

Is Rain-Screen Siding Worth the Effort?

Horizontal exterior sidings like wood clapboards, vinyl, and fiber cement have traditionally been nailed directly to the underlying sheathing, typically over a water-resistant underlayment of asphalt felt or some sort of housewrap. That's still common practice, but over the past few decades, a more labor-intensive technique known as rain-screen siding has been steadily gaining ground.

Reportedly first recommended by Canada's National Research Council in the early 1960s, the rain-screen approach involves fastening the siding to vertical furring strips, which are usually spaced to correspond with the wall studs. The resulting vertical channels are usually covered with insect screening at top and bottom but are otherwise left open to permit free passage of air. As in a conventional siding application, the OSB or plywood beneath should first be covered with a properly flashed and lapped layer of felt or housewrap.

Draining and drying. According to rain-screen advocates, the open channels tend to reduce wind pressure against the housewrap or felt, making it less likely that wind-driven rain will penetrate imperfections in the housewrap. (In fact, rain-screen siding is sometimes described as "pressure-equalized siding.")

Any moisture that does drive through the siding drains away quickly, while the air space behind the siding promotes rapid drying. That, in turn, may help prevent cosmetic problems — such as peeling paint — and mold and wood rot, which can develop when moisture works its way past the sheathing and into the wall cavity.

The rain-screen approach has long been embraced by engineers and building scientists. Among them is the Massachusetts-based building scientist Joe Lstiburek, who makes a strong case for a $\frac{3}{8}$ -inch vented space behind siding in a recent issue of *ASHRAE Journal*. (That article, "Mind the Gap, Eh?" is available as a PDF at bookstore.ashrae.biz/journal/journal_s_article.php?articleID=987). Such support has helped push rain-screen siding into the mainstream; recently it became a requirement under some U.S. and Canadian building codes. Builders in coastal areas of British Columbia, for example, have been required to provide a vented 10-mm ($\frac{3}{8}$ -inch) air space beneath exterior siding for several years now. And since this past January, Oregon has required contractors to provide a minimum $\frac{1}{8}$ -inch drainage space beneath siding, although the provision can be met without a true rain-screen installation.

Code-based solution. The impetus for Oregon's drainable-siding provision dates back to a large number of moisture-induced building failures in the state during the late '90s and early 2000s. Many resulted from water penetration of synthetic stucco, but various forms of coursed

■ It's long been known that sunlight reflected from low-E windows can melt vinyl siding, but the management of a "green" Las Vegas hotel is confronted by a similar problem on a vastly larger scale. According to the *Las Vegas Review-Journal*, sunlight that bounces off the curved glass façade of the new high-rise Vdara hotel creates a moving hot spot — dubbed "the Vdara death ray" by employees — in the hotel pool area, causing guests to complain of burned hair and melted plastic cups. The hotel's owner, MGM Resorts International, is reportedly evaluating possible solutions. A mobile solar-powered outdoor grill would seem to be one option.

■ Beginning this month, builders in Maine will be subject for the first time to a statewide building and energy code. The Maine Uniform Building and Energy Code took effect on December 1, at which time all existing local building codes became void, although municipalities without a local code don't have to comply with the new statewide code until 2012. The new code gives communities the option of conducting their own inspections or leaving them to state-certified third-party inspectors — a provision that raises a red flag for some builders. "We have real concerns that there won't be enough [inspectors]," Associated Builders and Contractors of Maine president Kathleen Newman told the *Augusta Kennebec Journal*. "And that will delay projects."

siding were also involved. When the scope of the problem began to make it difficult for contractors to find affordable liability insurance, says Oregon Building Codes Division official Richard Rogers, the state legislature pressed building officials to come up with a code-based solution.

