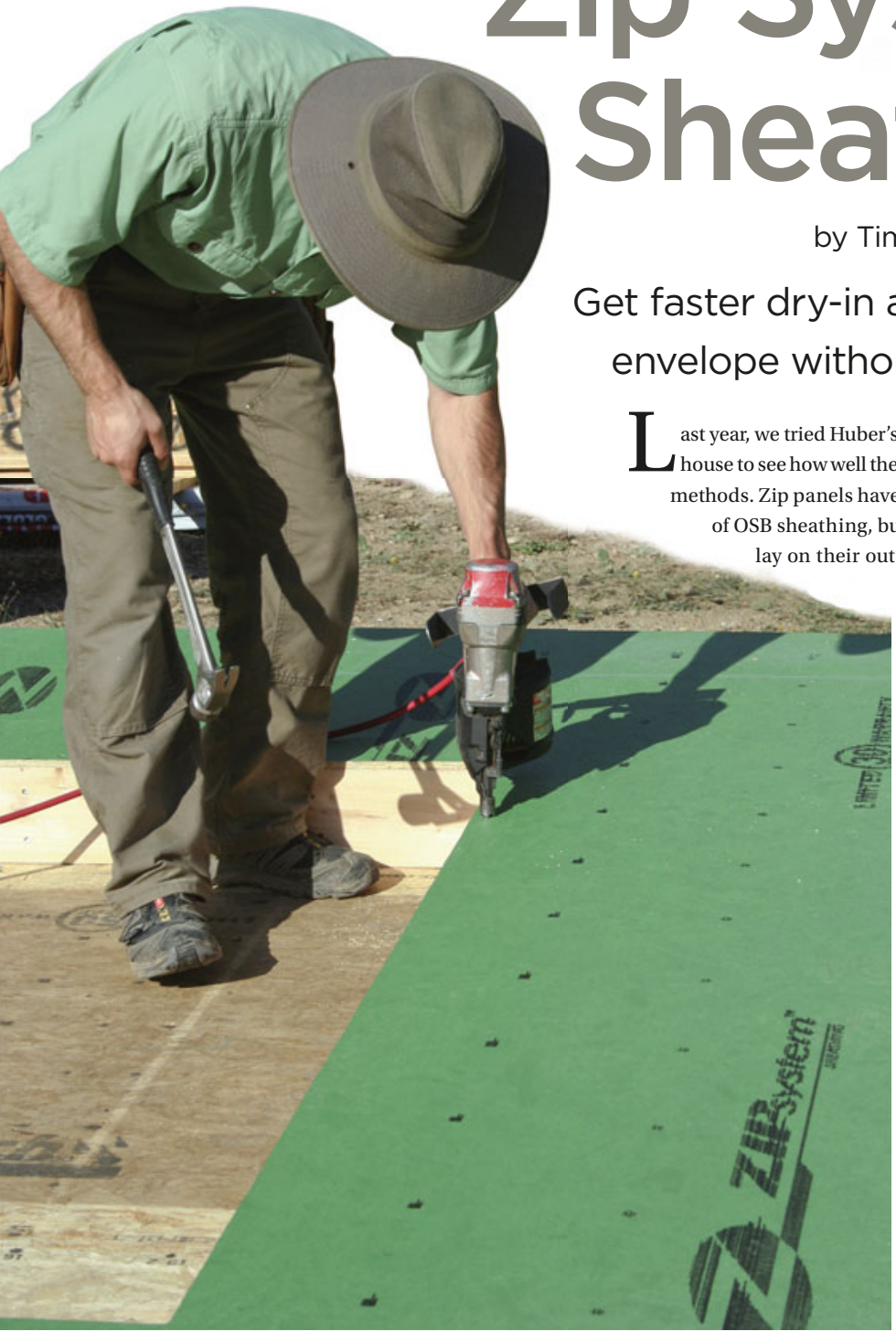
On Site With Zip System Sheathing

by Tim Uhler

Get faster dry-in and a tighter building envelope without housewrap



Last year, we tried Huber's Zip System wall and roof sheathing on a spec house to see how well these products would work with our construction methods. Zip panels have the same structural qualities as other types of OSB sheathing, but they also have a water-resistant kraft overlay on their outside face. After they're nailed off, the seams are sealed with a specially designed tape. Then the siding and roofing can be applied directly to the panel face, with no need for a separate water-resistive barrier or roofing underlayment.

A big incentive for me at the time was a $3-per-panel manufacturer's rebate that allowed us to test the Zip panels and tape without having to raise the price of the house we were building. That rebate was only for first-time users and has since expired, but we're still using Zip System sheathing. That's because despite the premium we pay for the sheathing and tape, we've found that — with a few exceptions — the installed cost compares favorably to that of conventional sheathing with housewrap.

There are numerous benefits to using Zip sheathing, including faster dry-in and less wind damage to the weather barrier before siding and roofing application. But possibly the biggest advantage is that the taped panels create a continuous air barrier, making it easier to build a tight shell

and meet the 2009 International Energy Conservation Code's requirements for air leakage. Under the newest version of the energy code, air leakage needs to be less than seven air changes per hour at a pressure of 50 pascals (ACH50) as tested with a blower door. (Washington State, where I work, has recently adopted a similar code.) If you're committed to building energy-efficient houses or you work in an area that has adopted the IECC, using Zip sheathing might simplify how you detail the building envelope.

