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Triple-Duty Deck

A rubberized coating embedded in fabric caps this rooftop deck

by Zot Barazzotto

I've been building for a long time. I started helping my dad when I was old enough to walk, worked my way through college as a carpenter and an electrician, and as an engineer became involved with energy-efficient construction and solar in the late 1970s. Despite my experience, however, there wasn't much I could do to fix up my new wife's two-story house to make it more practical for a couple getting older. So I convinced her that it was time to design and build a new one-story, fully accessible home.

Because the design included a full walk-out basement, the deck at the back of the house needed to be raised to the level of the main floor so that a wheelchair could easily make it over the threshold. I previously had owned a house with a deck like that, and since it created a parking space underneath, I eventually installed what amounted to a roof to shed water to create a car port. This time, I wanted the deck to be completely waterproof from the top down as part of the design, because there would be a fully-enclosed two-bay garage/shop underneath the deck.

While there are a lot of options for creating a waterproof roof deck, I eventually settled on a system offered by Ames Research (amesresearch.com). The system, which is installed over a plywood substrate, consists of an elastomeric waterproof base coating (called Super Elasto-Barrier) that is reinforced with a polyester fabric and a skid-resistant, colored top layer (called Safe-T-Deck). While not tested or approved as a pedestrian traffic coating or as a Class A fire-resistant walking and roof deck surface, I was attracted by its simplicity and relatively low cost. My building inspector didn't have any issue with my plans, or with the fact that the manufacturer couldn't provide me with an ICC-ES report.

Framing

The house was built with SIPs, but I stick-framed the deck and the garage underneath. Three PT glulam beams that span between the house and the outer wall of the garage provide the main structural support for the roof deck (**Figures 1, 2**). Intermediate posts on footings support the glulams, so that

Figure 1. Three treated glulam beams provide the main structural support for the deck.

Figure 2. The beams are pitched 1/4 inch per foot for drainage, and support the roof deck's 2x10 framing.

Figure 3. The author applied adhesive to the joists before fastening the 3/4-inch T&G plywood to the deck framing with screws.

Figure 4. To prevent the plywood joints from telegraphing through the finish, the author filled the joints and other cracks with Bondo and sanded them smooth.

they are attached to—but not supported by—the SIP walls. To provide the roof deck with the required 1/4-inch-per-foot slope, I duct-taped a 3/4-inch-thick block to my 4-foot level at the 3-foot mark and used the modified level to help set the glulams and other headers to the proper pitch.

Even though the structure would be waterproof, I used PT framing for the 2x10 joists just in case the deck should ever leak. Pressure-treated lumber varies a lot dimensionally, however, which presented a problem with making the deck perfectly flat. In hindsight, I probably should have used LVLs (which I used on the main house) or steel, which would have resulted in a flatter deck. It would have eliminated the effort spent ripping and planing the joists to make them dimensionally uniform, as well as the time spent aligning the joists over the center glulam, since they could have been sized to span the entire width of the structure.

Knowing that there might be delays in getting the deck waterproofed, I used 3/4-inch DryPly T&G plywood—which has a water-repellent coating—for the underlayment (buildgp.com/dryply-plywood). To prevent squeaky floors, I first spread construction adhesive on the joists, then screwed down the panels using a Muro deck screw gun, following the manufacturer's spacing and fastening recommendations. Finally, I filled the joints and cracks with Bondo wood filler

and sanded the surface smooth to prep the roof deck for finishing.

Flashing

The house cladding is brick veneer. To properly flash the deck-to-house connection, I cut into the mortar joint two brick rows up from the level of the deck and inserted metal flashing into the cut slot. I cut the flashing from a roll of painted aluminum coil stock and bent it to make a short leg to fit into the mortar joint and a longer leg to extend out over the plywood deck. Then I refilled the mortar joint with silicone sealant to hold the flashing in place.

Ames Research sells an isobutylene peel-and-stick seam tape for use with its deck system. After I installed the metal flashing, I used the seam tape to seal the flashing to the plywood deck and cover the aluminum so it would have a fabric surface to hold the Super Elasto-Barrier waterproof coating. The seam tape also offers some flexibility to allow for expansion and contraction of the deck surface.

