A Screen Porch Dresses up a Ranch

Wide overhangs and a wraparound stone patio keep this elegant outdoor-living area cool and dry

Scaffold provides work station for assembling trusses on site. Heavy 6x8 beams spanning from the house to the porch's corner posts carry trusses constructed of 2x4s and custom-made steel plates. Heavy beams allow for open walls that are sheltered by 2-ft. deep eave overhangs.

by Alex L. Varga

"Something there is that doesn't love a wall; that wants it down." I know this line from Robert Frost's *Mending Wall* evokes a deeper meaning; however, it seems that this sentiment applies whenever man endeavors to build a sound and lasting structure. There is always some element of nature or turn of fashion that conspires to alter the structure once it is completed.

I wonder what Frost would have written had he been building a wooden structure. I know I had my work cut out for me when I added a screen porch to a ranch house in Connecticut (top photo, facing page). My clients requested a shaded outdoor-living area that provided views and took advantage of cool breezes coming from the wooded area behind their house. The catch was that the outdoor-living area should have a finished wood floor and lots of wood trim. Digging the foundation 42 in. below grade to get under the frost line was only part of the solution. Here I'll discuss how I designed and built a porch to survive the elements as it provides a beautiful refuge from summer heat and pesky bugs.

Cypress frame over crushed stone—When planning the porch, I followed basic moisture-control strategies: allowing for drainage, creating ventilation and keeping wood out of direct contact with the ground. During the beginning stages of the project, work was required on the house's septic system. With the backhoe on site, I took the opportunity to cut the grade down about 2 ft. in the porch area. I also sloped the grade away from the house.

With the backhoe I then dug six 42-in. deep holes for the concrete foundation piers. Once the piers were in place, I bolted triple 2x10 beams around the perimeter of the porch, supported by the piers and bolted securely to them.

Taking the grade down 2 ft. allowed me to add a layer of crushed stone about 3 in. deep and still have almost a foot of clearance beneath the porch's floor joists. The crushed stone creates a clean and well-drained area under the floor.

The floor joists are 2x8 cypress, which costs a bit more than pressure-treated pine but is naturally, as opposed to chemically, rot resistant. Spaced on 2-ft. centers, the joists are connected with joist hangers to the perimeter beams and to a triple 2x10 center-span beam.

To prevent small animals from getting under the floor system, I attached galvanized-steel wire mesh to the inside surface of the perimeter beams, bent the wire back about 6 in. along the ground and covered the wire with crushed stone. During this phase of construction, I also prepared the site for a stone patio. The patio encircles the porch and extends slightly beneath it; the floor framing is about 3 in. above the perimeter stonework. Unlike the soil and plants that often surround porches, the stone patio allows rainwater to drain away from the porch, giving it a better shot at staying dry and ventilated. The patio also looks great and helps unify the new construction and the existing house.

Another basic moisture-control measure I took was to provide air circulation underneath the porch. I faced the perimeter beams with a cedar skirtboard that's ¾ in. above the stone. This ¾-in. gap runs continuously around the porch and lets air flow freely through the floor system.

Continuous headers and braced posts make for open walls—After putting single 2x4 pilasters at the house and double 2x4 posts at the corners of the floor frame, I installed two 24-ft. long 6x8 header beams on top of the pilasters and posts. The header beams run continuously from the house out to their free ends, which cantilever 2 ft. 6 in. beyond the freestanding posts that rest on the stone patio.

I wanted to keep the sidewalls of the porch open to catch summer breezes and to capture the view of the woods as clearly as I could. So I

Photo this page: Alex L. Varga

The porch is part of a composition. The porch includes a stone patio and an octagonal, covered entry. These elements don't just look good, they help keep water away from the porch. In addition, the porch's roof features large overhangs and gutters for protection from sun and rain. Posts tapered to suggest the shapes of tree trunks support the gable overhang. Lights in the soffits shine on the roof and down around the porch perimeter.

Large screen openings celebrate fall colors. Tinted marine varnish on the fir flooring and decay-resistant cedar and cypress trim, primed on all sides, allow for interior-quality details in the screen porch. The trusses, made of small-dimension lumber, create a branchlike effect. In the soffit bays, 1x6 trim boards hide spotlights.

