Pergola
Plus
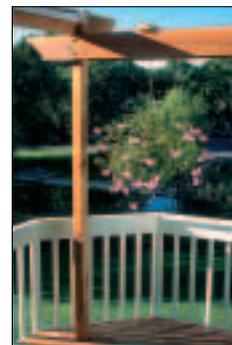### Have it your way!

BY TOM SWEENEY

With a ShadeTree™ canopy system and a custom-built pergola, your deck or patio can have it all.

Seldom have we seen a more perfect marriage of function, versatility and all-season good looks. It begins with three retractable Sunbrella fabric panels that fold flat against the house to let the sun in or extend fully to block damaging UV rays or light rain.

You can order the canopy system with its own aluminum support structure. However, you also can fit it to a wooden framework. We designed and built this custom pergola — basically a smooth interpretation of rough framing.

The wood structure is a key element of the visual appeal because it integrates the shelter with the house in sun or shade, winter or summer and everything in between. Pergolas typically have more tightly spaced joists to create shade from all but the midday sun. The problem is that you are stuck with that shade, or perhaps harsh shadow stripes, whether you want it or not. If you'd rather not turn your picnic guests into a herd of zebras, you should appreciate the ShadeTree solution.

Our design combines the best of all worlds. While the canopy blocks direct sunlight, the color positively glows from above. The atmosphere under this yellow shelter is warm and inviting even when the sun takes the day off. ShadeTree canopies also are available in striped and open-weave colors. We could have selected a muted solid color that blended with the home's siding. But the folks at MarvinGardens, which makes the ShadeTree system, suggested that the yellow fabric would create a cheerful accent. They were right!

The great thing about this pergola/canopy combo is that it lets you enjoy the view outdoors without feeling totally exposed. The broadly spaced posts

Add color and privacy with hanging plants.

PHOTOS BY ERIC AGNESSENS AND STAFF

1 Mark the ends of the ledger, joists and beams using the decorative template as a guide. Then cut just outside the line, as shown, using a jigsaw.

2 Clamp the template to the workpiece at the marked line and rout a smooth profile in a single pass using a piloted flush-trimming bit.

3 After laying out the positions of the joists on the ledger, transfer the marks to the tops of the beams using a combination square.
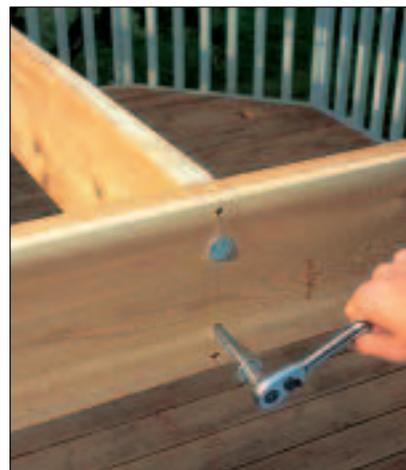
4 Clamp the joists to the ledger with deck screws. Then predrill and reinforce the joints with 3/8 x 5-in. lag screws and washers.

5 Predrill and bolt the Stratton brackets to the house to support the ledger board. Position the brackets so you drill into solid house framing.

6 Secure each post to the deck's main support beam with three 1/2 x 12-in. carriage bolts; or strap and toenail the posts to the top of the beam.

7 Temporarily clamp the pergola's saddle beam to the post and predrill for bolts. A simple wooden alignment jig ensures uniform and straight holes.
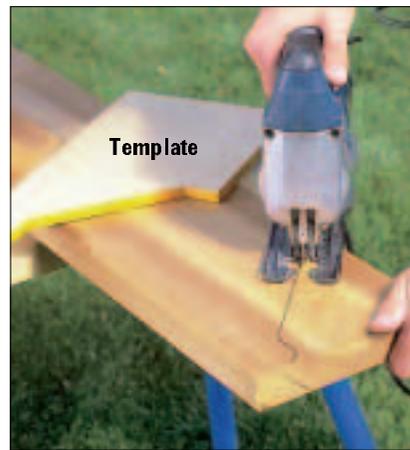
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and joists frame the deck nicely without being obtrusive. They look good and complement the house architecturally even if the canopy is folded back against the siding. The fabric panels slide out for storage in less than 10 minutes, leaving the rugged pergola to make its own off-season architectural statement.

Key design factors

We explored a number of pergola designs before settling on the dropped beam and decorative tails shown here. While the structure needed to be solid, we wanted to omit ugly exposed metal joist hangers. We also wanted to avoid toenailing the joists because toenailed corners are prone to splitting as the wood dries and shrinks. Our solution was to fasten the 2x8 ledger to each 2x8 joist with pairs of 3/8 x 5-in. lag screws. Then we secured the joists to the dropped saddle beam using decorative blocks.

To build a pergola that accommodates a canopy, the layout begins with the standard width of the canopy sections and tracks — or 67 in. After leaving room for the framing itself, this deck was able to support three canopy sections. The distance between the

ledger and the dropped beam determines the length of each canopy.

We wanted the footprint of the shelter to roughly match that of the deck itself, complete with clipped corners. The three posts for the saddle beam extend down through the decking and are secured to the lower support beam with carriage bolts. You can bolt the posts to the side of the beam below

the decking or toenail and strap them to the top of the beam. Don't attach the posts to the decking.