I flashed the perimeter of the deck with standard painted aluminum drip-edge, again sealing the metal to the plywood deck with seam tape. J-channel (used for vinyl siding) installed under the drip-edge provides space for the vinyl soffit material that I used to trim the front of the deck framing.

I also flashed the bases of all the guard posts with strips of the polyester fabric that comes with the system, extending the fabric up the posts about 4 inches and embedding it in the Super Elasto-Barrier. Note that I couldn't use the seam tape here because its neoprene backing makes it fairly thick, and the vinyl post sleeves that I used to cover the PT guard posts wouldn't have had enough clearance.

Waterproofing

While the manufacturer suggests applying its Super Primer prior to waterproofing over new surfaces, I felt that the plywood decking had weathered enough that I could skip this step.

I used both a roller (the suggested method) and a trowel to apply the Super Elasto-Barrier, which is a rubberized coating. The roller may be faster, but I found that the trowel was easier to use by myself and that the troweled finish looks as good as the rolled finish. The polyester roof fabric that is used with the system is a meter wide, which is about as far as I could reach to work a section with my trowel. The fabric gets embedded in the wet coating, and

Figure 5. Patches cut from the polyester fabric supplied with the system were used to flash the guard posts and other penetrations through the roof deck.

Figure 6. After flashing the joint between the deck and the wall with aluminum, the author sealed the metal flashing to the plywood with self-adhesive seam tape.

Figure 7. The taped seams and flashed guard posts needed to be embedded with the Super Elasto-Barrier rubberized coating, which the author applied with a brush.

Figure 8. The author then applied the waterproofing to the main roof deck, working in roughly 3-foot-wide sections to correspond to the width of the polyester reinforcing fabric, which comes in 1-meter-wide rolls.

then more of the coating is poured out and spread over the fabric so that it's thoroughly saturated.

My technique was to pour about ½ gallon of the rubber coating onto the deck at a time, then spread it out with the trowel before rolling out a section of fabric. While you're embedding the fabric into the coating with the trowel, the trick is to make sure that folds and wrinkles have been smoothed out before moving on to the next section. I overlapped the fabric joints so there was a continuous layer across the entire deck. The fabric joints are thin enough that they don't telegraph through the final finish.

Because it was summer, the coated fabric dried thoroughly overnight, and I was able to apply additional coats of the Super Elasto-Barrier the next day. According to the manufacturer, it takes about 3 gallons of the rubber coating for each 100 square feet of coverage at the recommended final thickness of 30 mils (about the thickness of a dime).

Finish

Once the waterproofing layer had cured, I rolled on a couple of coats of Safe-T-Deck top coat, also from Ames. This is a plastic paint with granules that creates a non-skid finish. I used this on the waterproofed deck, as well as on the PT stairs (including treads, risers, and stringers) leading up to the deck.

I finished the deck edges with vinyl fascia and soffit underneath to match the rest of the house. A pergola on top provides shade and makes our triple-duty deck a little more comfortable when we have a moment to sit down and enjoy the great view. Inside, I now have a weathertight garage with extra room for yard and garden stuff. As a bonus, the deck provides a means of egress from each back room in the house in case of fire (though not officially listed as such on the plans).

After more than a year of service, the surface still looks great. Most stains wash off with a hose or fade with time, though I expect that it will require another top coat in a few years to keep it looking fresh. Only time will tell, but at an installed cost of about $3 to $4 per square foot (which includes drip-edge and perimeter flashing, but not my labor), the system seems like a bargain compared with my other options. ❖

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Figure 9. The fabric was laid out over a wet coating, then embedded into additional coating with either a roller or a trowel. It took several coats to build up to the 30-mil thickness recommended by the manufacturer.

Figure 10. After the final coat of waterproofing cured, the author began applying the first of two coats of Safe-T-Deck top coating.

Figure 11. The top coating, available with or without non-skid granules, went on quickly with a roller.

Figure 12. After more than a year in service, the textured deck surface has proven to be durable, stain-resistant, and leak-proof.