He didn't run out of roofing boards. Because the roof has such deep overhangs, a ridge skylight was needed to brighten the porch. This unconventional skylight is a series of progressively wider gaps between roofing boards, all covered with a Lexan ridge cap. The trusses and 2x6 roof boards are finished with semitransparent stain similar to the gray of the floor and the stonework.

used single 2x4 posts on 5-ft. centers, which would later be fully cased in 1x trim, to frame the screen openings. Single 2x4 blocks at chair-rail height stabilize the posts against bending and twisting and make the finished screen sizes large but manageable.

The continuous 6x8 headers solidly connect the individual posts together at their tops and create a stable and rigid frame out of a row of rather slender posts. The casing of the posts in 1x trim and the horizontal bracing provided by the chair-rail blocks allow the single 2x4 posts to bear the necessary roof loads easily. To add to the rigidity of these sidewall frames, I used sections of 3-in. steel angle with 8d nails to connect the corner posts to the floor system and to the header beams. These angle brackets were later hidden underneath the finish trim work.

I could have used a bottom plate, but instead I opted to install the 2x4 posts directly on the perimeter beams (drawing facing page). I laid the flooring on the beams and capped the end grain with a 5/4x8 sill that's notched around the 2x4 posts. A double band of blocking topped with a 5/4x6 sill creates a wiring chase that, when covered with 1x4 trim, provides an attractive baseboard detail.

The site-built trusses create a branchlike effect—Inside the porch, I wanted the roof structure to appear light and open, almost treelike in its framework. My idea was to link the structure to the lacework of woods that the porch overlooks. So I designed a cathedral ceiling that would be supported by trusses built with small-dimension lumber, which evoked the image of tree branches better than a framework of rafters and collar ties.

I fabricated the trusses on site using 2x4 fir studs and ⅛-in. galvanized-steel plates cut with a jigsaw. After making patterns, I cut all the truss pieces on the ground and assembled the trusses in place, working from a scaffold (photo p. 52). The trusses are on 5-ft. centers.

Between the trusses, I installed doubled 2x4 rafters. The rafters are braced at the ridge and at midspan by 2x4 kickers nailed to the trusses. Fanning out from the trusses, the kickers provided the branchlike effect that I had been pursuing.

Installed with the bevel face down, the 2x6 tongue-and-groove roof boards provide a little texture, and the dark lines of the bevel joints look good with the 2x4 framework.

Overhangs keep porch cool and dry—The porch roof overhangs the walls all around for shade and for rain protection. At the eaves, 2-ft. deep overhangs match the overhang depth on the existing house. The truss design allowed me to build these overhangs without using large collar ties. Such large members would have appeared much too heavy for the look I wanted. The trusses transfer all of the roof weight to the 6x8 headers, leaving the truss ends free to create the overhangs.

The large soffit overhangs also turned out to be a good place to locate floodlights to light the interior-ceiling surfaces. I hid these fixtures by adding a 1x6 trim detail to the inside top edge of the sidewall beams. Finished with exterior-grade fir plywood and painted to match the main house, the porch soffits are open to the interior. The gable end is also open, eliminating the need for any special soffit or ridge ventilation.

Curved columns resemble tree trunks—At the gable end, an 8-ft. overhang provides a covered section for sitting on the patio in addition to shading and keeping windblown rain from getting into the porch. This deep gable overhang rests on two curved columns I made in my shop. The columns are double 2x4s cased with primed and painted #2 cedar. I got the curved look by gluing and nailing wedge-shaped blocks of 1x stock to the tops of the 2x4 cores. I ripped both edges of cedar casing so that it was tapered, then glued and nailed the casing to the cores. The bottom of a finished column is a 5-in. square; the top is an 8-in. square. The casing conforms to the posts, giving the columns a curving profile similar to that of a tree trunk.

