



Decking Over a Roof

Detail the roof correctly, and the decking part of the job is easy



EPDM membrane

Tapered sleeper

1/2-in. fiber roof underlayment

3/4-in. plywood sheathing

BY EMANUEL A. SILVA

There are tons of reasons to build a deck over a roof, from creating a romantic outdoor breakfast nook off a second-floor master bedroom to providing a second-floor porch on a city house. No matter the reason, the keys to a long-lasting deck above a living space are the same: a reliable roof membrane and details that minimize any damage to the roof from the deck loads. I like rubber roofing for this, combined with a floating deck floor. The rubber roofing I've been using for 15 years—a glue-down, 60-mil EPDM membrane from International Diamond Systems—offers several advantages. It's reliable, it's fairly easy to work with, and it requires no special tools. That said, a lot of people subcontract the roofing work and build the deck themselves. Either way, the roofing has to be right.

Framing the roof

Whenever I install decking over a roof, I make sure the framing is structurally sound and properly pitched to drain water. The project illustrated here was a complete teardown and rebuild, so I framed the roof with 2x8s spaced on 16-in. centers, supported by a beam and a ledger as on most decks. Because these 2x8s were also

FIBER UNDERLAYMENT PROTECTS ROOFING

Nails can back out of plywood or OSB over time. A layer of fiberboard prevents them from penetrating the roofing.



Don't overlap the seams. Offsetting the joints in the fiberboard from those in the sheathing makes a smooth surface.



Use the big washers. Screws and 3-in.-dia. sheet-metal washers mean that only 16 1⁵/₈-in. fasteners are needed per sheet. The washers are sold by roofing-supply houses.



EPDM membrane

Peel-and-stick EPDM tape

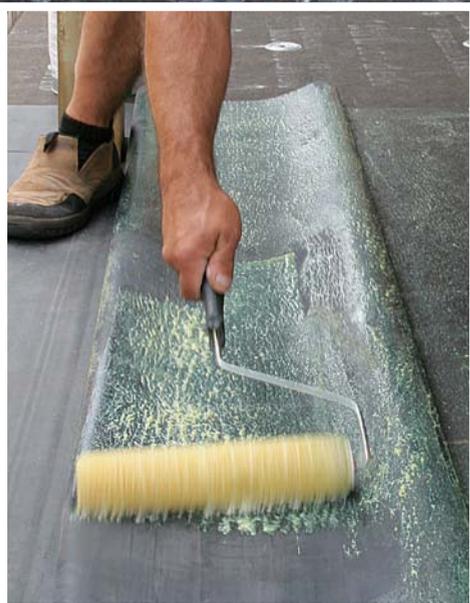
Drip edge

RUNNING THE RUBBER

Installing large sheets of rubber is easier than it looks, although it's a big help to have a second pair of hands on the job.



Dry-fit first. Roll out the rubber sheet so that it's square to the roof, then use scissors to make the cuts needed around penetrations such as posts. Before gluing the rubber, be sure to clean it with a manufacturer-recommended solvent.



Roll the rubber membrane halfway back. Working in approximately 2-ft. swaths, spread the adhesive on both the rubber and the substrate.



Make it permanent. Once the glue is barely tacky, unroll the rubber over the glued area, and smooth it out with a J-roller.



Up the wall. Adhering the rubber about 2 ft. up the adjacent wall is part of creating a watertight system.

the framing for the ceiling below, and because I wanted to keep all the cuts square, I framed the roof level. To pitch the upper surface ¼ in. per ft. for drainage, I ripped 2x4s on a taper and screwed them to the tops of the joists.

It might seem like it would have been easier to start with 2x12s and rip them to a taper. The trouble with that approach is that the allowable span of a joist or rafter depends on both its species and its grade. The grade depends largely on how close knots and other defects are to the edge of the board. In ripping a board, a knot that had existed harmlessly in the center is now close to the ripped edge, compromising the board's strength. For that reason, code does not allow the use of ripped lumber for structural purposes.

Continuous notched 4x6 posts support the framing and also serve as rail posts. The roof sheathing is ¾-in. CDX plywood, glued and screwed to the framing.

To create a smooth surface and to protect the bottom of the rubber roofing from any fasteners or rough edges on the plywood, I installed ½-in. fiber roof underlayment as a final substrate. Each board is secured with 16 1⅝-in. screws and 3-in.-dia. sheet-metal washers.

Where the roof ties into the house, I removed the siding about 2 ft. up the wall and about 1 ft. out on each side. This enabled me to fully adhere the roofing membrane about 2 ft. up the sheathing and then counterflash with a self-adhering butyl membrane. I pulled back the existing building paper after stripping the siding, installed the butyl membrane, and lapped the building paper back over it. This procedure makes for a watertight connection on ordinary rainy days, but it also protects against wind-driven rain or deep snow sitting on the deck up against the house.

Glue down the EPDM roofing

EPDM roofing is available in a variety of widths and in lengths up to 100 ft. Here, I needed enough rubber to overhang about 1 ft. on each end, and it had to be wide enough to run about 2 ft. up the house wall and to overhang the edge of the deck by at least 2 in. Because I was using up leftovers from another job, I did this roof with two pieces of rubber, which I joined in the middle with Rubberall Splicing Adhesive. In most cases, though, I'd simply buy membrane big enough to cover the roof in one piece. After sweeping the underlayment clean and making sure there were no protruding fasteners, my helper and I laid the rubber down on the underlayment and fitted it to the house and against the posts. I made cutouts for the posts, then split the rubber beyond the cutouts so it could be placed around each post.

