BY STEVE BACZEK

Rainscreen Basics

Water is the biggest enemy for home builders, and for good reason: Water is the number one killer of buildings. Therefore, proper water management is essential for a building's survival (see "A Primer on Water Management," Jun/17). The word "management" suggests that we respect the basic laws of physics and play along, rather than trying to defy those laws. In my conferences, I often say, "Mother Nature is a heartless adversary, with a perfect win streak. She may lose a battle or two, but she has never lost the war." Against those odds, the only road to successful building systems is proper water management.

Proper water management always comes down to a rate question. Things get wet, and then things dry out. The goal is making sure that the rate of drying exceeds the rate of wetting. To believe that you can stop things from getting wet is a very dangerous way to think. So, if proper water management says that the rate of drying needs to exceed the rate of wetting, then we need to develop our building assemblies to do just that—dry out.

Rainscreens and draining. Rainscreen principles have been around for a long time because they work. Properly installed rainscreens both reduce wetting and promote drying—a win-win situation for the wall assembly. So what is a rainscreen, anyway? It is simply a concept applied to wall assemblies where the cladding (siding) is separated from the underlying wall sheathing by an air space.

This air space functions in a couple of different ways. First, it is a drainage space **(1)**. Any water that makes its way into the wall assembly encounters this space, and because of gravity, the water falls. If a means of exit is provided at the bottom of the space, then the water drains away. Draining away any water that enters the wall assembly suggests that things inside will get less wet; in other words, the better a rainscreen is at draining water away, the more it reduces the wetting potential. Less water means less drying is required (remember, water management is a question of rate). The beauty of this part is that gravity is the mechanism for delivering success.

Drain and dry. A rainscreen is an air space between the cladding (siding) and the water-resistive barrier (WRB). In these examples, the rainscreen is created by attaching the cladding to furring strips fastened to the wall framing. The red arrows in the left-hand photo **(1)** show the direction water drains—down and out—through the space via gravity. Just as important, a rainscreen allows air to enter to dry out both the WRB surface and the reverse side of the cladding **(2)**.

Photos by Steve Baczek

Manufactured or site-built. The most common type of manufactured rainscreen is a mesh that attaches between the cladding and the WRB **(3)**. Vertical furring strips are a good way to create a rainscreen space **(4)**. Screening at the bottom of the space keeps out pests **(5)**. For vertical siding, furring strips can be mounted on the diagonal to allow for drainage **(6)**.

The drying factor. The second function of a rainscreen air space is to promote drying **(2)**. While I highly respect the draining capacity of a rainscreen, I believe that a rainscreen's function of promoting effective drying is probably more important. This is because the drying potential of the rainscreen space works on both sides of the space. In other words, the ventilated space can dry the cladding from the back as well as dry the wall frame assembly on the other side of the air space. Because of the added drying potential from a properly installed rainscreen, some building codes allow you to downgrade the vapor-retarding system if you incorporate a rainscreen into the wall assembly.

Stability and longevity. Finally, the air space of a rainscreen increases the level of stability for the cladding. Every type of cladding lasts longer when it experiences similar conditions on all sides. When one side of the board experiences different moisture conditions than the other side, those different conditions promote a level of instability that usually leads to undesired movement such as warping, twisting, and cupping. The air space on the reverse side of the cladding helps to maintain an equilibrium, which in turn increases the durability of the cladding's finish. The lifespan of a painted finish on cladding can be lengthened significantly when the challenge of moisture on the back of the cladding is greatly reduced.

Manufactured rainscreens. There are numerous materials on the market designed to provide a drainage and drying space between the cladding and the framed wall. One of the most common products is a plastic mesh blanket that attaches to the sheathing **(3)**. The cladding then installs over the mesh, which compresses, leaving the all-important air space between the cladding and the sheathing. Mesh systems such as Obdyke's CedarBreather work well for cedar shingles that require a lot of fasteners.

Many companies are making drainable housewrap products. Those products work in two ways by creating a water-resistive barrier (WRB) with a rainscreen on the outside surface. They have a

Closed vs. open rainscreen. Wood clapboards are an example of a closed rainscreen system, where each layer of cladding laps over the layer below **(7)**. All the ventilation in a closed system comes via the openings at the bottom of the rainscreen. In an open system, gaps between the siding boards allow increased ventilation to enhance drying **(8)**. Before rainscreen is installed, the building should be 100% airtight, weathertight, and water managed **(9)**.

raised texture with a bumpy pattern or some sort of three-dimensional surface to create the drainage space behind the cladding.

Site-built rainscreens. For the buildings I typically design, the simplest rainscreen is created with wood furring strips or strapping installed over the WRB **(4)**. The cladding then attaches to the furring strips (see "Installing Effective Rainscreens," Oct/18). An important detail with this site-built system is installing some sort of screen at the bottom of the air space that lets water drain away while keeping insects and rodents out **(5)**. In the case of vertically oriented siding such as board and batten, I have the builder orient the strapping diagonally to provide means of attachment while allowing for drainage and drying **(6)**.

Closed vs. open systems. For me, rainscreens come down to two basic types: closed systems and open systems. As the name suggests, with a closed system, the siding is installed with some type of closed lap joint, or simply installed as lap siding such as clapboards **(7)**. With a closed system, all the ventilation behind the siding comes from the openings at the bottom.

An open rainscreen system has spaces left between the installed planks **(8)**. While I have used both systems many times, my preference is for the open plank system. If ventilation is good, then more ventilation is even better. Both the open and closed systems rely on the same assumption: that the underlying sheathing and window installation are airtight, weathertight, and properly water-managed **(9)**. Before installing the rainscreen, you should solve for airtightness and water management 100%. Think of the rainscreen system and cladding as exterior "makeup," but makeup that drastically reduces the challenges and risks to the sealed building within.

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For a more detailed discussion of rainscreen basics, go to **www.jlconline.com/training-the-trades/rainscreen-basics**.