A Built-in Gutter Helps Solve a Design Problem

BY JONATHAN CURTIS

The clients felt that the addition's mass was too big and its height competed with the main home's height **(1)**. Here, the second-floor wall framing is demoed to make way for a revised framing solution **(2, 3)**.

The wall of the second-floor shed dormer was moved 3 feet back from the first-floor's exterior wall **(4)**. A "mass-reducing" roof with a built-in gutter was framed over the resulting exposed second-floor deck **(5)**.

Photos by Jonathan Curtis and Ryan Labrenz

I'm a carpenter who primarily works in the Hudson Valley region of New York. Currently, I'm finishing up an addition-remodel of a Victorian-style home that the company I work for, New Dimension Construction, began this past January.

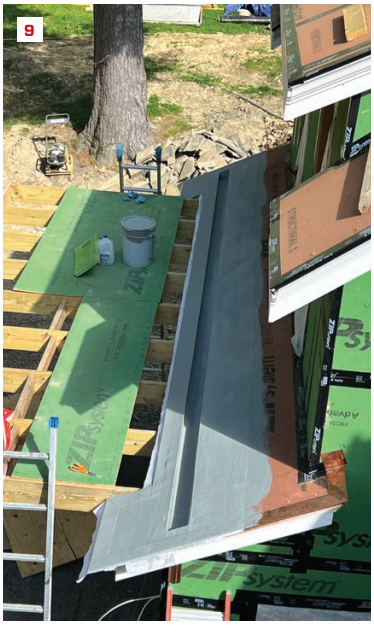
Central to the project is a two-story addition with a kitchen on the first floor and a bedroom on the second. In plan view, the addition forms what is essentially a new east wing, which changes the home's previous L-shaped building footprint to a U-shaped one. The existing west "wing" is a section of the home that we're renovating; it contains a new first-floor sitting room and remodeled second-floor master bathroom. The two wings are separated by a new stone patio area.

An interesting feature of the addition is a trellis that projects out from its north-facing end wall. Framed with pressure-treated 2x10s sistered onto the second-floor framing, the trellis cantilevers out 7 feet. To support the cantilever, we ran the trellis framing 14 feet back into the building and secured it to the floor joists with a tight on-center pattern of 12-gauge framing nails and 3-inch LedgerLok screws. (Mahogany will cover the trellis's framing, and steel cables will run up from grade to allow vines to grow onto the structure.)

Design problem. While we were framing the addition's roof, the homeowners visited the jobsite and noted that the addition looked too big and its height competed with the height of the main house **(1)**. Also, they didn't like how the sight lines from the remodeled second-floor bathroom window would be blocked by the addition. We had framed the addition according to the design plans, so the architect was brought in to look for ways to reduce the mass of the addition.

The homeowners were reluctant to reduce the size of the kitchen, and they didn't want to give up the trellis. The only feasible option was to step back the second-floor's shed-dormer wall (offsetting it from the first-floor wall) and frame a small, sloped roof up from the ends of trellis joists to the dormer's wall. The hope was the small, 4:12-pitch roof would help to break up the imposing feel of the addition's end wall while also improving the sight lines from the remodeled master

At the trellis, the roof's edge is nearly in line with the face of the exterior wall below. The gutter's downslope edge is flashed with copper **(6)**. A custom-built copper drop tube is installed at each end of the gutter **(7)**.



The base coats (a tack coat with reinforcing fabric set into it and a saturation coat) are first applied to the trough and downslope portions of the gutter **(8)**, then to the upslope **(9)**. Two finish coats are applied **(10)**. The fluid-applied system results in a 45-mil thickness.

bath's window. Also, the roof would be in keeping with the look of the rest of the home, as there were similar low roofs on the south and east elevations.

To manage run-off from the roof, we suggested a built-in gutter. Our company has installed a number of these over the years and has had success with them. With the trellis in the way, it would be impossible to pick up the water and prevent icing on the kitchen's slider step below using a conventional gutter. The homeowners and architect liked the idea and gave us the go-ahead to build it.

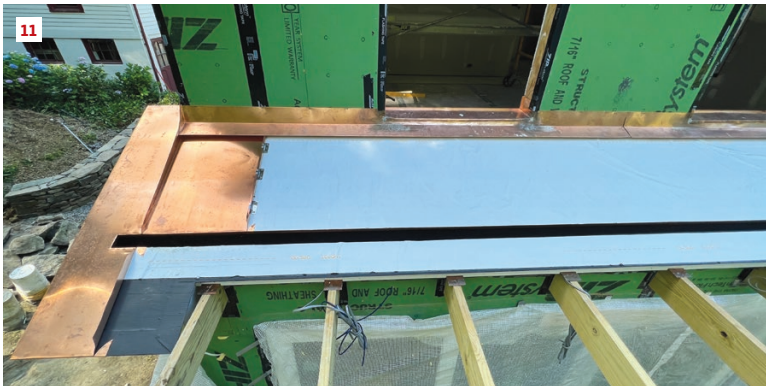
Framing "do-over." We demoed the gable and shed-dormer end walls **(2, 3)**, then reframed the second-floor walls and roof, stepping the shed-dormer wall 3 feet back from the first-floor's exterior wall. Next, we started on the "mass-reducing" roof, framing it on top of the second floor's 3-foot-wide, now-exposed deck.

