



Shade for your deck

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Shade for your Deck



A simple shelter for you and your deck—and your burgers!

by **Carl Hines**

You don't have to let the blazing sun or drippy weather drive you indoors. This simple covered pergola will keep you comfortable long after your neighbors with unsheltered decks have given up and gone inside.

We designed it for versatility and easy construction. Its 10 x 10-ft. size is large enough to accommodate a table and chairs but small and light enough not to require extra footings or deck framing. We recommend that your deck have at least 2x8 joists to ensure adequate strength. In addition, we made posts and beams from 2-by lumber because it's lighter than timbers and much easier to fasten together. You can expand the length and width about 25 percent without going to stronger components. We designed the fabric cover to be easily removable during cold months.

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One person can build and stain the entire structure in about six days.







1 CUT all the components to size (see Fig. A, p. 47, and the Cutting List, p. 48). Nail together the four corner posts (parts A1 and A2) with pairs of 3-in. hot-dipped galvanized box nails spaced 2 ft. apart. Fasten the ridge post (part G) with four nails to the cross beam 2x6 (part D1). There are three of these assemblies. Be sure the post is square to the cross beam.

2 POSITION five 2x2 blocks (part B2) on the 2x8 post beam member (for the layout, see Fig. A, Post Beam Detail). Fasten each block with a couple of nails. Be sure the blocks are flush with the bottom of the beam. Finally, stain all the parts and set them aside to dry.

We built our pergola from standard construction cedar because it's weather resistant and accepts stain well. Other rot-resistant wood would work as well. The total cost, including the fabric, was \$1,600. Allow about three weekends for completion, including staining.

A pergola like this looks best on a larger deck, one at least twice the size of the pergola. If you have doubts, mock up the corners with braced 2x4s; stand back and imagine the rest. If necessary, alter the slope of the rafters to match your house. (You'll have to recalculate the rafter angles and lengths.)

In this article, we'll walk you through the construction details, especially how to make solid connections to your deck. This is a surprisingly easy project to build; it mostly involves cutting the pieces and assembling them with nails

and screws. You should have confidence handling a circular saw and level, as well as simple carpentry experience. You can sew the fabric yourself or have an awning shop do it for you. Apply for a building permit; take a sketch of your existing deck structure as well as this plan for approval by the inspector.

To save time, stain the wood before assembly

First cut all the parts for the pergola, using the Cutting List on p. 48. Next nail together the four corner posts with pairs of 3-in. galvanized nails. Nail the three ridge posts to three 2x6 cross beam members (Photo 1). Then nail the 2x2 x 12-1/4 in. blocks to one side of two 2x8 post beam members (Photo 2). It's much easier and faster to stain all the parts before assembly. Let them completely dry before assembling.

Assemble a template to position the corners

Build a 10 x 10-ft. template out of 1x4s to help position the corner posts accurately (Photo 3). Screw this frame together so you can disassemble it later, and use the 1x4s to temporarily brace the posts. Shift the template around on your deck to help visualize the best location for the pergola.

Removing deck boards at the corner post positions can be difficult if they're nailed rather than screwed to the joists. If possible, get underneath the deck and knock the deck boards up with a heavy hammer. If you're lucky, the boards will pull the nails up with them. Most likely, however, the nails will pull through or split the boards, so you may have to replace several boards.

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3 CUT two pieces of 1x4, each 10 ft. long, and two pieces 9 ft. 5 in. long. Butt the shorter pieces between the 10-footers and drive 1-1/4 in. screws through corner blocks to connect the sides. Tack one side of the frame to the deck and then adjust the two diagonals are the same length. Fasten a 1x4 angled brace to hold the frame rigid and square.

Build the pockets for the four corner posts

Fasten blocking between the deck joists to support each corner post. Use the template to accurately locate the edges of the corner posts (**Fig. B**, p. 50). Mark the position of the 2x4 center that extends down between the deck joists (**Fig. B**). Make sure the 2x4 doesn't land on top of a joist. The one we show sits against the side of a joist.

Be sure to use joist hangers to ensure the strength of the blocks you're adding (**Photo 5**). It can be tricky finding room to swing a hammer to drive the hanger nails. In some situations, you may have better luck driving screws.

Although the 2x4 center slides into the pocket, the post's 2x6 components sit on top of the joist blocks (**Photo 6**), which support the weight of the pergola.

