

IMPORTANCE OF PERFORMANCE MOCK-UPS

PART 1 - Why a Mock-up?

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Building enclosure failures resulting in construction defect claims are one of the building industry's largest litigation areas. One way to reduce these future claims and potential issues is to build and test an enclosure mock-up. This performance mock-up would include using as many of the actual project details, materials, intended installation methods (spray versus rolled air barrier, for example), construction sequence, and, if possible, the labor to be used on the actual construction project. The construction performance mock-up is similar to the automotive industry, which builds prototype cars and performs multiple crash tests to ensure its product is safe for the public to drive.

Also, consider this: building enclosures today potentially utilize hundreds of products from multiple manufacturers, if not thousands. These products contain an unknown number of different chemical compositions (some of which are not chemically or adhesively compatible), are being installed by an industry with a nationally recognized labor shortage, and are being managed and/or commissioned by companies and individuals with varying levels of building science knowledge. Add in the fact that very few architectural schools teach building physics/science to students to understand heat, air, and moisture transfer. It is no wonder insurance claims and litigation from moisture and water issues in construction is a billion-dollar industry annually.

Question: How many architectural firms have chemists, research and development labs, or full-scale testing facilities?

Answer: Very few, but the industry is asking the architects to provide product choices in specifications and to provide builders with accurate designs and details. All of this with the full knowledge that the construction industry and development of enclosure materials are continually changing.

How can the Owner be assured his building is being properly built? Use the building industry's "Crash Test Dummy" – the Performance Mock-up.

The performance mock-up can validate the design, product selection, and proper installation of materials before the installation of final materials on the actual building. Would you build a car for your 16-year-old to drive on the expressway at 70 MPH in your backyard? If you answered no, why would you expect a unique combination of design, materials, and installers to successfully provide an Owner with a leak-free building on their first try? Remember, every building is UNIQUE. Even if you design and select the exact same materials for two identical buildings, there is no feasible way they could be built in the same weather conditions or with the same labor force. It is impossible!

The **performance mock-up** can be built and tested in various configurations and at different cost levels. The most crucial part is that they account for the high-risk areas of a building (foundation to wall, wall to window, wall to roof, expansion joints, penetrations, etc.) and are tested - **for water leakage, air leakage, thermal concerns, and durability**. Also, ensure the people installing the materials on the mock-up will be working on the actual building. What good does it do the project if the knowledge gained by the mock-up is not available for the actual construction of the project? Let's build it right on the building the first time and aim to get the lawyers, litigation, and enclosure failures out of construction.

The author, Brian Stroik, is currently a Performance Excellence & Quality Consultant for American Contractors Insurance Group, Past Chair & Fellow of the Air Barrier Association of America, Past Chair of the National Building Enclosure Council, voting member of ASTM E06 – Building Performance, a Union Trained Carpenter and former manager for a billion dollar construction management company.

This white paper is an overview of a four-part series on performance mock-ups. For more information on Performance Mock-ups, please read:

- **Part 1** - Why a Mock-up?
- **Part 2** - Types of Mock-ups
- **Part 3** - Testing of Performance Mock-ups
- **Part 4** - Project Specific Education from Mock-up Lessons Learned