Cutting and Installation

We work in an earthquake zone and typically run our sheathing vertically to reduce the need to block panel edges. So we appreciate the fact that the long edges of the wall panels have a self-spacing profile that allows us to butt the panels tightly together at this critical joint (**see Figure 1, next page**). Along the shorter 4-foot panel edges, a standard ⅛-inch gap is still required.

Nailing. Zip sheathing feels a bit stiffer and denser than standard OSB sheathing. Even so, when we first nailed off the Zip panels, it seemed that we were overdriving an unusual number of fasteners. According to Huber, overdriving doesn't compromise the panels' water resistance or void the warranty, but the company recommends taping any fastener driven more than ⅛ inch below the surface of the substrate. When we slowed our pace a little instead of blasting away with our nail guns, we had better success setting the nail heads flush. This simple step didn't cost us much extra time, and we didn't have to reset the depth-of-drive on our guns or lower our compressor settings.

Even when the nail heads are perfectly flush during installation, though, we've noticed that when we come back later to install siding, the nails all look slightly overdriven. My guess is that the sheathing absorbs a little of the moisture in the air and swells, so on our next house we plan to try using Bostitch HurriQuake nails (800/556-6696, bostitch.com). These nails have a 25 percent larger head and a smaller .113-inch shaft diameter (as opposed to the .131-inch-diameter fasteners we're using now), which I think will

About Zip System Sheathing

Zip System sheathing combines OSB structural panels with a layer of resin-impregnated kraft paper. The .01-inch-thick overlay is permanently bonded to the outside face of the panels in the press as the OSB is manufactured. The panels are manufactured for use as wall and roof sheathing; the roof sheathing panels have a gritty surface texture to improve traction. Roof panels come in ½-inch and ⅝-inch thicknesses in a standard 4x8 size; wall panels come in 7/16-inch and ½-inch thicknesses, in sheet sizes from 4x8 to 4x12, according to literature published at the manufacturer's websites (huberwood.com, zipsystem.com). Wall panels are available either square-edged or with a self-spacing machine-edged profile; roof panels can be tongue-and-groove, square-edged, or machine-edged.

ZIP wall and roof panels consist of OSB structural sheathing with a water-resistant, resin-impregnated kraft facing.

Getting rid of housewrap? The ICC evaluation report for Zip System wall sheathing states that it is "used as combination wall sheathing, air barrier, and water-resistive barrier" — no doubt a big reason for its increasing popularity in some parts of the country. While housewrap can be installed quickly by anyone, it's rarer to see it installed well, and not uncommon to see it torn and flapping in the breeze — which would be impossible with a bonded WRB. Of course, the "system" requires the application of tape, which is time-consuming and expensive. But for builders looking for an airtight shell, the tape is just another part of the attraction. And though housewrap may be omitted, some builders using Zip wall panels include it anyway, because they are reluctant to rely on taped joints to permanently keep out water and because they want the additional water-resistant layer for weaving in cap flashings over windows and doors (see "High-Performance Homes on a Budget," 01/11).

Huber claims a vapor permeance of 12 to 16 perms for the overlay on the Zip wall panels. That means a wall sheathed with Zip panels will have a vapor profile similar to that of a wall sheathed with conventional OSB and covered with Typar, which has a permeance of around 12 (by comparison, Tyvek is 58 perms). — *The Editors*

help keep the nail heads flush with the face of the sheathing.

Cutting. The denser panel material definitely takes a toll on blades and bits, at least compared with standard OSB. We noticed when we were cutting ½-inch roof sheathing that the red coating quickly disappeared from the Freud Diablo blades we like to use. Since we never experienced this when cutting AdvanTech subflooring — another Huber OSB sheathing made with the same resins but without the overlay — we assumed that the wear on the blades was caused by the overlay. Most of the roofs we frame have lots of hips and valleys, and with the Zip System panels, the many cuts required were not as clean as we were used to.

We try to keep cutting to a minimum when sheathing walls by running the panels over door and window openings, then coming back later with a router to cut out the openings. On our first Zip house, our carbide router bits lasted about half as long as they last on houses with regular OSB sheathing.

Taping the Seams

We sheathe walls while they are on the ground whenever possible, which means that we usually tape the seams at the same time. To keep the framing process moving along, we've learned to nail off the seams first, then have one crew member tape them while the rest of the crew finishes nailing off the rest of the panels. Because the panels are stamped with stud locations and nail spacing, we have fewer missed nails. And when the time comes to install siding, it's easier to hit the framing.

Some building inspectors like to have a look at the nailing before the house is wrapped, which obviously complicates matters a bit when using the Zip System. Fortunately, the tape is thin enough that an inspector can see or feel the nail spacing to determine whether the fasteners are overdriven. Some inspectors are a little stricter and want to actually see the bare nails, in