Spacing the roof boards creates a skylight—As the roof structure was nearing completion, I realized that although the porch would be comfortably shady during the heat of summer, it might end up a bit too dark. So before installing the last several feet of 2x6 roof boards, I began experimenting with ideas for a ridge skylight. Rather than cut an opening or a series of openings into the roof deck, I decided to take a hint from the lines of the 2x6 roof boards. In the top 2 ft. on both sides of the peak, I separated the boards after ripping off the tongues on a table saw. Starting with a ¼-in. gap, I widened each

joint between boards to 2 in. at the peak (photo facing page).

Over these spaced roof boards I installed ⅜-in. thick double-wall Lexan sheets, which might be described as plastic, see-through cardboard. Lexan is obtainable from commercial-plastics distributors. First I folded each 4x8 sheet in half along its length, which was similar to folding a sheet of cardboard. Then I set the sheets in beads of silicone on top of the roof framing, leaving a ½-in. gap between the sheets for expansion. I then filled the gap with silicone.

I fastened the Lexan to the roof structure with battens made of ⅛-in. by 2-in. flat aluminum bar stock. I bent the aluminum to fit over the ridge, set the aluminum in silicone over the Lexan and drilled pilot holes through the aluminum and the Lexan into the roof framing. Then I screwed the bar stock to the frame, locking the Lexan skylight in place. This simple but effective skylight allows enough light into the porch to brighten it without overheating it. The resulting light from the spaced 2x6 roof boards is similar to sunlight filtering through tree branches.

Trimmed wall posts hold site-built screens— For the trim on this project, I used a mix of cypress, red cedar and white cedar that I primed on all sides with an oil-based primer. Cedar and cypress have natural resistances against rot and decay. All of the trim was finished with an acrylic latex paint to match the existing house finish.

With the framing trimmed out, I was left with a pattern of 5-ft. square screen openings over smaller 5-ft. by 2-ft. screen openings. I made all the screens using aluminum frame stock and aluminum screen. I made most of the screens on the ground and popped them into their openings. Then I held them in place with 1x2 stock set with finishing nails. If a screen becomes damaged, the 1x2 is removed, and the screen comes right out.

In the upper section of the gable end, I had to fit screens into the triangular openings of a truss. I couldn't use manufactured square corner clips to join triangular frames, and the screen, which has a square cross mesh, wrinkled when I stretched it diagonally. I ended up screwing the frames in their openings and stretching the screen in place.

