

How the Right Control Layers Protect Homes From Natural Disasters

Control layers installed in the proper order will create building envelopes that bounce back effectively after a storm.

When Chris Laumer-Giddens noticed a European friend searching for a well-constructed pair of shoes, it was a light-bulb moment for the Atlanta-based architect. “She was picking the shoes apart at the seams to check the stitching,” he remembers. “In Europe, they buy items with the intent of keeping them for a really long time, and that has stuck with me. That’s really how homebuilding needs to be.”

As principle at LG Squared Architects, Laumer-Giddens uses his experience as a Home Energy Rating System (HERS) rater and efficiency expert to design high-performance homes for his clients’ “lifestyle and the ever-changing environment.” With a focus on resilient homes that will withstand everything from hurricanes to wildfires, Laumer-Giddens recommends leaning on a well-designed building envelope to do the heavy lifting of ensuring homes will weather any storm.

Start With the Perfect Wall

Laumer-Giddens says “Perfect Wall” construction is a foundational homebuilding concept widely accepted by the building science community for decades to yield durable homes that are capable of weathering natural disasters. “It really comes down to the ordering of control layers,” he says. “You can have different substrates and different thicknesses of insulation, but as long as you put the layers in the right order, you can have a Perfect Wall in any home anywhere in the world.”

In terms of severe weather, a Perfect Wall assembly has a primary goal of protecting the structure by shedding bulk water first, and then effectively managing any water that does penetrate into the wall. This is especially important when considering wind-driven rain. The 2020 hurricane season saw a record number of named storms with 29 as of early November. Additionally, this storm season saw a record number of storms undergo a phenomenon known as “rapid intensification.” According to CNN, this is a 35-mph increase in a storm’s maximum wind speeds over a 24-hour period.

Homes built with the forethought to manage this type of intense, forceful precipitation are more likely to be able to bounce back from major storms and continue performing as designed. The correct order for a Perfect Wall’s

control layers is to place air- and vapor-control barriers against the sheathing, followed by a thermal control layer (continuous insulation) to the exterior, and then the bulk water control layer (cladding) as the outermost layer and first line of defense against nature.

“Everything comes down to moisture because moisture is what causes buildings to fail,” Laumer-Giddens says. “So this is really all about how well wall assemblies can dry out. It’s fine if water gets into the wall assembly, as long as it gets out quickly. The ability for homes to dry out and recover helps maintain the integrity of the building envelope and the interior environments it protects.”

Resilience Beyond Hurricanes

Hurricanes aren’t the only natural disasters to plan for in residential architecture. Laumer Giddens also considers fire resistance as a control layer in the homes he designs. “Fire is a big issue in the southeast, and our area is known for its trees,” he says. Building resistance to both fire and water into his homes comes down to product selection.

Laumer-Giddens says his firm prefers to work with materials made from stone or metal, such as metal framing, gypsum sheathing, stone wool insulation. Resistance to the elements is built into these materials because they won’t burn or hold moisture, so wall assemblies that incorporate them function well in areas prone to natural disasters and severe weather.

Resilience on a Budget

Most of these materials are available at a wide variety of pricepoints, allowing architects and builders to incorporate them into any home they build, regardless of the budget. Even so, it’s worth looking into materials that add even more efficiencies into the home’s design and construction. This gives architects and builders both the confidence that the materials were installed properly, and the jobsite efficiency of three components installed at one time.

“We’re finding that clients more and more want their homes to stay intact forever, as much as they want it to be comfortable,” Laumer-Giddens says. “We can really use durable materials along with design and execution to make that possible for a lot of homeowners.”

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