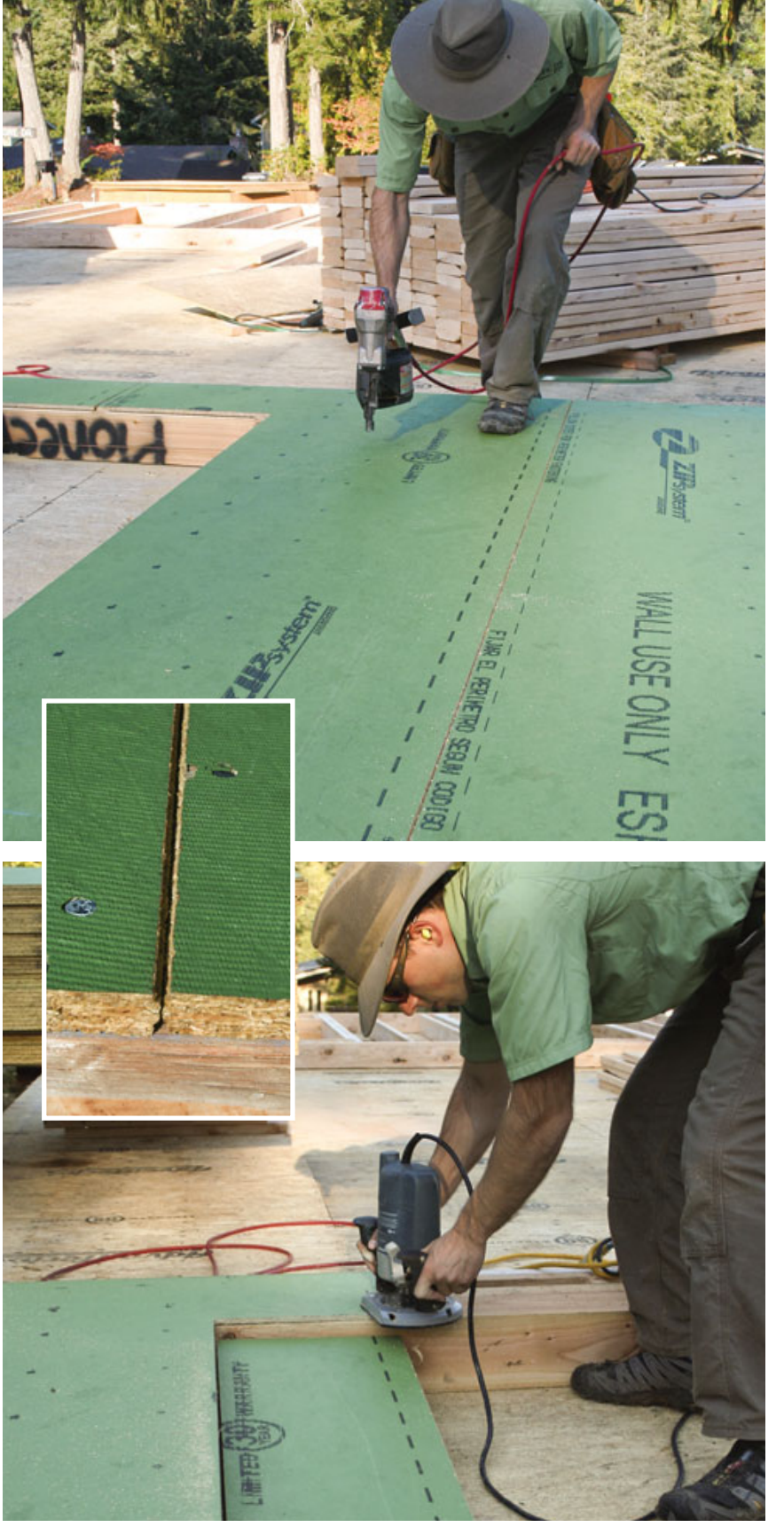
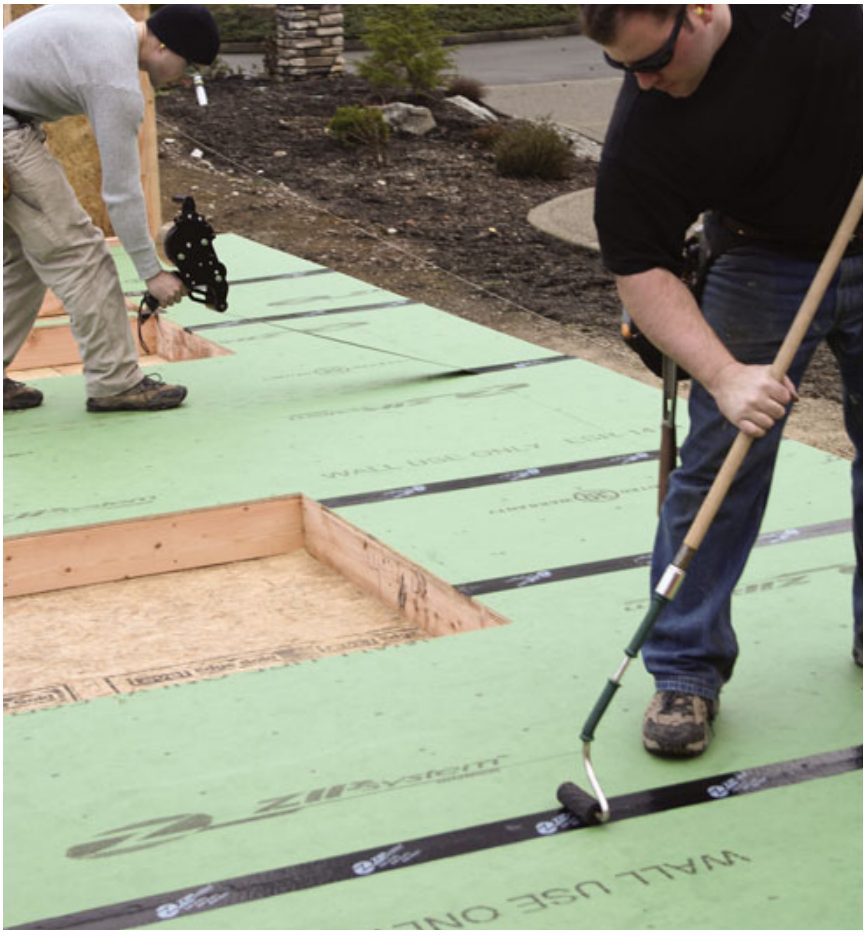
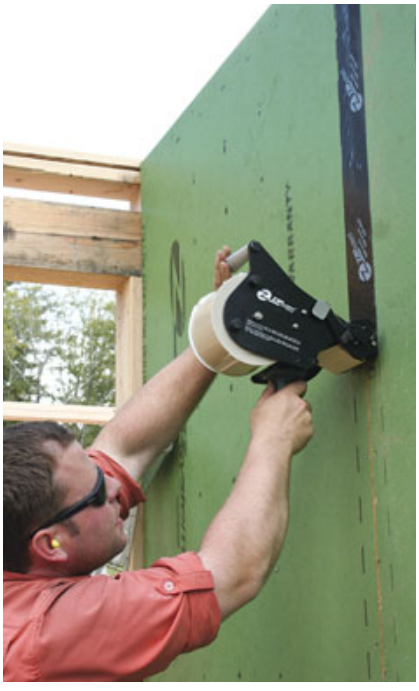