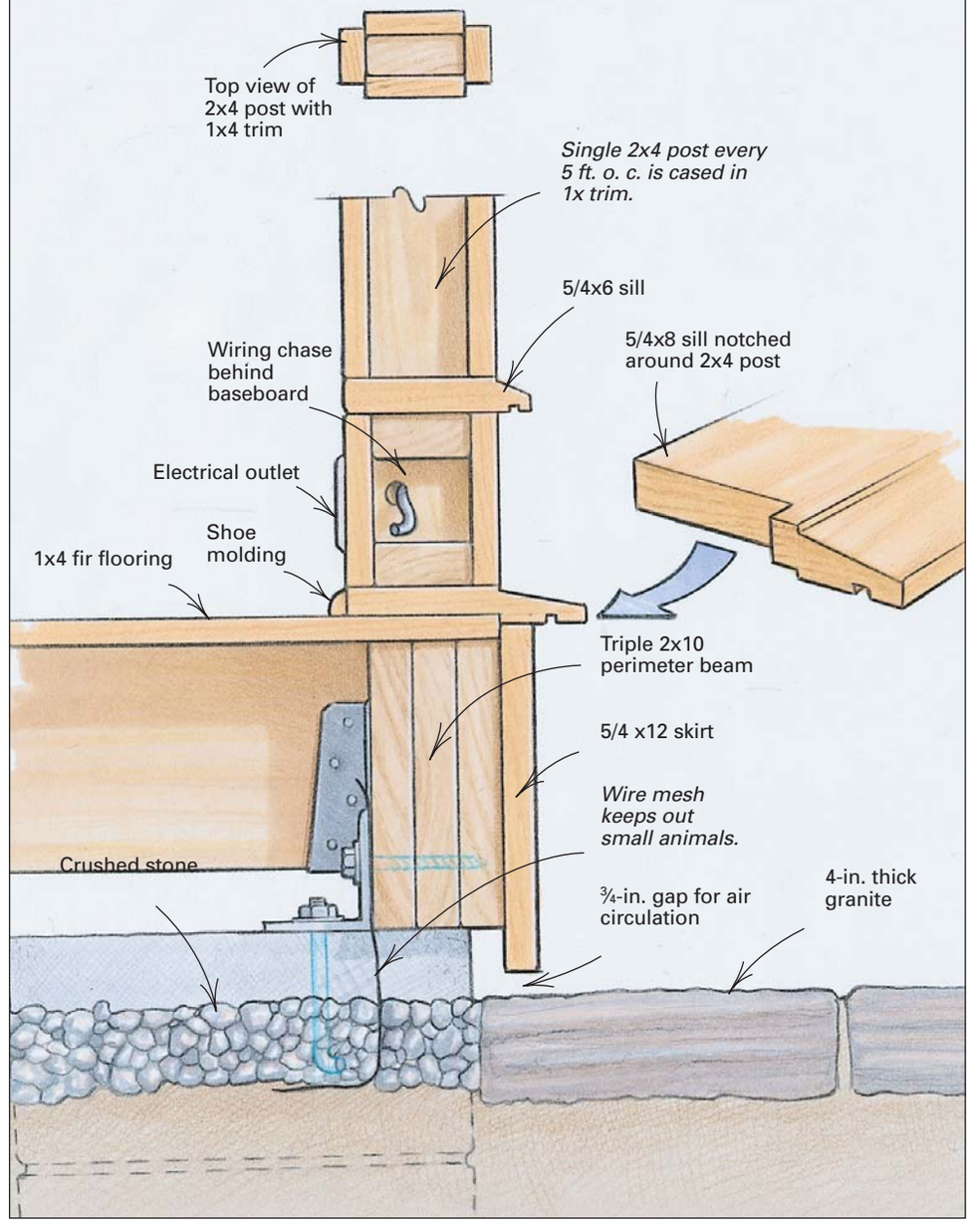
The southwest side of the porch is relatively exposed to both weather and neighbors. Here, I had a roll-down canvas storm shade installed to keep out windblown rain as well as the harsh southeast light in summer. The shade also is a privacy screen, blocking the porch's view from the neighbors' yard.

Tinted marine varnish protects strip flooring— For the floor, I chose ¾-in. by 3½-in. tongue-and-groove fir to achieve a smooth, attractive and easy-maintenance surface. The added advantage of T&G boards for the floor surface is that they create an insect barrier, eliminating the need for screening around the skirt or under the joists. There's no plywood. The flooring runs directly over the joists.

The flooring's color, however, was overly reddish next to the bluish gray of the granite patio.

Section of porch wall at floor

Overlapping trim and sills keeps water away from posts and flooring. A double band of blocking at the base of the wall prevents the posts from twisting and creates a wiring chase.



Drawing: Bob La Pointe

So I decided to mix a tinted but still transparent high-gloss finish. After some research and experimentation, I chose a marine-grade spar varnish as the primary sealing element because it's waterproof and UV-resistant. I mixed the varnish with a small amount of bluish gray stain to help deaden the reddish tone of the fir. I applied four coats to the floor, resulting in a high-gloss, semi-transparent finish with an attractive grayish tint. The only drawback I discovered to mixing the stain into the varnish was that it seemed to slow the curing process. The varnish remained fragile, even though it was dry to the touch, for about two weeks.

With open-air porches it is common practice to pitch the floor approximately ⅛ in. per ft. away from the main building to allow standing water to drain. With this porch, however, I chose not to pitch the floor so that I could keep all of my trim lines and screen openings level and parallel. I thought that the flooring's marine finish, the large roof overhangs with 4-in. aluminum gutters and the roll-down canvas storm screen would provide adequate protection to the interior from splashing water. This combination has proved itself effective.

As a second line of defense against water collecting on the porch floor, I installed ⅜-in. brass bushings on 5-ft. centers around the perimeter of the floor to serve as inconspicuous floor drains. These bushings function reasonably well; in the future, however, I probably will use a ¾-in. bushing to allow any intruding water to drain more easily. □

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