Low-Slope Reroof with EPDM

This self-adhesive rubber membrane goes down easily, and provides long-term protection for low-slope roofs

by Rick Stacy

While weighing the options for replacing a small, low-slope, porch hip roof, I quickly rejected half-lap, mineral-surfaced roll roofing. It would have to be redone or coated in eight to ten years, if not sooner. A bituminous underlayment, such as Grace Ice & Water Shield, under standard three-tab asphalt shingles would work, but only on slopes 2:12 and steeper. There's always torch-down, but I don't do a lot of it, and I don't own a torch. I didn't want the rental expense, not to mention the risk of using an open flame on a combustible roof surface. I was tempted to go with a top-of-the-line flat roof product and sub the job out to a certified EPDM rubber membrane installer. But I didn't need the scheduling hassles, and there probably wouldn't be much money left in the end for my trouble and headache.

What I needed was a durable, easy-to-install membrane that I could handle myself, preferably one that didn't involve buckets of the tenacious black stuff that has a way of getting on everything, including your tools, hands, and the finished roof surface.

Advantages of EPDM

A little research turned up WeatherBond 110 (WeatherBond Pro, P.O. Box 2022, Mechanicsburg, PA 17055; 800/575-4406), a 45-mil, black EPDM rubber roofing membrane backed with 20-mil butyl adhesive. Designed for smaller roofing jobs, it comes in 4x25-foot rolls that cover one square each. It has a peel-and-stick release liner, slit lengthwise at 4 and 24 inches from one edge to facilitate installation.

Single-ply EPDM rubber roofing has many advantages over other roofing options. It remains flexible at extreme temperatures, can be installed quickly, and resists deterioration from exposure to ultraviolet radiation — a protective coating, like natural stone, is not required as with some torch-down products.

Expensive option. The rubber membrane is expensive. The cost, including the EPDM roll, cover strip, primer glue, and sealant is about $160 per square. And you need to figure in some extra for corner covers and pipe boots. But the installation cost fares pretty well compared to a torch-down product, considering the labor and expense of installing a UV coating over the torch-down. The WeatherBond 110 membrane is also available in solid white rubber, but it costs about 16 percent more than the black rubber. White reflects most of the sun's infrared rays, which helps to keep the roof and the space below cool in warmer climates. Currently, the same black cover strips must be used with the white rubber membrane. It's possible to paint the black cover strips, using acrylic latex or oil-based paint but successive coats of paint may be necessary to prevent bleed-through. However, the company plans to have a white cover strip available this fall.

Warranty. The 12-year WeatherBond warranty is, to date, the best I've found in the category of residential low-slope roofing products. And, if the performance of single-ply EPDM roofing on commercial installations is any measure, WeatherBond 110 can certainly last much longer than 12 years, if it's properly installed. Granted, the product was

Figure 1. Weatherbond 110 self-adhering EPDM must be installed over a clean, paint-primed substrate. The author paints OSB sheathing prior to installation in order to speed the membrane installation. To protect the membrane from wear over sharp corners, he installs a 6-inch-wide strip of the membrane over the transitions first.

HELPFUL HINTS

- To minimize wrinkling and movement of the installed membrane during installation, lay down strips of plywood to walk on.
- In cooler temperatures, the tack of the adhesive decreases. Store the material in a warm place prior to installation.
- Use chemical-resistant gloves to protect skin when applying primer.
- Overlaps of the membrane should be a minimum of 4 inches.
- WeatherBond 110 cuts best with a utility knife from the top side.

Hot-Weather Considerations

- Use white primer for the roof surface to reduce the temperature of the roof deck.
- Keep the membrane in the shade until needed.
- Install the membrane early in the day when the sun is low on the horizon.
- Use shorter lengths of membrane to limit exposure and setup time.
- Liner is more difficult to remove in hot weather. Remove it with abrupt tugs and hold the membrane firmly to prevent adhesive from contacting itself.

Figure 2. The starter course overhangs the roof edge by about 1 1/2 inches. A push broom is the ideal tool to embed and smooth the membrane into place as the protective paper facing is peeled away.

Figure 3. A standard 2 1/2-inch-wide aluminum drip edge is installed over the membrane to provide a clean-looking perimeter and direct water into the gutter. An EPDM cover strip will be applied later to seal the material transition.

a little hard to find for this job. It was available at only one roofing supplier in my area. WeatherBond's area rep assured me that the company is encouraging lumber retailers to stock their product, so its availability may improve.

Temperature range. WeatherBond 110 is best installed at temperatures ranging between 40°F and 80°F. However, there is some latitude. If it's 35°F, but it's sunny on the deck, the material may be workable enough. The same holds true if it's 85°F but cloudy. The glue on the product gets very aggressive in high temperatures, and special techniques must be used to install it (see "Helpful Hints"). The manufacturer provides an installation video and instruction booklet, on request, that clearly illustrate these and other procedures.