Figure 1. Zip wall panels are premarked for 16-inch and 24-inch on-center stud layouts and have a self-spacing profile along their long edges (top and inset). The author uses a router to cut out door and window openings (above); he's found that router bits tend to wear faster when cutting Zip panels than they do when cutting standard OSB sheathing, probably because of the denser material and resin-impregnated overlay.





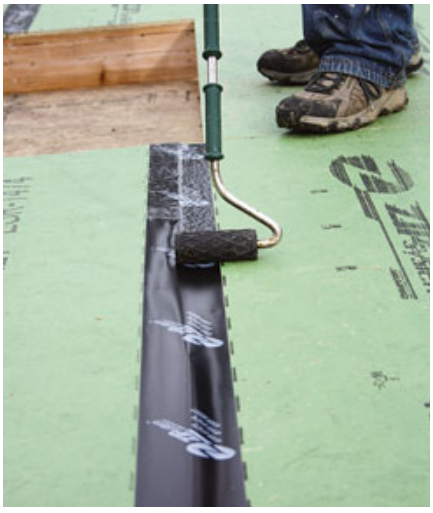


Figure 2. The author's crew uses the panel manufacturer's guns to tape seams (left). The tape gun has a built-in roller, but the crew also uses a J-roller to make sure the tape is firmly applied (top and above).

which case we can leave the tape off the corners and a few seams, then apply the tape after the walls are raised.

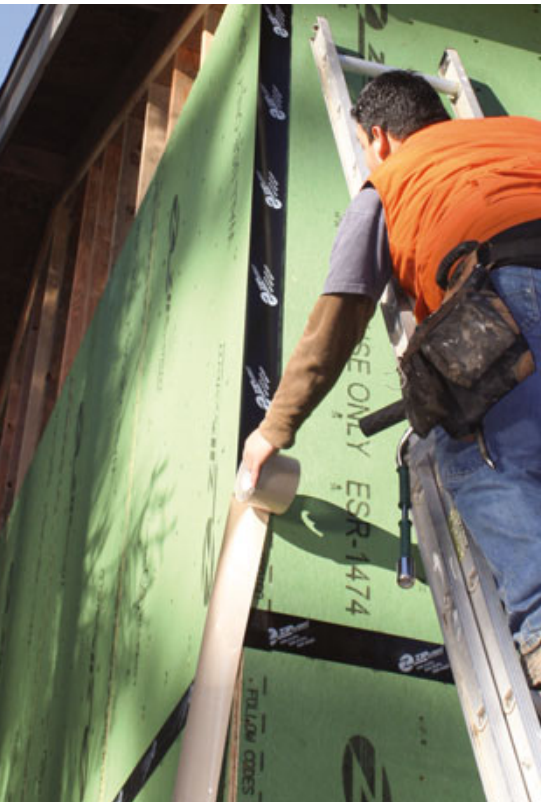
Tape sizes. Zip tape comes in 3¾-inch and 6-inch widths and consists of a polyolefin film with an acrylic adhesive. It's thinner and less gummy than butyl- and asphalt-based tapes and can be repositioned during installation. According to Huber, the tape can be applied to surfaces as cold as 20°F as long as they're dry to the touch and frost-free. The manufacturer warrants that taped and installed Zip panels can be left exposed to the weather and UV rays for up to 120 days.

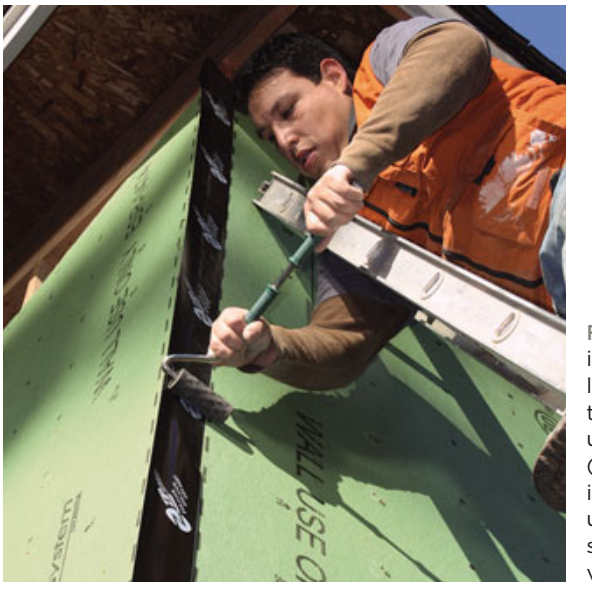
Application. The fastest way to apply Zip system tape is with Huber's stout new tape gun, which resembles the dispensers used to tape boxes together (**Figure 2**). The gun's built-in roller makes it easy to apply enough pressure to activate the tape and smooth out air bubbles or wrinkles. The gun also has a spool that automatically rolls up the release paper on the tape. It takes a crew member only about 10 minutes to tape a 32-foot-by-16-foot wall.

