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Building envelope commissioning can help avoid common issues in building construction

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The successful performance of exterior building envelope assemblies can be attributed to the planning implemented during the initial phases of the design process, and requiring the combined efforts of the owner, envelope commissioning consultant, design team, and contractors. Building envelope commissioning (BECx) can help avoid common issues in building construction, such as water intrusion and air infiltration, which can lead to indoor air quality issues, mold growth, and energy loss. BEC services are a small fraction of the overall construction costs, and even smaller when considered in relation to the cost of repairs.

Building Envelope Failures

According to industry statistics, envelope leaks are a primary cause of lawsuits against design architects. Once construction starts, contractors are typically focused on constructing the building in accordance with the drawings while remaining on schedule and within budget. The envelope commissioning agent's responsibility is to maintain the team's focus on the critical weather, vapor, and air barrier roles of the envelope.

Implementing Design Phase Envelope Commissioning

The commissioning process should begin when the design team is preparing schematic design documents. The BECx agent conducts workshops with the design team members to discuss which components are to be commissioned and how the process will work. BECx procedures should not slow the design process as peer reviews occur within the timeframe of the scheduled reviews. BECx review focuses on potential moisture and/or air infiltration issues for roofs, walls, sealants, air barriers, flashings, waterproofing, windows, skylights, curtain walls, etc.

Construction Phase Commissioning of the Building Envelope

Many building envelope subcontractors are unfamiliar with the commissioning process, and commissioning workshops are effective. The general contractor (GC) and subcontractors are required to attend. Workshops allow the BECx agent and prime to detail the envelope commissioning plan, various inspections and functional test procedures. The primary goal of workshop meetings is to address the responsibilities of the multiple subcontractors as their systems "tie-into" adjacent systems.

Mockup Testing

Because the walls, window systems, and curtain walls have to be completely constructed before the envelope can be tested for water-tightness, construction mockups are strongly recommended. Photographic documentation is critical to the success of the mockup for setting the standard of quality since components in an envelope assembly are concealed by the next layer of the envelope. Without photographs, there would be no way of referring back to the successful installation to determine if deviations occurred.

Based on changes developed to address deficiencies uncovered during mock up testing, modified details can be developed for incorporation into revised shop drawings. Subcontractors are required to perform their work using the modified details and certify that the work is performed as detailed. The BECx agent and the GC can then follow the mock-up testing with periodic field inspections to determine if the subcontractors are performing the work properly.

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