



A Concave Metal Roof

BY WADE PAQUIN

On a recent house build, we were confronted with a detail typical to the coastal, Shingle-style homes we are known for—a small, pop-out roof to protect the garage door opening from weather. The architect had originally drawn this as a straight-hip roof that would be shingled with wood. On this particular home, however, we were using an Eastern-white-cedar sidewall shingle that couldn't be carried over the roof. (In the past, we'd done this with Port Orford cedar shingles that performed well on a roof exposure.) To overcome the problem, I gently suggested to the architect that we install a flared, standing-seam-metal roof instead. He embraced the idea, pitched it to the client, and we set to work.

FRAMING AND TRIM

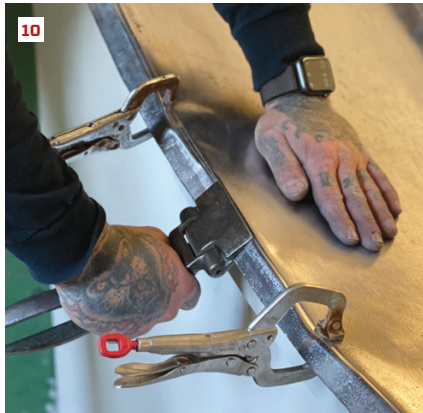
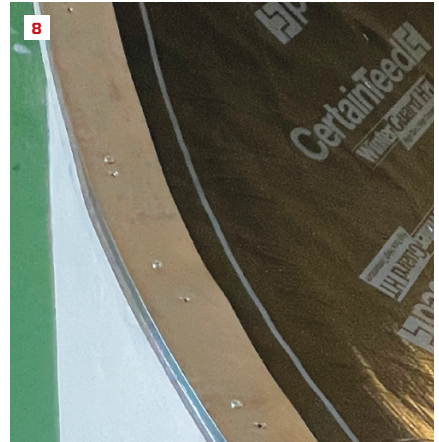
We began by building a 2x8 substructure (ledger, blocking, and subfascia) that we affixed to the wall with SDS screws. To define the stepped soffits, we capped this framing with Versatex cellular PVC on the bottom and top. The top provided a base for attaching curved ribs built from two layers of 3/4-inch CDX plywood. The concave roof surface was made with 2x4 furring strips running horizontally over the ribs. Making this segmented surface proved much faster than bending multiple layers of 1/4-inch plywood (which we have done in the past) and resulted in a sturdier structure. We finished out the rake ends and fascias with Versatex, as well, bringing it right up to the top edge of the furring strips so the metal roofing would cap the top edge of this trim.

UNDERLAYMENT

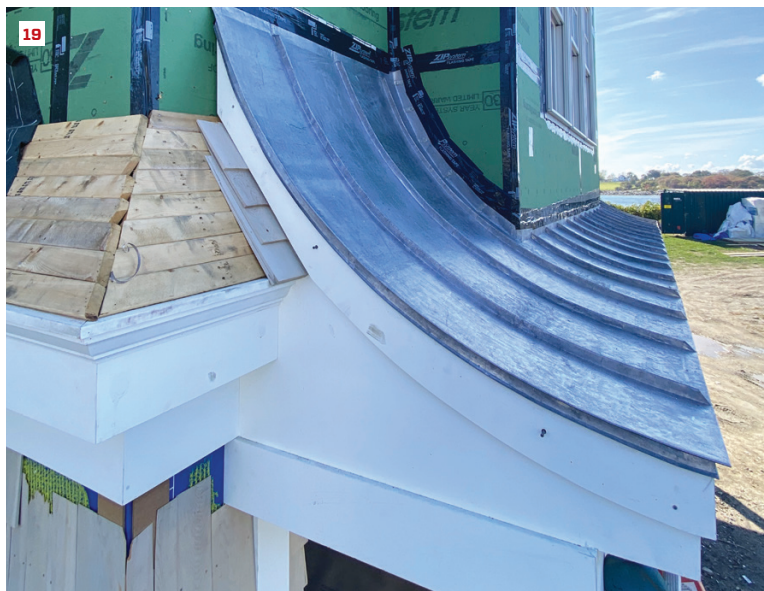
On the coastal homes we build, peel-and-stick ice membrane is our go-to underlayment for most roofs. However, because metal roofing conducts heat so efficiently,

The curve of the roof is seen here in profile, trimmed with cellular PVC (1). Kyle Ouellette begins the metal work by tracing the curve for the rake edge on a sheet of lead-coated copper (2). After cutting the curve with snips, he scores the metal to define the hem (3) and folds it over with tongs (4). With a roller bender, he begins to roll the edge over at an angle to form a drip edge (5).





Ouellette cuts the hemmed and rolled drip edge off the sheet (6) and uses a lock seam to join it at a right angle to a second strip of metal. He reinforces the lock seam with solder from the back (7); this second piece attaches to the roof surface (8). The pans that form the field of the roof start with straight folds in a metal brake. These folds, which will become the “standing seam,” are carefully crimped, little by little, to bend the panel to the roof curve (9). One edge of the pan is joined with a lock seam to the drip edge (10). On the other edge, he begins to form a standing seam with a PVC roofer’s anvil and wedged mallet (11). Each pan is secured to the roof with stainless steel screws through metal tabs folded into the standing seam every 12 to 16 inches (12, 13, 14).



The standing seam is completed with a roofer's anvil and mallet, with the long leg on the second panel folded over the bent rib on the first (15). Once the seams are folded together, they are pressed tight with tongs (16). At the transition between the metal roofing and the wall, the top of the pans are folded over (17) to prepare for seaming them to a horizontal strip of transition metal (18). The top edge of this transition flashing is taped to the sheathing with Zip System tape (18, 19).

ordinary ice membrane is at risk of melting in direct sun. This can create a dripping mess—a callback we can't afford to have. Instead, we installed a high-temperature underlayment rated to withstand roof temperatures up to 260°F.

CURVED STANDING-SEAM METAL

At this point, we turned the task of forming the concave standing-seam-metal roofing over to Kyle Ouellette of Liberty Building Envelope. Using lead-coated copper, he and Kory Demello began with the rake drip edges—the hardest and most time-consuming

part of the job. Making these two rake pieces for each side of the roof easily consumed about 70% of their time. To illustrate the process, we did a full mock-up in Kyle's shop to photograph for this article. For the actual job, the rake pieces and curved pans were cut and formed in his shop, but all the seaming work was done in the field. Ordinarily, the pans would be installed in the field beginning at the center and working out in both directions to each rake end.

Wade Paquin runs WKP Construction, a custom home building and renovation firm based in Newport, R.I.