Next, we rolled back the rubber about halfway toward the posts. Working about 2 ft. at a time, we wiped the membrane with Rubberall's membrane cleaner and then spread its bonding adhesive on both the underlayment and the membrane using a paint roller. It's a contact adhesive, so once the glue was set enough that my finger barely stuck to it, we slowly rolled the membrane over the glued area, making sure not to make any air bubbles, and smoothed it with a J-roller.

We continued toward the house in 2-ft. sections and finished by gluing the rubber about 2 ft. up the wall. We then turned around and glued the rubber around the posts and over the PVC fascia. The glue extends about 2 in. down the fascia. We let the excess rubber hang for the time being.

To protect the outer edge from damage, we installed a 3-in. aluminum drip cap all around the perimeter, fastening it every foot with

DETAILING THE ROOF EDGE

Use permanent trim around a permanent roof. PVC won't rot, it takes paint well, and you can glue rubber roofing to it.



Glue the roofing to the fascia. Spread the adhesive on the rubber roofing and about 2 in. onto the board below.



Drip edge protects the corner. Nail a 3-in. aluminum drip edge over the corner of the roof. Guide a knife along it to trim the excess rubber.



Seal the drip edge. Use uncured EPDM tape to cover the nails and seal the drip edge to the roof. Uncured EPDM must be protected from UV rays, which the decking will do once installed.

FLASH THE POSTS

Any penetration in the EPDM membrane is a potential leak, so the posts on this roof required special attention. They were wrapped with rubber and then flashed to the roof with scraps of rubber and splicing adhesive. The challenging areas to flash are the post corners.



Wrap the post first. Wrapping the post with membrane provides a reliable base for gluing additional rubber for flashing.



Paint on the glue. Spread splice adhesive on the roof and on the post wrap.



Start at the bottom. Split a scrap of rubber so it can go around the corner while lying flat on the roof. Stretch the rubber a little so the apex of the split is placed above the roof plane.



Overlap the first layer. Split a second scrap of rubber like the first. Install it to wrap the corner and splay onto the roof. The apex of its split must be on the roof so that the two apexes don't align and create a potential leak.



Counterflash. Once the post is fully flashed to the roof, counterflash with layers of bituminous membrane going up the post about 3 ft.

2-in. hot-dipped galvanized roofing nails. I trimmed the rubber with a knife so that it would be even with the bottom of the drip edge. To waterproof the inside edge of the drip cap and to protect the nail penetrations, I covered the joint with uncured-EPDM peel-and-stick tape. Starting with the bottom edge of the roof and finishing up with the sides yields a shingle effect that will prevent water from entering.

Integrating the posts into the roofing is the hardest part of this job; getting roofing to seal around the corners of the posts is both vital and challenging. I could have bought premade corners for the posts, but they're expensive. Instead, I made corners from membrane scraps, overlapping them and gluing them in place with splice adhesive. I

counterflashed with a butyl membrane to about 3 ft. up the post, and eventually wrapped the posts with PVC trim.

Let the sleepers lie

The next step was to lay out the sleepers 16 in. on center, on top of the joists below. To prevent the sleepers from wearing through the EPDM roof, I laid additional 4-in.-wide strips of rubber membrane below the sleepers' locations.

I wanted the tops of the sleepers to be level, so I ripped pressure-treated 2x6s in half so that their bottoms tapered to match the roof pitch. At their thinnest part, the sleepers are 1½ in. deep, so the 2-in.

FINALLY, IT'S TIME TO DECK

Installing the decking is straightforward. Tapered sleepers ripped from 2x material ensure a level walking surface. Glue and nails secure the decking.



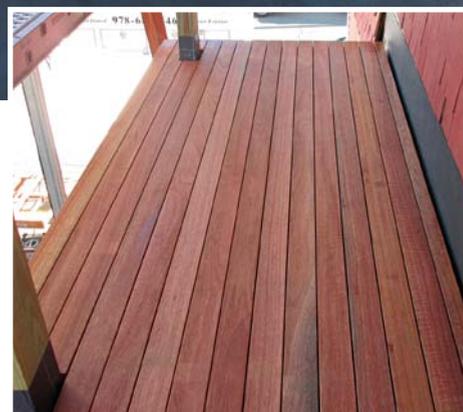
Place the sleepers. Strips of 4-in.-wide EPDM provide a layer of protection between the sleepers and the roof. The sleepers aren't fastened in place, and the floor floats.



Glue does the work. The decking nails are mainly there to clamp the boards until the urethane sealant sets up.



Nail down the decking. Short, 2-in. stainless-steel finish nails fasten the mahogany decking to the sleepers. PVC trim will hide the gap between the decking and the post and help to hold the decking down.



Just details left to go. A second coat of Penofin (the boards were all coated and dried before installation), rails, trim, siding, and paint are all that's left.

decking fasteners won't stick through. Cutting pressure-treated lumber exposes the untreated core, so I applied Wolman CopperCoat wood preservative to all the cut sides and ends to help prevent rot.

Any penetrations in the roof membrane made by fasteners are potential leaks, so the sleepers just rest in place. The post wraps help prevent the decking from uplifting.

So that the finish would have time to dry, I had coated all six sides of the mahogany deck boards with Penofin a week earlier and had stacked them with sticks between the layers. As I worked, I recoated all the cut edges. To secure the decking, I used 3M 5200 Marine Adhesive Sealant, a tough, waterproof urethane normally used as

boat glue. I followed the adhesive with stainless-steel finish nails. The nails' main function is to clamp the boards while the glue cures, which is what provides the real strength. I finished up by applying another coat of Penofin to the boards. This helps to hide and seal all the small nail holes and gives the boards one more layer of protection.

With the decking down, the rest of the job was the same as any other porch. I wrapped the posts with a 3/4-in. PVC trim board and added railings, then replaced the siding and called in the painter. □

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