PUSHING THE ENVELOPE

Building enclosure commissioning provides quality assurance, peace of mind

BY STEVAN VINCI & JAMIE MCKAY
In the current building industry, there is increased focus on achieving aggressive energy efficiency targets, fuelled by local and national industry standards, codes and guidelines. More than ever before, designers and contractors are tasked with delivering higher performing buildings. A critical requirement is to overcome one of the weakest links in energy performance — the building envelope.

**AN EMERGING TREND**

In an effort to reduce thermal bridging and air leakage, and improve thermal comfort, the traditional commissioning process (associated with mechanical systems) has been extended to the building envelope.

Building envelope (or enclosure) commissioning — simply known as BECx — is an independent third party process dedicated to verifying, documenting and testing the performance of building envelope systems to determine if they comply with the design documents and achieve the specified performance ratings.

BECx is not a new concept but it has only recently begun to gain ground as an important element in achieving optimal building performance and a cost-effective method to reduce the risk of future enclosure performance issues. The latter is particularly important since the building envelope represents 10 to 15 per cent of a building’s construction cost today, and approximately 90 per cent of construction defect claims.

**A LESSON IN VALUE**

Many requirements in BECx are similar to those used for mechanical commissioning, such as owner’s project requirements, design reviews and field performance verification; however, there are some differences in the focus, timing and delivery.

Typically, the traditional commissioning process is focused on factory-assembled systems or equipment that are brought on-site, installed and have the capability of being modified or “fine-tuned” in the field to meet the intended performance.

Meanwhile, building envelope assemblies are constructed in the field, comprised of products from different manufacturers and installed by various material subcontractors during all weather conditions. Most of the materials that provide the critical barriers, such as waterproofing, air barrier, and vapour and thermal control, are concealed once envelope construction is complete. At this time, the ability to fine-tune
or adjust the performance of the building envelope systems is difficult and limited. This likely explains why small deficiencies or performance issues often go unnoticed for some time, leading to significant and sometimes catastrophic failures.

There is no doubt that BECx can be very valuable, so long as it is properly implemented early on in a project by experienced individuals and firms. The BECx process focuses on ensuring all building envelope systems are planned, designed, installed, tested, operated and maintained to meet the building owner’s expectations. This provides quality assurance, mitigates risk to the building owner, curtails the possibility of costly repairs, and reduces costly change orders during construction and, consequently, delays.

PUTTING THE PROCESS INTO PRACTICE

BEcx is a multi-step process that begins with the establishment and documentation of the building owner’s project requirements. From here, there are two fundamental requirements of BECx: review of the design documents for conformance to the performance goals and project requirements; and inspection of the installation, testing to confirm performance and review of operations (to ensure implementation meets set goals and requirements). Each requirement is developed and reviewed during several stages throughout the design and construction process.

The single most important component of achieving the performance target is to ensure the building owner’s goals and project requirements are clearly documented. If not, it is virtually impossible to check that performance expectations have been met.

As the project design evolves, often the performance criteria must too (either to gain clarity or to meet other building owner requirements, such as cost and schedule). The building owner’s project requirements and the basis of design are typically living documents that should be reviewed on a regular basis to ensure accuracy with any changing priorities or performance goals.

CONSULTING IS NOT COMMISSIONING

Many projects have a building envelope consultant on the design and/or construction team. While their presence adds value, the extent of their role can vary and may be limited to certain technical issues. The BECx authority, on the other hand, works independently of this team on behalf of the building owner. Their depth of involvement is far greater — the authority must continuously measure the design and construction against the building owner’s expectations — and must begin from a project’s outset.

BEcx is also a more formal process than building envelope consulting. Guidelines have been developed by various industry organizations, such as ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) and the National Institute of Building Sciences (NIBS), which set out a standard practice for the BECx process.

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