At a series of meetings in 2008 and 2009, code officials and the state's Residential Structures Board — a nine-member body that includes four residential contractors — hammered out the final version of an amendment to section R703.1 of the Oregon Residential Specialty Code. To comply, builders must “provide the building with a weather-resistant exterior wall envelope and a means of draining water that enters the assembly from the exterior.” That requirement can be met either by furring out the siding or by using an approved drainage material. To be permitted under the revised code, drainage wraps must pass an ASTM E2273 test (originally developed for water-resistant barriers used under synthetic stucco) that requires that they drain 75 percent of the water introduced to a test assembly within a specified time. Among the products that have so far demonstrated compliance with the ASTM test, Rogers told *JLC*, are Tyvek DrainWrap, Greenguard RainDrop, Valeron Vortec, HomeGuard HP Plus, Benjamin Obdyke Home Slicker, and HydroTex.

Building science vs. field experience. Because true rain-screen siding is labor-intensive and costly — it adds 25 percent to 30 percent to the cost of a typical siding job, according to several builders who have used the approach — code officials portray the stucco-wrap option as builder-friendly. “You have to cover the sheathing with some kind of water-resistant barrier anyway,” says Rogers, “so the added cost is only the difference between a standard housewrap and a drain wrap.”

In effect, the new code provision assumes that some drainage is always going to be better than no drainage. But because years of field experience have shown that siding applied with no provision for drainage can also perform well, the new requirement has generated quite a bit of controversy. Skeptics abound along the Oregon coast, where heavy rains are frequent and sustained winds can top 70 mph.

“Folks on the coast thought [the drainage requirement]

was overreaching,” says Doug Lethin, the owner of a Salem remodeling company and one of the members of the Residential Structures Board. “It’s not a cure-all. They’re already taking the steps necessary to prevent water from getting in.”

Chuck Bergerson, a veteran coastal builder who now manufactures wood doors and windows in a small plant in Hammond, Ore., notes that area builders are particularly dubious about modern housewraps. “Some of them tend to trap moisture,” he says. The regional material of choice has always been 30-pound felt, which Bergerson describes as both thicker and more flexible than the 15-pound version. “It seals better around nails, and it doesn’t end up full of holes if you fasten it with a hammer tacker,” he says.

In addition, Bergerson says, builders along the coast use pan flashings at doors and windows and routinely back siding butt joints with tabs of felt to resist water penetration. “Why would we want to change what already works?” he asks.

Rogers concedes that builders like Bergerson have a valid point. “They’re absolute believers in asphalt felt, and I can see why,” he says. “They do it right without a gap and have had no problems.” Just the same, he defends the new drainage mandate. “Rain-screen is obviously best practice,” he says.

Hard to explain. Rain-screen siding makes intuitive sense. But as the Oregon example — and countless long-lived traditional siding applications elsewhere — makes clear, it’s not the only right way to do the job.

“Like a lot of building science, it’s pretty much unproven,” say Paul Fiset, a professor of building materials and wood technology at the University of Massachusetts. “I don’t know of any studies comparing rain-screen siding to conventional siding in any meaningful way, and I can count the people who can explain how it works on the fingers of one hand.”

Some attempts to clarify the science behind rain-screen siding are as likely to confuse as enlighten. A technical article on the NAHB Research Center’s ToolBase.org website, for example, informs readers that “pressure-equalized rain screens, or PER ... terminate the pressure differential across cladding systems that are magnified by winds. This effectively eliminates the remaining

moisture force affecting rain screens. PER systems employ barriers to compartmentalize the air cavity, thereby allowing rapid air-pressure equalization and minimal moisture intrusion. This limits the opportunity for rain penetration beyond the cladding.” The article has better luck in explaining the principle behind what it calls “simple rain screens,” which it compares to the familiar example of a brick veneer wall with weep holes.

Given the complexity of any explanation that raises the pressure issue, even builders who use rain-screen siding tend to stress the common-sense aspect and go easy on the science. Seattle builder Kyle Keever has done several rain-screen siding jobs recently but says he makes no special effort to sell customers on the idea. “It does cost a lot more,” he says. “I think that both [conventional and rain-screen siding] can work if they’re done correctly. Most people already know what they want by the time they come to me.”