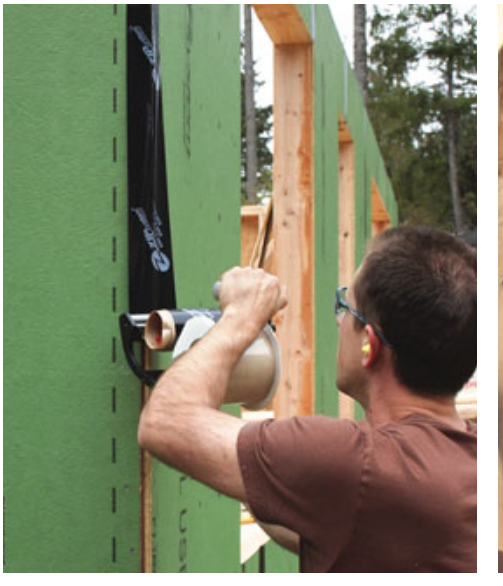
Keeping the tape straight on runs more than 5 feet long can be tricky, though. So for longer seams, we tack the tape down at one end, pull an 8- to 10-foot length off the gun so that the tape is straight, and then lay down the tape so that it's centered over the seam. If there are any splices, we overlap the tape at the joint by a couple of inches. After taping, we use the Zip System's J-roller to smooth out any wrinkles and activate the tape.

Zip tape can also be applied manually. After pulling lengths of tape off the roll and cutting them to length, we pull off the release paper as we're taping the seam, then go back over the seam with the J-roller. This method takes a lot of time, so we use it mainly for inside corners and other odd configurations (**Figure 3, next page**).

In rainy conditions, we keep the panels covered by a tarp so they stay dry. That way, we're always sheathing with dry panels, regardless of the previous night's conditions.







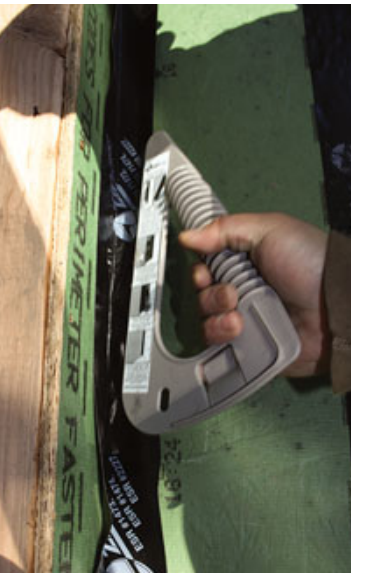


Figure 3. Corners are typically taped by hand (far left and left), though the tape gun is sometimes used for outside corners (below left). A corner tool included in the gun kit is useful for applying pressure to inside corners and valleys (below).

If it's raining while we're sheathing, we don't tape the seams immediately; instead, we return later and "blow-dry" the seams with a backpack blower (**Figure 4**). One person walks down the seam blowing off the water, and another person follows with the tape. If it's impossible to keep the sheathing dry enough, we wait until conditions improve and the surface has dried off before coming back to tape.

Windows and Doors

For window and door installations, we use the same basic flashing techniques with Zip sheathing that we use for walls wrapped with housewrap. The one big difference is that we're ultimately relying on the adhesive bond between the tape and the sheathing to keep water out of the wall. First, we cover the rough sill with 6-inch Zip tape or less-expensive 9-inch Vycor or Moistop, lapping the flashing out and over the sheathing (**Figure 5, next page**). At the bottom corners of the opening, we use either a flexible flashing tape or Vycorner prefabricated self-adhering corners (866/333-3726, graceconstruction.com). Then we caulk the back of the unit's nailing fins with a flexible

Figure 4. Zip tape can't be installed on wet surfaces, so a backpack leaf blower is used to dry off the seams in damp conditions.