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Cutting List

KEY	QTY.	SIZE & DESCRIPTION
A1	8	1-1/2" x 5-1/2" x 96" corner posts
A2	4	1-1/2" x 3-1/2" x 114-1/4" corner posts; cut to pattern (see Corner Post Detail)
B1	4	1-1/2" x 7-1/4" x 144" post beams; cut both ends to pattern (see Post Beam Detail)
B2	10	1-1/2" x 1-1/2" x 12-1/4" blocks; sandwich set of five between 2x8 post beam members (see Post Beam Detail for layout)
C	1	1-1/2" x 7-1/4" x 144" ridge beam; cut to same pattern as post beam
D1	6	1-1/2" x 5-1/2" x 111" cross beams
D2	6	1-1/2" x 1-1/2" x 5-1/2" cross beam blocks; bolt to post beam (see Post Beam Detail for layout)
E	4	1-1/2" x 7-1/4" x 36" post beam angle braces; cut to pattern (see Post Beam Angle Brace)
F	4	1-1/2" x 7-1/4" x 36" cross beam angle braces; cut to pattern (see Cross Beam Angle Brace)
G	3	1-1/2" x 5-1/2" x 35-1/2" ridge posts; cut notch at top (see Ridge Post Detail)
H	20	1-1/2" x 5-1/2" x 84" rafters; cut to pattern (see Rafter Detail)
J	10	1-1/2" x 1-1/2" x 142" purlins; cut 30-degree angle at both ends

Buyer's Guide

Our awning fabric is from Sunbrella (800-640-3539, www.outdoorfabrics.com). The company will send sample swatches for \$1 each.

The **outdoor furniture** shown is available from Smith & Hawken (800-940-1170). The **grill** is available from Weber (800-446-1071).

Hardware

1 lb. of 3" corrosion-resistant deck screws
 2 lbs. of 3" (10d) galvanized box nails
 Thirty-four 3/8 x 4" galvanized lag screws
 Sixteen 3/8 x 5" galvanized lag screws
 Fifty 3/8" galvanized flat washers



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Assemble the pergola

4 REMOVE enough deck boards to access the joists at the corners of the template. Position the template exactly and mark the outside edge of the deck boards and joists. Then mark the position of the 2x4 post center (see Fig. B).

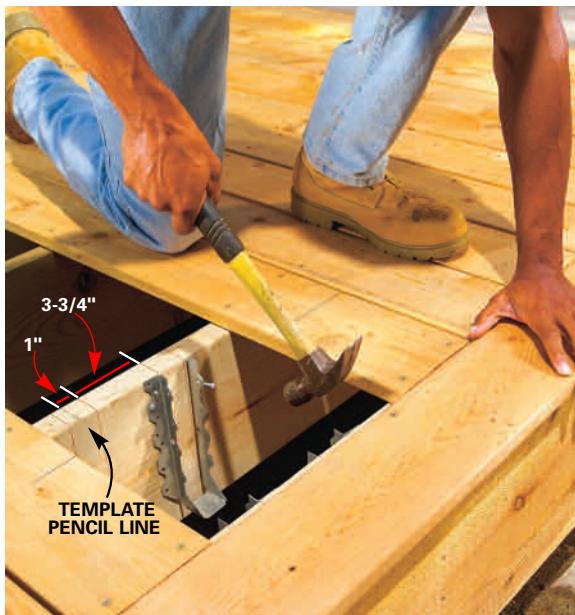
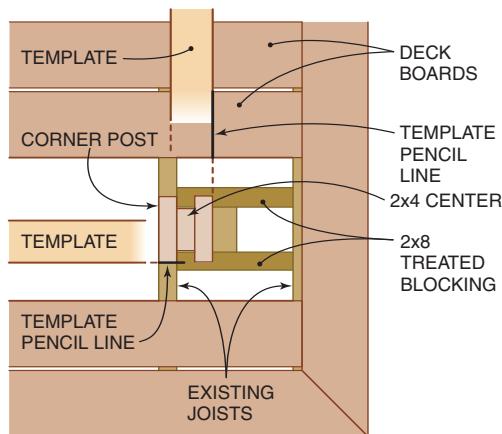
Drop the posts into the pockets and drive four 3-in. nails to secure each of them to the blocking (Photo 7). Don't worry if they seem wobbly; the rest of the pergola structure will stiffen them. Finally, plumb each post in both directions and secure with two temporary braces. Use the 1x4 salvaged from the template. Screw short pieces of 2x4 to the deck to anchor the bottom of the braces.