Mark Parlee, a residential contractor in Urbandale, Iowa, calls rain-screen siding “a very good thing” but notes that he seldom has occasion to use it. “If I were

going to do rain-screen more, I’d have to figure out how to present it to customers, and I’m not sure how I would do that,” he says.

Newton, Mass., remodeler Paul Eldrenkamp has been working with rain-screen siding regularly for more than 20 years, most often using strips of half-inch plywood as furring. He believes that it’s not necessarily important to provide continuous vertical drainage channels, having had good results laying wood shingles over closely spaced horizontal furring strips. “As long as you have a good moisture barrier under the furring, the small amount of moisture that gets through the shingles will find its way out,” he says.

Both Eldrenkamp and his customers have been pleased with the results. “I’ve never seen peeling paint over a rain screen,” he says. Even so, he views the method less as an upgrade than as an admittedly pricey form of insurance. “It might be belt and suspenders,” he says. “As far as rain-screen goes, we have two kinds of customers: those who know what it is and want it, and those who don’t know but use it because they trust our judgment.” — *Jon Vara*

LEED Certification False and Misleading, Lawsuit Claims

The green-building community has been rattled by a mid-October lawsuit filed in a New York federal court alleging that the U.S. Green Building Council (USGBC) “intended to mislead the consumer and monopolize the market for energy-efficient building design” by falsely claiming that it verifies energy-efficient design and construction through its Leadership in Energy & Environmental Design (LEED) rating system. The class-action suit — filed on behalf of “consumers, taxpayers, [and] building design and construction professionals” by New York mechanical-systems designer Henry Gifford — seeks \$100 million to compensate victims, plus legal fees. Although the case concerns commercial development such as office buildings, it raises the possibility that similar lawsuits could target green rating systems for residential construction.

Points for design. The LEED system, established in 2000, is a third-party certification program designed to

rate the “greenness” of qualifying buildings by awarding points for such design features as energy savings, water efficiency, indoor air quality, and reductions in CO₂ emissions. Depending on the number of points it earns, a building may be awarded one of four levels of certification, from “Certified” through “Silver” and “Gold” to the highest level, “Platinum.”

From its inception, the program has been criticized for focusing on a building’s design rather than its performance. A recent change requires building owners to report annual performance data — but there’s no way to repeal certification if a building falls short of its targets. Detractors say that the system is essentially a marketing tool that allows owners to charge premium rents to image-conscious tenants.

It’s not about energy. Gifford has clashed with the green-building establishment before. In early 2008, the USGBC claimed that LEED-certified buildings were

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25 to 30 percent more energy-efficient than other commercial buildings, based on a study it had commissioned from the New Buildings Institute (NBI), a nonprofit organization in Washington state. A short time later, Gifford published his own analysis of the data used in the NBI report; in it, he pointed out some statistically unsupported conclusions on the part of the USGBC. While admitting to some problems with its methodology, the organization continues to dispute Gifford's own conclusion — that LEED-certified buildings are actually 29 percent *less* energy efficient than comparable structures.

Gifford's lawsuit takes his earlier argument a step further. In essence, its claim is this: that while the USGBC is nominally in the business of evaluating the squishy concept of "sustainability," it has knowingly misled the public into believing that LEED-certified buildings are necessarily energy-efficient, when that is not the case. "What Henry is saying is that instead of hiring experts like him to improve building performance, building owners are just hiring a LEED consultant to do the paperwork to collect points for certification," says Stephen Del Percio, publisher of the *Green Real Estate Law Journal*. "There-

fore, he's been damaged, along with others like him."

A long way to go. Legal experts are divided on the suit's prospects. "This is really exciting from a dorky legal perspective," says Del Percio, "but it's only the beginning of a long process." Del Percio further observes that even though the suit appears to be a setback for the USGBC, it could ultimately work to its benefit. "They can say, 'Look, there were some problems in the past, but now we're better.' That may not help defend the lawsuit, but it could help them in terms of public awareness and raise their profile." — *J.V.*