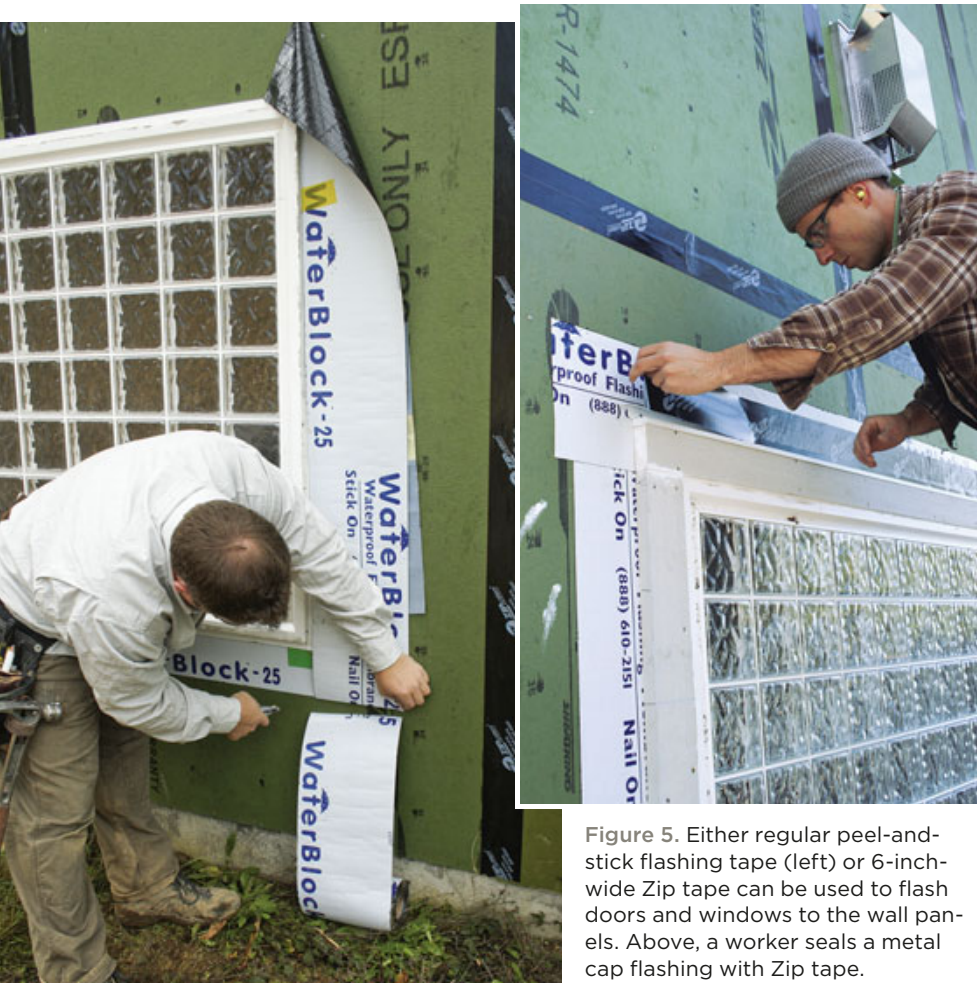


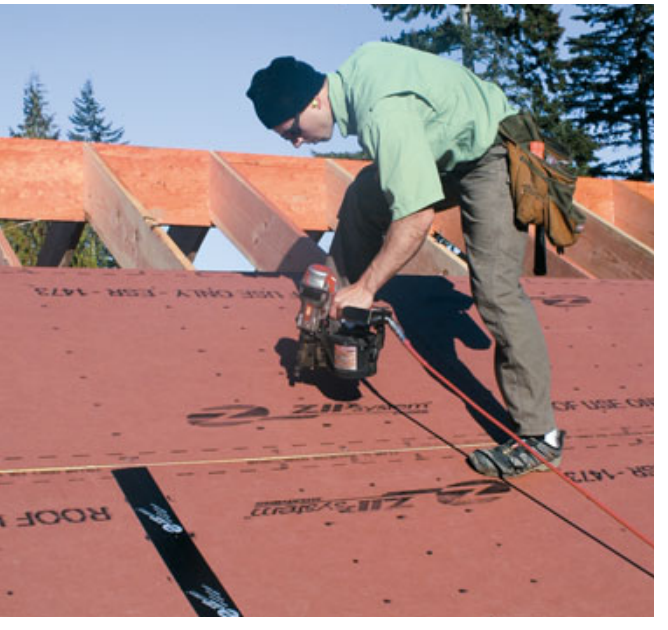
Figure 5. Either regular peel-and-stick flashing tape (left) or 6-inch-wide Zip tape can be used to flash doors and windows to the wall panels. Above, a worker seals a metal cap flashing with Zip tape.

adhesive and set the window into the opening. Next, we flash the fins to the sheathing, making sure to firmly J-roll the flashing tape to the wall and nail fins. Finally, we install the head flashing over the trim at the top of the window, taping the Z-metal to the wall with Zip tape.

Huber's 6-inch-wide Zip tape costs a little more than the 9-inch-wide butyl- and asphalt-based peel-and-stick flashing tapes we typically use, but I think it's a far better product. We've left windows and doors flashed with Zip tape for over a month without a single corner or edge peeling off the sheathing (a problem we've had with many other peel-and-stick tapes). Unfortunately, Zip tape is approved as a flashing tape only with Zip sheathing and might be red-tagged by your inspector on regular OSB or plywood.

Roof Panels

Normally, we frame roofs 24 inches on-center with 7/16-inch roof sheathing, so we have to use H-clips. But the Zip roof panels we use are true ½-inch OSB with a 32/16 span rating and they don't require edge support. This simplifies installation somewhat but presents a potential problem:



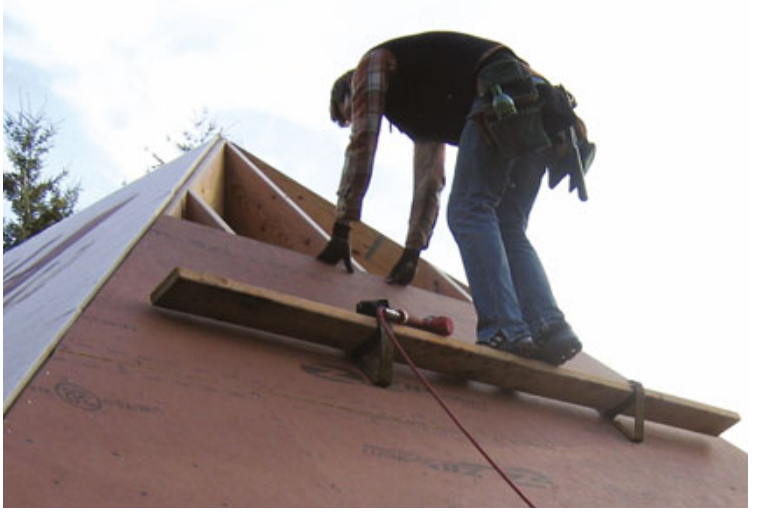


Figure 6. Zip roof panels provide good traction (left), thanks to grit added to the overlay during production. The author's crew sets up toeboards for roof pitches steeper than 8/12 (above).

Since the long edges are self-spacing, the spacer lips on the sheathing can sometimes overlap, lifting the edge of the uphill sheet slightly. To avoid this problem, we begin nailing along the bottom of the sheathing at each rafter to pull the sheathing tight to the framing before nailing off the rest of the sheathing.

In dry weather, Zip roof panels provide plenty of traction, thanks to the grit in the overlay (**Figure 6, previous page**). The panels are slicker in wet weather, but not noticeably more so than regular OSB or plywood sheathing. In most conditions, we can comfortably frame up to about an 8/12 roof without using toeboards.

Taping. On roof pitches less than 8/12, taping roof seams is a very quick process (**Figure 7**). For example, it takes about 15 minutes to tape and J-roll a 20-foot-by-30-foot section of 7/12 roof.

On roofs steep enough to require toeboards, however, I think that the benefits of Zip sheathing are outweighed by the extra labor required to tape the seams. On a recent 12/12-pitch roof, for instance, we needed more toeboards to get leverage on the tape gun and J-roller than we needed to actually sheathe the roof. And, of course, all of the nail holes from the toeboards have to be taped. In fact, it probably takes twice as much labor to sheathe and tape a steep Zip System roof as it does to sheathe the roof conventionally and roll out underlayment. So in the future we'll stick to OSB sheathing for steep roofs.

Underlayment. Manufacturers and local codes may require an additional underlayment for shallow-pitched roofs, depending on the roofing material. There is a two-layer underlayment requirement in most building codes for roof slopes between 2/12 and 4/12, and a taped Zip roof replaces the first layer only. Also, when it comes time to strip off the old shingles and reroof, new underlayment will be required over the Zip sheathing regardless of the roof pitch.

Eaves, valleys, hips, and ridges. The wider 6-inch Zip tape is ideal for valleys, though Huber says that overlapping the 3¾-inch-wide tape by at least 1 inch is okay, too. In some areas, code may require an additional self-adhering valley flashing. Hips and ridges are also taped, and we tape step flashings to sidewalls where necessary **(Figure 8, next page)**.

At the eaves, ice barrier membranes may be required in certain climates. They're not required in our coastal climate, but my roofer tells me that they would be if we were building farther up in the mountains. Huber allows any self-adhering ice barrier with an ICC-ES report (or equivalent) to be used over the Zip sheathing.

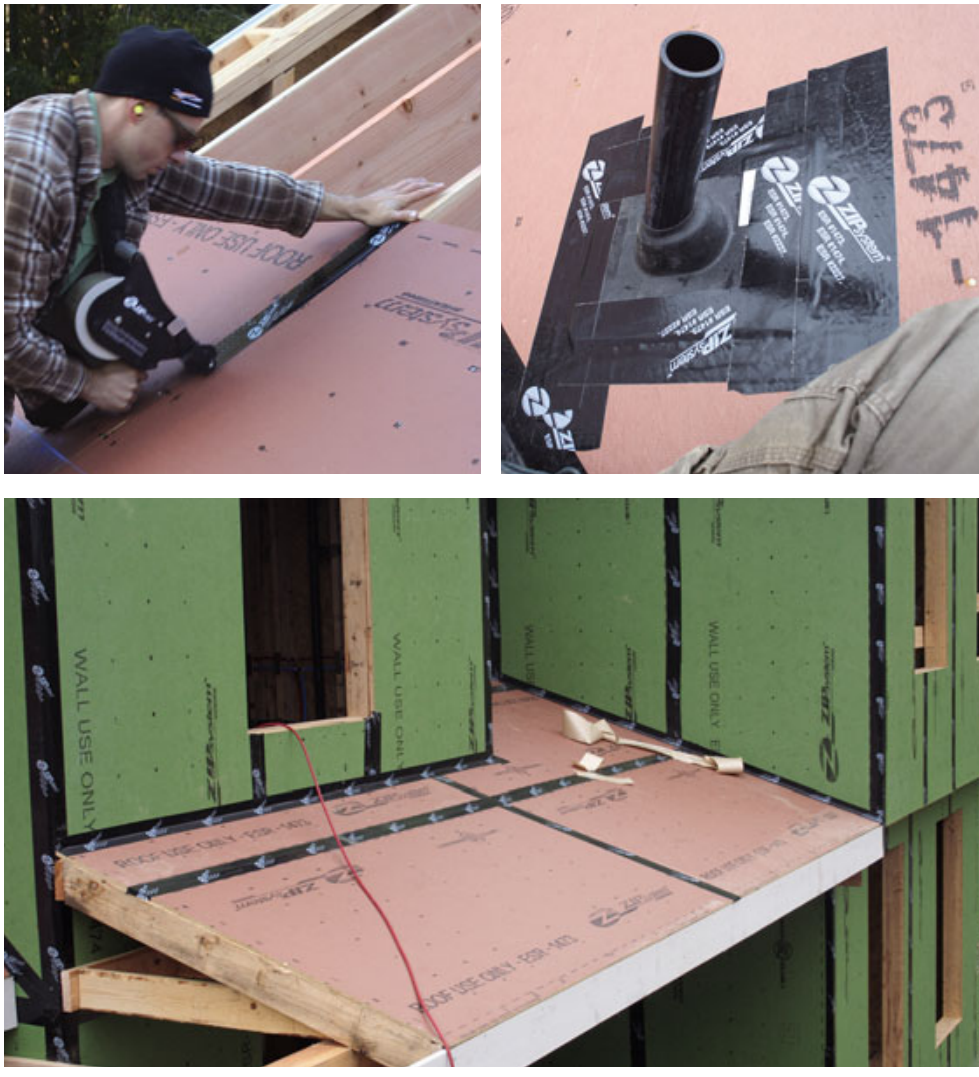
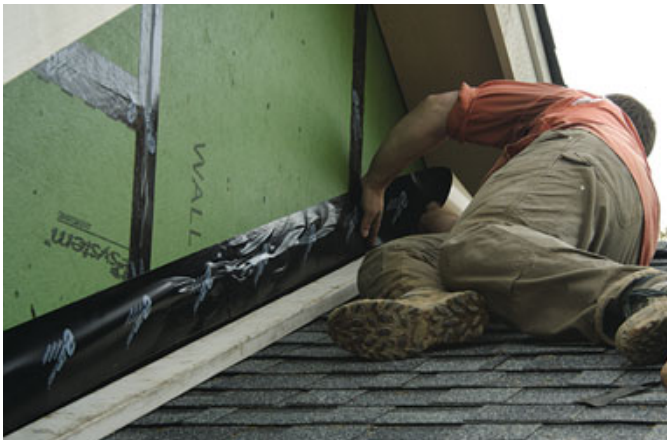


