, Definitions,

3.1.2.4 Project Resource Manual (PRM): CSI Manual of Practice.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 The following definitions, abbreviations, and acronyms are specific to the implementation of the commissioning process for building enclosure systems. These definitions are applicable throughout this guideline. Terms that are not defined have their ordinarily accepted meanings within the context in which they are used.

3.2.2 *basis of design, BOD, n*—a document developed by the design team that records the technical concepts, assumptions, calculations, decisions, and product selections used to meet the building enclosure OPR and to satisfy applicable regulatory requirements, standards, and guidelines.

3.2.2.1 *Discussion*—The BOD document includes both narrative descriptions and lists of individual items that supports the design process.

3.2.3 *bidding and negotiation phase, n*—preparatory phase of the construction process delivery that assists in the solicitation and selection of prospective bidders, including evaluation of requests for information, substitutions, development of Addenda, review of bids and qualifications and the award of trade contracts.

3.2.3.1 *Discussion*—This phase is followed by the pre-construction sub-phase.

3.2.4 *building enclosure commissioning, BECx, n*—architecture or engineering-related technical services, or both, performed on behalf of the Owner that implements a quality-focused process for enhancing the delivery of a project by focusing on validating during the design phase and verifying during the construction phase that the performance of building enclosure materials, components, assemblies, and systems are designed and installed to meet or exceed the expectations of the Owner as described in the building enclosure OPR, and as defined by the contract documents.

3.2.5 *building enclosure commissioning group, BECxG, n*—the group of individuals, working under direct supervision of the BECxP.

3.2.5.1 *Discussion*—This group may be comprised of a single person or may include multiple subject matter specialists and administrative staff. It is the responsibility of the BECxP to perform each required task or to delegate the appropriate task to the appropriate BECxG member.

3.2.6 *building enclosure commissioning plan, BECx plan, n*—a document that outlines the scope, organization, schedule, allocation of resources, responsibilities, testing, and documentation requirements of the building enclosure commissioning process to meet or exceed the expectations of the Owner as described in the building enclosure OPR and as defined by the contract documents.⁷ The BECx plan should include an outline

of the BECx process, BECx roles and responsibilities of the BECxP, individual members of the BECx team, and the methodology established to verify and documents compliance of the as-built construction with the requirements of the approved construction documents. The BECx plan shall be developed to align with the requirements of the BECx section of the project specification.

3.2.6.1 *Discussion*—The BECx plan may be a portion of the whole building Cx plan.

3.2.7 *building enclosure commissioning provider, BECxP, n*—a duly authorized person or firm in the jurisdiction of the project retained by the Owner to develop, manage, and be in responsible charge of the BECx process.

3.2.7.1 *Discussion*—The BECxP should be trained, experienced, and knowledgeable in the BECx process, and possess and be able to demonstrate proficiency in the core competencies listed in 4.2.1 of Practice E2813. The person or firm performing the role of BECxP should be identified by the Owner. The role of the BECxP may be performed by the building enclosure commissioning specialist (BECxS), the overall building commissioning provider (CxP), or another qualified member to the commissioning group (CxG). Determination of the qualification of the BECxP and BECxG will be at the discretion of the Owner.

3.2.8 *building enclosure commissioning specialist, BECxS, n*—a registered design professional (Professional Engineer or Registered Architect) or duly authorized firm, or both, in the jurisdiction of the project who is retained by the Owner with the applicable experience and technical knowledge of the performance of building enclosure systems, and who is able to demonstrate and maintain throughout the project independence in order to avoid conflicts of interest.⁸ Refer to 1.4 for additional information.

3.2.8.1 *Discussion*—The BECxS possesses the experience and technical skills needed to assess, critique, validate, verify, and support the BECx team during the design and construction phases.

3.2.9 *building enclosure commissioning team, BECx team, n*—the individuals and agencies who, through coordinated actions, are responsible for implementing the Building Enclosure Commissioning Process.

3.2.9.1 *Discussion*—This group may be comprised of the Owner, Architect, Engineer, BECxP, BECxS, BECxT, design sub-consultants, construction manager (CM), general contractor, sub-contractors, manufacturers, and the whole-building CxP.

3.2.10 *building enclosure commissioning technologist, BECxT, n*—individuals or accredited testing agencies, or both, who possess the skills, knowledge, experience, and certification, as required,⁸ to perform the testing outlined in the BECx specification.

3.2.11 *building enclosure owner's project requirements, OPR, n*—a written document that details the Owner's vision and requirements of a project and the expectations of how it

⁷ The BECx plan shall be as defined by ANSI/ASHRAE/IES Standard 202 and Practice E2813.

⁸ The authority having jurisdiction may have more stringent requirements and qualifications for persons performing this role.