WeatherBond membranes are not compatible with uncured petroleum-based materials, such as fibered aluminum roof coatings. However, WeatherBond can be installed over cured petroleum products, such as a fibered-aluminum-coated trailer roof.

If I were doing a roof that was any larger than this one — which was 12x26 feet — I would seriously consider using another product, WeatherBond 101, to eliminate a couple of the time-consuming aspects of the job. WeatherBond 101 is a 60-mil EPDM material that comes in 10x20-foot sheets. The sheets are shipped folded in a box, rather than in rolls. The 101 is a standard glue-down rubber membrane and has no self-adhesive backing.

Roof Prep

WeatherBond 110 will adhere to a variety of surfaces, including wood, metal, plastic, glass, fiberglass, rubber, masonry, smooth-surfaced built-up roofs, and nongranular roll roofing. For this reroof, I wanted to start with a good, clean substrate, so I stripped the old asphalt roofing down to the roof boards — being careful to clean and preserve the existing wall and chimney flashing — and installed a layer of 1/2-inch OSB, which I had coated with a good latex paint primer the day before

installation. The primer is recommended for better adhesion of the WeatherBond butyl-adhesive backing to the wood. I primed the sheets ahead of time so that I could strip and protect the roof the same day.

After checking the surface for any protruding fasteners, I cut 6-inch strips of the roofing material from the 4-foot roll and installed them over the rough edges of the plywood hip to cushion the membrane against premature wear (see Figure 1, page 2). I figured this might be one of the first areas to develop a problem.

The starter course is partially rolled out for alignment, overhanging the edge of the roof by about $1\frac{1}{2}$ inches. I made a pencil mark on the deck where the center slit in the release liner falls, marked that same measurement up from the edge at the opposite end of the roof, and snapped a guideline for the rollout. Aligning the center slit with the guideline, we rolled out the roofing, simultaneously peeling back the 20-inch-wide liner strip, leaving the 4-inch liner temporarily in place at the bottom edge. After securing the lower half of the roll to the roof, we slid the upper release liner out from the top and smoothed the wrinkles out of the membrane with a push broom (Figure 2, previous page).

At the overhang, we pulled off the 4-inch release strip and wrapped the membrane over the edge, nailing it to the fascia every 6 inches. I folded the outside corners over and nailed them.

Main course. We followed the same sequence to install successive rows of roofing: Snap a guideline at the center release mark, remove the lower release liner, broom the membrane into place, then slide the upper release liner out, leaving the 4-inch-wide release liner at the overlaps temporarily in place.

For economy of motion, I chose to install the membrane horizontally, rolling it directly from one end of the roof to the other, despite the fact that once it passed over the hip, the membrane ran parallel to the watershed off the roof. Either orientation seemed okay to me, as the overlaps would all be glued and sealed. Arguably, the vertical

Figure 4. Splices in a course must be prepared with a proprietary primer before joining with a minimum 4-inch overlap. Peeling back a short length of the separate 4-inch-wide parting strip along the bottom edge allows full-width bonding of the splice.

Figure 5. With all of the courses installed, the author goes back and prepares the overlaps with primer before peeling off the 4-inch-wide protective strip and bonding the edge. A vigorous follow-up treatment with a wood or steel seam roller assures a good seal without bubbles or blisters.

Figure 6. The membrane should self-flash as high up an abutting wall as possible. In this case, existing metal flashing at the chimney and sidewall restricted the vertical return. The author used a putty knife to coax the membrane into place under the metal (top). The membrane folds into inside corners; outside corners are slit to make the transition, then reinforced with a small patch of roofing material bonded over a primed surface (above).

direction has an advantage, in that water shedding off the roof won't puddle behind any horizontal laps. We applied a stock aluminum drip edge around the roof edge for aesthetics and to direct runoff into the gutter (Figure 3, page 3).

Sealing overlaps. When a roll ends short of the end of the roof, an overlapping seam of at least 4 inches is required. Before bonding the seam, you have to apply proprietary adhesive primer to the overlap area, using a clean cotton rag, and allow it to dry completely, which takes 5 to 15 minutes. It's a good idea to outline the overlap area with a pencil first to guide the primer application. After the primer dries, remove the release liner and fold the lap over into place (Figure 4), removing just enough of the 4-inch release strip at the bottom edge to allow full-width adhesion of the lap joint. To ensure a solid bond and remove any air bubbles, all laps must be thoroughly worked with a hand roller across the joint, end to end. The best tool for the job is a heavy-duty, steel hand roller.