Figure 7. On shallow pitches, seams can be quickly taped as the roof is sheathed (top left). Roof penetrations (top right) and roof-to-wall intersections (above) are also sealed with tape — which is guaranteed to remain watertight for up to 120 days — before being covered.

Cost

In my area, Zip System sheathing tends to cost about twice as much as comparable OSB sheathing. Currently, we're paying $7.67 per sheet for OSB sheathing and $14.63 per sheet for Zip wall panels. Zip roof panels are twice as expensive as both AdvanTech and Edge Gold roof sheathing.



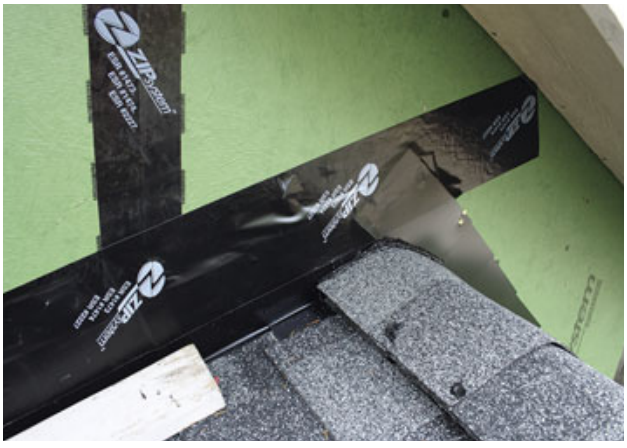


Figure 8. After the step flashing and roofing have been installed, the author tapes flashing to the sidewalls with 6-inch tape (above photos). When all the panel joints have been taped, the shell is weathertight and ready for roofing and siding (left).

After several houses, we've learned that the installed cost for Zip wall sheathing — including the labor to install the tape but not the cost of the tape itself — is roughly equal to the installed cost of OSB plus Tyvek. The extra cost, then, is in the tape.

About one box of tape (a box contains 12 rolls, at 90 lineal feet per roll) is needed to seal a unit (70 to 80 pieces) of 4x8 Zip panels; for a typical 100-sheet house, that's 16 rolls of tape. In addition, we use two or three rolls of Zip tape for flashing windows and doors and taping step flashing and Z-metal to the wall. Tape costs around $28 per roll, so using Zip panels adds about $500 to the cost of a 3,000-square-foot house.

We're not convinced that Zip roof sheathing is cost-effective (particularly on steep roofs), since our roofing sub can roll out underlayment and cover the roof completely the same day he starts shingling. If we were trying to build tighter homes in an area that had a colder climate and a stricter energy code, though, the added cost might make more economic sense.

But with or without the energy savings, we're sold on Zip wall sheathing. We can tape the walls while we're framing and rigging them to be lifted into place, so we don't lose any time; and we avoid the ladder work that would be needed to hang housewrap. In fact, we eliminate about a day in the construction cycle that would typically be spent installing housewrap, detailing it correctly, and then — later — fixing rips in it caused by wind or by other tradesmen stubbing pipes or wires out through the walls.

Also, since we protect the seams with tape as we frame, the panels don't absorb moisture. This saves both time and money, since in our climate we might sometimes spend as much as $1,000 to run kerosene heaters and dehumidifiers to dry out an OSB-sheathed house before insulation.

***Tim Uhler** is a builder in Port Orchard, Wash.*