



Deck Skylights

Structural glass panels light up a basement entry

by Rob Corbo

My small remodeling company doesn't build a lot of decks, but we have some clients we always like to work for, regardless of the project. Mrs. "X" is one of them: decisive, appreciative, and hands-off. So we were happy to take the job when she asked us to replace the small backyard deck attached to her urban New Jersey brownstone. The old deck was sound but weathered, and she wanted a new one that was built with low-maintenance materials rather than wood. But when she said she wanted it to have a glass panel that would provide a little more light to the basement entry underneath, we knew we'd have to do a bit of homework (**Figure 1**).

Since the deck footprint wasn't changing, there weren't any plans to work from. To help our client choose decking and railing, I gave her a few catalogs, including one from TimberTech. Meanwhile, I started making phone calls and went online to learn about structural glass panels.

Figure 1. The basement entry to this Hoboken brownstone was gloomy, thanks to a small deck overhead. The plan was to introduce more light by adding a skylight to the deck above.



Structural Glass

We'd never installed a skylight in a deck before, and none of my contacts or regular suppliers know much about structural glass. After a little sleuthing, though, I discovered Circle Redmont of Melbourne, Fla., a company that specializes in residential and commercial structural glass and glass-block systems (circleredmont.com). When I contacted them and discussed the project, they recommended their SolarWhite glass-block panels, sized to fit our 18-inch by 98-inch opening.

This prefabricated system consists of hollow 8-inch by 8-inch by 4-inch glass blocks contained within a structural aluminum frame. The panels, which weigh about 20 pounds per square foot, can support live loads of at least 60 pounds per square foot over a 5-foot span, according to the manufacturer. Because they are weatherproof and thermally efficient, they can, if properly detailed, even be installed as skylights over living space. Our installation was simpler, as we didn't need to keep the area under the deck dry, but since the panels would be walked on, they needed a non-skid sandblasted architectural swirl finish.

The single 17 $\frac{1}{8}$ -inch by 98 $\frac{3}{8}$ -inch panel originally specced for our opening would have weighed about 250 pounds (shipping weight was 350 pounds). Access to the backyard of a Hoboken brownstone is limited, so to make the glass a little easier to wrestle from the curb to the back deck, we decided to order two smaller 17 $\frac{1}{8}$ -inch by 49 $\frac{3}{16}$ -inch panels, which would weigh only about 120 pounds each (**Figure 2**). Once the owner approved the design and the \$2,400 price (plus \$400 shipping), I forwarded a 50% deposit to the company to secure delivery, with a four- to six-week lead time.

Framing

The original deck had been built at the same time as the addition it was attached to, and the deck joists had been pocketed through the addition's masonry wall and fastened directly to the floor joists inside. On the opposite side of the deck, the joists were supported by a property-line separation wall built with 8-inch concrete block, with bricks laid between each joist (**Figure 3**).



Figure 2. Structural glass-block skylights are heavy, so the author ordered two smaller units instead of one large one to make handling easier.



Figure 3. The deck framing is partially supported by a concrete-block separation wall. Doubled 2x6 joists used to frame the rough opening for the skylight were reinforced with 1/4-inch by 5-inch steel plates.



Figure 4. To support the skylight, workers glued, nailed, and bolted a 3-inch-wide ledge to the rough opening. Plywood was used as temporary decking during construction.

After demolishing the existing PT decking, we lopped off the joists at the addition wall and removed the joists and bricks from the top of the block wall. To create a level sill, we filled the exposed block solid with mortar. We then lag-bolted the new ledger to the cut joist ends, reinforcing the connection to the 3-wythe brick wall with masonry anchors. We also bolted a PT sill to the top of the separation wall. One end of each new joist is connected to this sill, and the other end is hung from the ledger with joist hangers.

By the time we were ready to frame the new deck, the block-panel manufacturer had supplied us with a shop drawing and installation guide that provided us with the information we needed to frame the panel's rough opening. Since we were installing two 125-pound panels into a 2-foot by 8½-foot opening in a deck that measured 5 feet by 18 feet, we were

concerned that the size of the rough opening and the weight of the panels would compromise the structural integrity of the narrow deck. We couldn't easily use joists any bigger than the original 2x6s, so we reinforced the four sides of the rough opening with ¼-inch by 5-inch steel plates sandwiched between doubled 2x6s, all bolted together.

Once the rough opening was completed, we had to create a ledge for the panel flange to sit on. The thickness and height of the ledge was dictated by the 4-inch panel thickness and the 3-inch width of its metal flange. Since the decking measured 1 inch thick, we located the top of the ledge 3 inches below the top of the joists—4 inches below the finished deck surface—so that the glass surface would be flush with the decking (**Figure 4**). We built the ledge with double two-by material inside the rough-opening frame.



Figure 5. The skylight units were installed one at a time, with shims as necessary to level them and provide full bearing. Grey silicone sealant supplied by the manufacturer was used to fill the joint between the two units.

Because of the steel-plate construction, we attached the first layer of the two-by ledge to the framing with construction adhesive and 10-penny nails. We attached the second layer to the first, again with adhesive and 10-penny nails, finally lag-screwing the doubled ledge to the framing with 4½-inch lag bolts. We then dropped the two glass panels into the opening without difficulty (**Figure 5**).

Finish

Once the glass panels were fastened in place, we installed the treated rail posts and stair stringers. Then we fastened the grooved TimberTech XLM decking (timbertech.com) to the joists with the manufacturer's hidden fasteners—though it was a new system for us, it was easy to install (**Figure 6**).



Figure 6. With the skylight secured to the framing, workers installed the TimberTech XLM decking, which was secured to the joists with hidden fasteners. The decking was laid out from the edge of the skylight rather than from one of the deck edges.

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Figure 7. The skylight has a non-skid finish and is flush with the decking (above). TimberTech RadianceRail finishes the deck off (top right).

Figure 8. When the skylight is covered with snow, an LED rope light helps brighten the area under the deck (right). In warmer weather, the illuminated skylight adds a unique decorative accent to the deck.

As occasional deck builders, we liked the one-stop shopping approach that allowed us to finish the deck with one company's products. We covered structural components with TimberTech's coordinated accessories, built the railing with the company's RadianceRail kit (**Figure 7**), and installed its DeckLites LED riser lights.

When I visited our client recently on a snowy January day, I noticed that she had added a simple LED rope light to the underside of the skylight (**Figure 8**). She was pleased with the way the new deck dresses up her small backyard—and with the way her new skylight brightens up what was once a gloomy access to her basement. ❖

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