Of course, the overlaps between courses have to be bonded together. Where the upper layer of roofing laps the lower, trace the overlap area with a pencil, apply primer, let it dry and press the lap into place, while progressively pulling the 4-inch-wide release liner away (Figure 5). When a course overlaps a splice in the course below it, I apply a bead of WeatherBond sealant to the edge of the splice and bed the upper lap into the uncured sealant.

Wall Flashing and Corner Treatments

At roof-to-sidewall intersections, the manufacturer recommends lapping the membrane as high up the wall as possible. I was somewhat restricted in this aspect because of the tight space under the existing flashing and siding. I slit the vertical membrane to fold it around the outside wall corners and used a putty knife to tuck it as high as I could behind the wall flashing and the flashing of the stone chimney penetrating the roof (Figure 6). I wrapped a reinforcing patch of rubber around the outside

corner of the chimney to provide a base for the proprietary corner seals, to be applied next.

Sealing corners. To seal corners and penetrations, the system uses more pliable, semi-cured EPDM. The round-cornered, rectangular corner seal is readily stretched and worked into transitional contours. Corner seals come with release strips on both sides: blue poly on the outside face and paper on the adhesive side. The poly cuts friction, making the rubber easier to smooth onto the surface.

Outside corners. To apply an outside corner cover, first you fold it in half and remove one half of the release paper. Once the sticky half is folded around the wall corner and pressed into place, you remove the rest of the release paper and, working from the corner out, press the cover into contact with the roof surface. You finish up with the roller and apply a bead of WeatherBond sealant to all edges of the corner seal (Figure 7).

Inside corners are a little trickier. First, you remove and replace the blue poly (which makes it easier to remove later). Fold the corner cover along the slit in the release paper and remove half the paper. Then fold the corner again into quarters, sticky side out, and fit the package tightly into the corner, bonding to the roof. Then work the corner up one side of the wall, remove the rest of the paper, and work the corner onto the roof and the other wall (Figure 8). Some extra material results, which you fold back onto itself against the wall. Follow up with the roller and an application of WeatherBond sealant on all the exposed edges. It sounds harder than it is, but the available installation video shows all the details.

Figure 7. A proprietary corner cover, made of a more pliable EPDM rubber, can be readily stretched and formed to protect inside and outside corner transitions from roof to wall (top). As with all rubber-to-rubber bonds, it's necessary to prime the surface of the bonding area first. All cover edges receive a continuous bead of system sealant, feathered while wet to knock down the ridges (above).

Cover Strips and Sealant

With all of the rolls bonded to the roof deck and all the overlaps glued, things look pretty well protected. However, for the system to be covered under warranty, proprietary cover strips must be applied to every last lap in the membrane (the roof must also have a minimum 1/2-inch slope per foot). All edges of the cover strip must also be

Figure 8. An outside corner is fairly simple to install; trickier inside corners follow a prescribed sequence of folds to install properly. Leftover material is folded onto itself and all edges are caulked with proprietary sealant.

Figure 9. Perimeter drip edge and all membrane seams are covered with a cover strip, made of the same pliable material as the corner seal (above). Sealant, applied to all exposed edges of the cover strip, completes the job (right).

treated with WeatherBond sealant.

The 6-inch-wide cover strip is made of the same pliable material as the corner seals and is easily worked into indentations and irregularities in the roof surface and overlaps. After outlining and priming for the strips, I rolled out the cover, simultaneously pulling back the clear poly release liner, and gave the strip a vigorous roller treatment (Figure 9). I left the bottom 1/4 inch of the aluminum drip edge uncovered to allow for an application of sealant to the cover edge later, to prevent water from backing up under the membrane. Working from the bottom of the roof to the top helps to keep overlaps in the proper sequence. You can snap a line to follow, but I just kept the cover strips centered on the overlap by eye with good results. Overlap splices in the cover strip by at least a couple of inches.

To seal the old continuous aluminum wall flashing to the roof membrane, I first applied a heavy bead of the proprietary sealant, following under the long edge. I bedded the flashing in the sealant and nailed the edge to prevent it from lifting. There was some residual tar on the flashing, the worst of which I had already scraped off, but the cover strip will adhere to hardened tar. I prepped the flashing with primer and installed a cover strip over it, rolling it firmly into place. At the chimney, I applied a liberal bead of sealant behind the flashing, then pressed and shaped the existing lead flashing back into it. To finish the job, I caulked all edges and overlaps of the cover strip with WeatherBond sealant. While the sealant was still wet, I feathered it out, using a scrap of the membrane.

With EPDM in my bag of tricks, you won't catch me mopping tar on a half-lap roll again, or fighting the losing battle of trying to keep the sticky black stuff off my hands, hammer, and light-colored roof surface.

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