Gutter rough-in. After determining the roof and gutter dimensions, we made a sketch of the built-in gutter's profile to verify our cut angles. We planned for its side walls to be 90 degrees relative to its bottom, with beveled cuts at the tops to match the 4:12 roof pitch.

Working from a bench, we built the 19 1/2-foot-long rough gutter in two 9-foot-9-inch-long sections out of pressure-treated 1-by stock. We wanted the gutter's high point to be in the middle, so we snapped lines onto lengths of 1x10 side-wall material representing the downward slope from the center point (at a 1/8-inch-per-foot slope, the gutter's depth varied about 1 1/4 inches from the center high point to the outside-end low points).

We clamped lengths of 1x10 side-wall material on edge spaced 5 inches apart, then fastened them through the face of 1-by stock into the sloping pressure-treated 1-by bottom to make two 5-inch-wide, U-shaped troughs. We glued and screwed all the seams, using Sikaflex sealant (sika.com) for its ability to stretch and prevent joints from cracking and opening up due to seasonal changes.

Finishing up, we bevel-cut the side walls to match the 4:12 roof slope (resulting in a 7-inch-high back wall



Copper windowsill pan flashing is soldered to continuous apron flashing at the roof-to-wall junction. Standing-seam panels are locked into drip-edge flashing along the upslope edge of the built-in **(11)**.

Shown in foreground, the addition forms a new east "wing" on the home. A future stone patio will separate the addition from the heavily remodeled existing west "wing," shown here in the background **(12)**.

The completed standing-seam copper roof **(13)**. Copper downspouts will be installed later **(14)**, as well as a copper gutter and downspout on the shed-dormer roof above.

and a roughly 5 1/4-inch front wall, as measured from the interior at the gutter's high point), then joined the two trough sections at the center high point and installed 1-by tapered pieces at each end. We lifted the completed gutter in place, checked it for straightness, and fastened it to the outer edge of exposed strip of the second-floor deck.

We framed the small roof with 2x6 rafters, attaching them to the back wall of the built-in gutter at the eaves and a ledger fastened to the stepped-back shed-dormer wall **(4)**. After sheathing and taping the roof, we ran site-bent 16-ounce copper edge flashing around its perimeter **(5)**. (The homeowners decided they wanted to dress up the lower roofs with copper; the upper roofs were asphalt shingle.) Then, we flashed the downslope edge of the gutter with copper **(6)** and custom-built copper drop tubes, one for each end. Prior to installing the two-piece drop tubes, we routed out the 1-by bottom about 1/8 inch to plane the flashing in to the rough gutter to avoid ponding, then set the flanges in Sikaflex **(7)**.

Lining the trough. While metal-lined gutters are known for their longevity, they are not maintenance-free; soldered seams can fracture from expansion and contraction. We chose instead to line the gutter with Acrylabs, which is a less-costly, solderless alternative to a copper lining. Acrylabs is a seamless, fluid-applied acrylic elastomeric roof system that our company has used on a number of roofing projects (see "A Versatile Fluid-Applied Roofing Solution," Nov/Dec/20). The system consists of a tack coat (with reinforcing fabric set into it), a saturation coat, and two finish coats that dry to an approximate 45-mil thickness.

We first applied the two-coat base with reinforcing fabric to the trough and downslope portions of the gutter (also covering the small roof areas on either side of the trellis framing) **(8)**. We let each coat dry before applying the next. Then, we applied the Acrylabs reinforced base coat to the upslope, running it 18 inches up the roof **(9)**. We applied the two finish coats, using a dark-colored finish coat to help hide the gutter **(10)**.

Finishing up the roof, we laid down a high-temperature underlayment, then installed a copper apron along the roof-to-wall intersection. We integrated windowsill pan flashing into the apron, soldering the seams, then began applying the 16-ounce copper standing-seam panels, working left to right **(11–13)**. Copper downspouts will be installed later **(14)**, as well as a copper gutter and downspout on the shed-dormer roof above, which will help keep storm run-off from inundating the "do-over" roof and built-in gutter.

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