Next to go up are the two 2x8s that make up each post beam (Photo 8). Screw a temporary holder to one of the posts if you do this by yourself. A helper on a second ladder makes the job quicker.

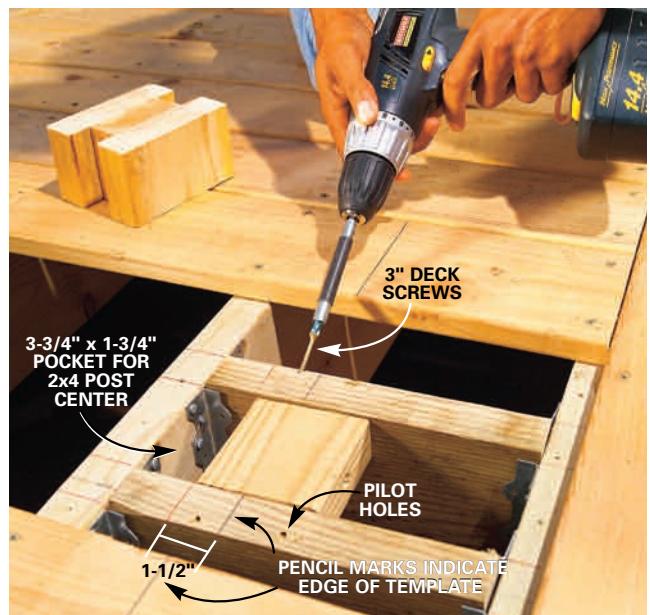
Use galvanized lag screws with flat washers to fasten the cross beam blocks to the side of the beams (Photo 9). Strength is critical here, so don't use deck screws or nails.

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FIG. B
POST
SUPPORT
DETAIL



5 LAY OUT the position of the center 2x4 and nail 2x8 joist hangers on each side of it. Nail or screw the 2x8 supports in place.



6 CUT a 3-3/4 in. long treated 2x4 block and screw it between the joist blocks to complete the support.



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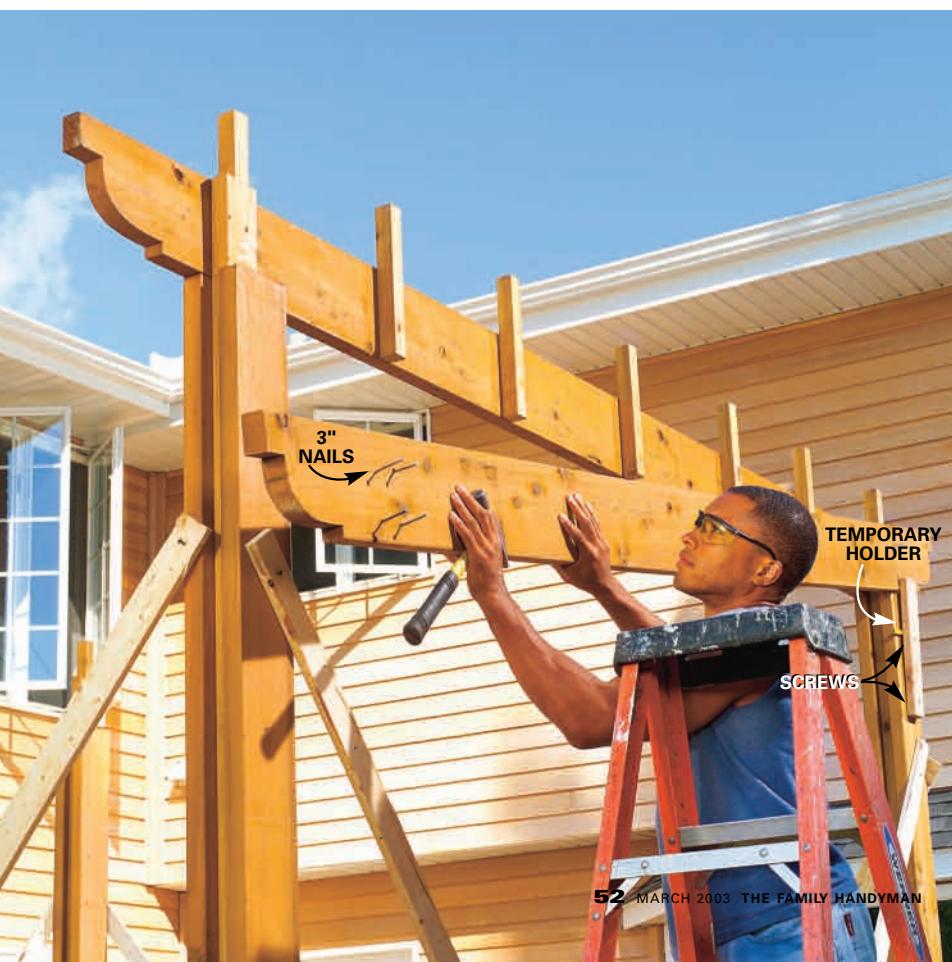


