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A New Way to Increase Energy Efficiency

Produced by Cathi Sachs & Written by Eric Gundberg

One of the most innovative trends in the construction industry is the design and construction of air barrier systems to control air leakage in and out of a building's envelope. Systems Building Envelope Consultants Ltd. (SBEC), which operates out of Austin, Texas, is one of a handful of companies in the United States that is a licensed consultant to design and build air barrier systems, as well as act as an Air Barrier Association of America [ABAA] licensed auditor for testing and inspecting the air barrier installation during construction. According to Paul Beavers, SBEC president, roughly 40 percent of the nation's energy expenditure is spent on the operations of buildings, and the majority of that is energy that is being used to condition the indoor environment.

An air barrier is a system of building materials – such as membranes, coatings or sprayed polyurethane foam (SPF) – that are designed and integrated to stop the uncontrolled flow of air into and out of the building. In addition to cutting down the amount of energy needed to control the interior air, air barriers help prevent the breakdown of building materials




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caused by condensation, they reduce noise transfer, and they negate the difficulties in balancing heating and cooling systems.

With such strong momentum towards more sustainable building, a proper air barrier system is vital in today's industry. While movements to use recycled materials and geothermal energy are important, if heat is escaping a building due to a faulty envelope any "green building" initiative could be for naught. That's why SBEC plays such an important role in the industry and companies across the region have come to rely upon the firm to analyze all needs, target specific problems and provide definitive solutions.

Increasing Air Barrier Awareness

According to SBEC's website there are the three main forces that cause leakage. These include: "Wind, which is constantly changing the positive and negative pressures on the building envelope; Stack effect, the movement of air into and out of buildings from chimneys, flues, etc.; and the design of a building's mechanical system when heating and ventilation systems promote positive or negative pressures in the building."

To combat these forces the U.S. Army Corps of Engineers (USACE) mandated that all new construction and buildings undergoing a more than 25-percent renovation must have a continuous air barrier system in place. "A lot of the general contractors are unfamiliar with the new guidelines, and more often then not, they don't get in touch with us until after the building has been built, so, naturally, the building fails the air barrier test," explains Beavers. "They need to hire us during the design stage so that we can perform site inspections and then do smaller [confidence] tests during construction, and as a result the building will be able to pass the Building Air Tightness Test at the end. That's why people shouldn't just jump into this field. If they don't understand the building science, they're going to make some big mistakes."

SBEC's team addresses a building's true needs design-wise and economically, accurately evaluating a problem to avoid unnecessary costs for property and project owners through hands-on monitoring and regular observations. Additional services provided by SBEC include visual inspection of the entire roof and/or waterproofing (walls) system and related details; core sampling and analysis to depict roof system configuration; infrared roof/wall moisture surveys to determine if water migration or saturation has occurred; remedial water testing and examination of roof/wall details to determine leak origins; final reports outlining finding, opinions, recommendations, cost parameters and specifications for corrective action; bid reviews, contractor recommendations; project setup and periodic job site inspections.

With the increased focus on air barriers SBEC has seen its business rise dramatically since its inception in 1989 as a wall and roofing consultant. Consequently, SBEC has seen its geographical footprint extend across the country. As a result, the firm's central location has proven to be well suited for travels all over the country to projects such as the various military installations nationwide, including Alaska, Hawaii and Puerto Rico.

"We're in a growth curve right now, but we're making sure that it's a controlled growth. We could very easily overwhelm ourselves," explains Beavers, who remains confident in the company's strategic plan, which additionally includes waterproofing consulting for surfaces ranging from exterior walls, rooftops to balconies to patios on commercial, institutional, mixed-use residential and government buildings.

Soon to be an Industry Standard

Beavers says that the USACE is currently the only government agency that is requiring air barrier systems, but he thinks it will soon be an industry standard. "Some countries are leading the way in regards to air barrier systems. England tests all their buildings for air tightness and Canada is way ahead of us as well. It's a great start with the Corps here in the U.S., but there's a bunch of old-school perspectives out there. It takes a while to re-educate them. Washington is the first state to start testing on a larger scale, but they're not quite there yet. It'll take five to seven years until it's industry-wide."

Drawing on three decades of varied experience, SBEC has put itself in a position to take advantage of the increased awareness of air barrier systems. The firm already has established itself as an industry leader, and has the necessary team of experienced employees to complete any job in the field. As designers and contractors become more comfortable with the learning curve of air barrier concepts, Paul Beavers and Systems Building Envelope Consultants Ltd. will continue to be leading the way educating and improving structures and the industry itself. •