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## **Dynamic building enclosure commissioning: reducing risk - by Kristophor Linster**

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A key to avoiding performance issues and costly failures in building construction is about planning, establishing, and validating that the exterior of the facility meets objectives as defined through the process known as Building Enclosure Commissioning (BECx). It has become a major component of evaluating a facility's future performance for building owners to achieve the payback for the expense of commissioning.

BECx is extremely valuable in the pursuit of LEED Certification. It has a direct impact on several LEED credits as well as an indirect impact on many others. Expert firms have been able to develop project specific building enclosure commissioning goals around the strict requirements for building energy systems commissioning. By fully engaging the design and construction team in an interactive effort, a dynamic and collaborative system provides owners further assurance that their building enclosure systems will perform up to their expectations.

The program starts with the development of the Owner's Project Requirements (OPR). The OPR establishes a base for a project giving it a basic structure by which all parties must abide. It is during the OPR process that the BECx agent defines the way a building enclosure will be commissioned for the owner with a commissioning plan that fits within the boundaries of the Basis of Design (BOD) and based on review of building enclosure design development phase document details, components, and materials.

It is during the construction document review process that the building enclosure commissioning agent begins to develop functional performance test requirements for the building that will be executed after installation of each individual system.

At each design milestone, the agent identifies and reviews potential building enclosure design deficiencies and creates action items. Each comment should be either addressed by the team to reach a solution as quickly as possible during construction to adequately eliminate the issues.

The action items are to be completed as construction progresses and then routed to the construction team. Upon completion of each enclosure system installation, a functional performance test will be executed to demonstrate the ability of each system to withstand simulated climate-specific weather conditions.

The program also includes preparation of a hygrothermic model which outlines the building system's anticipated performance, air barrier and infrared thermography testing, the understanding of moisture conditions and the effects of humidity on building wall and roof systems and for the thermal response of those building systems and their components.

The BECx provider will perform air infiltration and water penetration testing of the systems and identify and assess leakage in curtain walls, storefront systems, punched windows, insulated metal panel systems, skylights, and a variety of other fenestration products.

Inadequate indoor temperature and humidity control create environments where some of the most common complaints arise that can often be traced back to air infiltration and/or water penetration. Appropriate retrofits or repairs to restore integrity to the deficient systems, develop remediation plans and oversee the remediation/repair process are part of the BECx providers' responsibility.

It is only through a complete understanding of LEED certification, whole building commissioning, and industry standards that highly qualified BECx providers have been able to provide a deliverable that meets the requirements for LEEDv4.

Using the dynamic enclosure commissioning system, long-term costs and building service interruptions can be avoided. Owners can realize a lifetime savings because they aren't prematurely addressing typical maintenance issues.

BECx services have been documented to provide potential cost savings of up to 100 times over the cost and effort of recladding a building. Utilizing the dynamic enclosure commissioning process a highly qualified BECx provider will help ensure that the mission of the client will remain their primary focus.

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