7 **DROP** the four posts into the joist pockets. Secure with four nails or deck screws. Plumb each post with a carpenter's level and brace in both directions.

Fasten the double 2x6 cross beams (**Photo 10**) into both the block and the beam (**Photo 10 detail**). Drill clearance holes to avoid splitting, and drive 3-in. deck screws. Drive two 3/8 x 4-in. galvanized lag screws through the outer 2x6 and the ridge post into the inner 2x6. This securely pins the ridge posts to both 2x6s.

The angle braces at each corner (**Photo 11**) slide between the two members that make up the beams. If the space is too tight for the brace to slide in, wedge open the space a bit. After the brace is in, remove the wedge. Make sure the bottoms of the two braces are even with each other at each corner. Drill clearance and pilot holes, and drive lag screws to secure them (see **Photo 11** for sizes and location). Now you can remove the temporary corner braces.

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8 **SET** the 2x8 beam with the 2x2 blocks onto the post's 2x6 shoulder and nail into place with four 3-in. nails. Position the second 2x8 and nail it into the posts. Finally drive two nails through the second 2x8 and into each 2x2 block.



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9 POSITION the three 2x2 cross beam blocks (part D2) to the inside of the beam. See Fig. A, Post Beam Detail. Drill 3/8-in. clearance holes through the 2x2s and 1/4-in. pilot holes into the beam; drive 3/8-in. by 4-in. galvanized lag screws.

Lay out the rafter positions on both sides of the ridge beam before setting it in place. It's a lot easier to do this while standing on the ground than on a ladder. Now set the ridge into the three ridge post slots (Photo 12).

Work from one end to the other setting the rafters (Photo 13). Make sure that each rafter sits 1-1/2 in. below the top of the ridge beam. Fasten all the rafters to the ridge beam first, then go back and fasten them to the post beams.

Starting at the ridge, mark out 16-in. spacing for the purlins. You don't need to mark out all the rafters, just both end rafters and the center one. Position the 2x2s on the layout marks and drive a single 3-in. galvanized nail through the purlin into both the end rafters and the center one (Photo 14). Next have a helper look down the length of the purlin from one end and sight it straight as you nail off the purlin at the rest of the rafters.

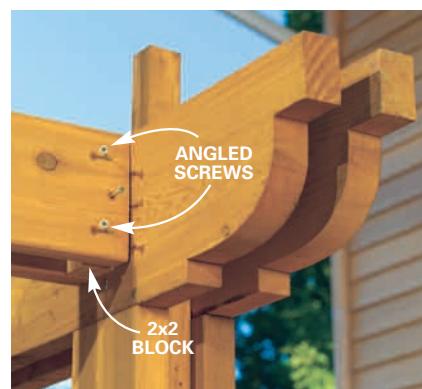
Install the canvas cover

We used a fabric manufactured specifically for awnings (see **Buyer's Guide**, p. 48). It's UV stable and rot-proof. Canvas is a less expensive choice, but it's not as long lasting. You'll have to sew four

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10 LIFT the 2x6 cross beam and ridge post into place and drive three screws at each end (see detail). Set the second 2x6 and fasten it at both ends. Predrill and drive two 3/8 x 4-in. lag screws through the outer 2x6 into the ridge post.