The posts and the upper saddle beam need to be parallel to the house for the fabric panels to fit properly. While the lower beam appeared to be parallel to the ledger, we discovered it actually was cocked about 1/2 in. By shimming or notching the lower ends

of the posts, we were able to get them plumb and parallel.

One of the biggest recent improvements to deck design has been the use of standoff ledger brackets that allow moisture to flow behind the ledger rather than settling between the ledger and the siding or between the flashing and the decking. The pergola is more open than the deck, but it still benefits

8 Lift the beam and the free ends of the joists simultaneously and rest the beam on support blocks for bolting. Note the temporary bracing.

9 Mark the Stratton bracket positions on the ledger to ease alignment, raise the joist assembly and slip the ledger into the brackets for bolting.

10 After checking the joist assembly for square, secure the free ends by mounting pairs of vertical blocks with deck screws between the beams.

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from a rot-resistant ledger detail. Rather than install the pergola ledger directly against the house sheathing, we mounted it in Stratton brackets that are bolted over the siding. That way we didn't have to remove the siding or install flashing. A squirt of silicone caulk in the bolt holes both lubricated and weatherproofed the hardware connections.

Creative assembly

The trickiest challenge when erecting this pergola is raising the overhead structure on a confined, elevated platform. You must join the joists to the ledger before the ledger is installed, but you can't raise the joists once the saddle beam is up.

As shown on the cover, Associate Editor Blake Stranz had a great solution. (Actually, we all thought the idea was a bit nuts when he first suggested it, but it worked like a charm.) First, Blake clamped the saddle beam in position and predrilled the through holes for the 7-in. hex-head bolts. The long bores must be perpendicular to the surface, so he used a simple wood-block alignment jig. Second, he clamped temporary support blocks beneath the forward beam before removing the beams.

When it came time to raise the roof, Blake and Managing Editor Larry Okrend

slipped the loose beam under the joists and raised it until it rested on the support blocks. Then they installed the bolts in the predrilled holes and added the outside beam. Once the beam was securely bolted, they raised the ledger end, slipped it into the Stratton brackets and secured it with bolts.

We built the structure with red cedar, which is relatively light. Blake and Larry only had to raise one end of the structure at a time, so weight was not an issue. If you were to use heavier pressure-treated lumber, you might want to have more help for the raising.

Securing the outer ends of the joists to the saddle beam was both an aesthetic and a structural challenge. In addition to avoiding unsightly metal hangers or straps, we also needed a mounting surface for the canopy brackets. The decorative braces achieve both ends beautifully. The split beam pins the braces and the braces pin the joists.

The saddle beam design also is ideal for supporting floating hangers. For instance, Larry suspended a large

hanging plant from a chain attached to a sliding T-shaped block that fit over and between the beams. He can reposition the plant as needed to catch the best sunlight or provide needed privacy.

On track

Cross members and tracks support the ShadeTree canopy. The cross members hold the fabric to prevent it from sagging side to side. The ends of the cross members have rollers that ride in H-shaped aluminum tracks. If you were installing the tracks without a pergola, the middle tracks would support two canopies.

The ShadeTree tracks are fairly forgiving. They fit into sliding extenders at the end brackets so you can achieve a

perfect fit, even if your wooden pergola structure is a little off. Considering that long spans of dimensional lumber tend to sag or twist, a little latitude goes a long way.

Prices for the ShadeTree retractable canopy system vary based on the type of fabric, the length of the sections and the number of sections. For example, a two-section, 10-ft.-projection canopy would cost about $400 in mesh, $500 in solid fabric and $600 in striped fabric. The powder-coated aluminum vertical support structure costs an additional $150 per section. The three 16-ft.-long solid-color sections we installed would cost about $1,000. The pergola lumber and hardware cost about $350.

1 Install the track-mounting brackets on the ledger board with screws and bolt the extenders to the brackets.

2 Mount the corresponding track brackets to the vertical braces above the saddle beam.

3 Slip the track over the extender and secure the outer end to the brackets (as shown).

4 Fasten the tracks to the extenders at the ledger end.

5 Install the retainers on the track at the saddle beam.

Retainer

6 Feed the canopy rollers into the tracks at the ledger, starting with the outermost cross member's handle end.

7 Secure the canopies at the house by lifting the hooks.

Hook
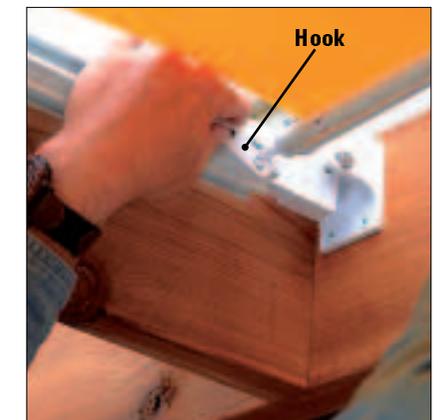
SOURCES
ShadeTree: MarvinGardens, (800) 894-3801, www.shadetreecanopies.com. The Stratton Bracket ($14 plus shipping and handling for package of four): P.A. Stratton & Company, (800) 768-8880, www.pastratton.com.