11 **SLIDE** the top end of the angle brace between the beam's two components. Drill clearance and pilot holes and drive lag screws to secure them. Remove the temporary braces.

12 **SLIDE** the ridge beam into the post notches and center it end to end. Drill clearance holes and drive three 3-in. deck screws through each post into the beam.

strips together to get the 12-ft. width. The sewing takes some experience and a heavy-duty sewing machine. If necessary, have a tent and awning company make the cover for you.

The fabric cover is 144 in. wide by 174 in. long with pipe pockets sewn in at the two bottom edges (Fig. C, p. 58). Make and attach three 1-in. wide by 10-in. long fabric straps on each side centered on the double rafters. Sew on Velcro strips to finish them.

Fabricate a 12-ft. length of 1/2-in. EMT conduit (metal electric conduit). It comes in 10-ft. pieces, so you'll need to cut it (use a hacksaw) to add a 2-ft. piece. Connect the two sections with a 12-in. piece of 5/8-in. diameter wood dowel. Apply polyurethane glue or construction adhesive to each end of the dowel, then slide half of it into each piece of pipe. Let the glue set overnight.

Now slide the pipes into the completed awning cover. The pipes make it easy to roll up the fabric.

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13 **SET** a rafter against the ridge beam, holding it 1-1/2 in. below the top edge. Drive two deck screws to fasten it. Fasten the bottom end of the rafter to the 2x2 block with two screws. Continue until all the rafters are in place.





14 **MAKE** layout lines every 16 in. along the top edge of the rafters, starting at the ridge. Center the 2x2 purlins over the rafters. Make sure they're on the layout lines and drive a 3-in. galvanized nail through the purlin into each rafter.

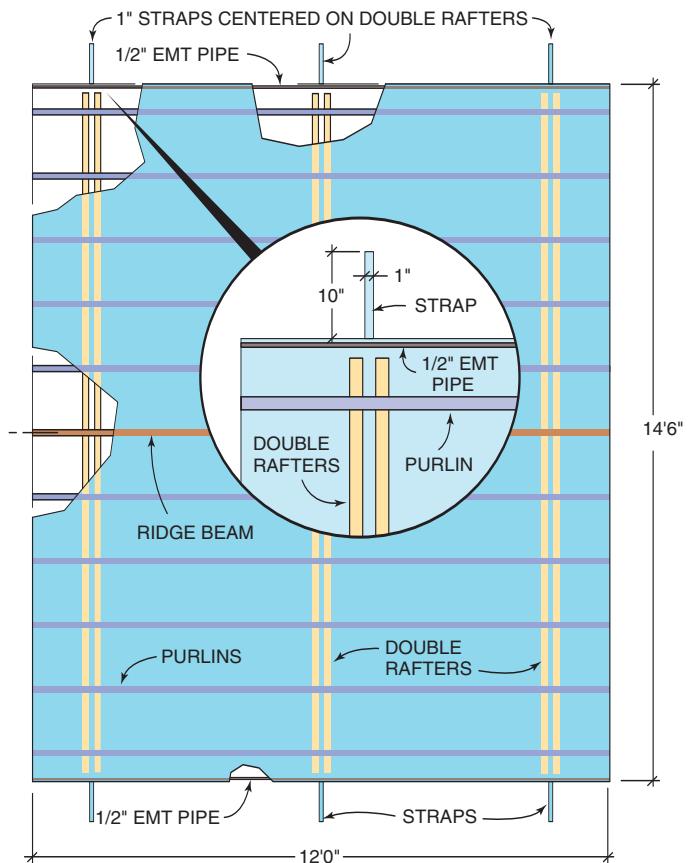


15 **UNROLL** the canvas over the top of the purlins. Wrap the straps over the partially driven nail and fasten it back on itself with the Velcro.



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FIG. C
CANVAS COVER



Start at one edge and roll it up with the finished side of the fabric showing.

We used 3-1/2 in. galvanized nails for the strap anchors (**Photo 15 detail**). Drill a clearance hole through one of the rafters; slide the nail through until its tip hits the second rafter. Then hammer it in. The Velcro strap wraps around the nail and sticks to itself.

Working from a stepladder, set the rolled-up cover on top of the rafters along one lower edge. Unroll it up the rafters to the top, then down the other side (**Photo 15**). 🏠

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Photography • BILL ZUEHLKE
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