



Victorian screen house

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VICTORIAN Screen House

Escape the bugs in style, whether you're entertaining friends or just hanging out

by Jeff Timm

W

hether it's the commotion of the house or the buzz of the bugs that's driving you crazy, this airy retreat is the perfect place to get away from it all. It's a modest size (8 x 14 ft.), but the tongue-and-groove vaulted ceiling with exposed rafters creates a spacious feel. The decorative detailing adds punch to the simple design, and it's not difficult to achieve. The posts are store-bought, and the brackets and rafter tails simply cut with a jigsaw.

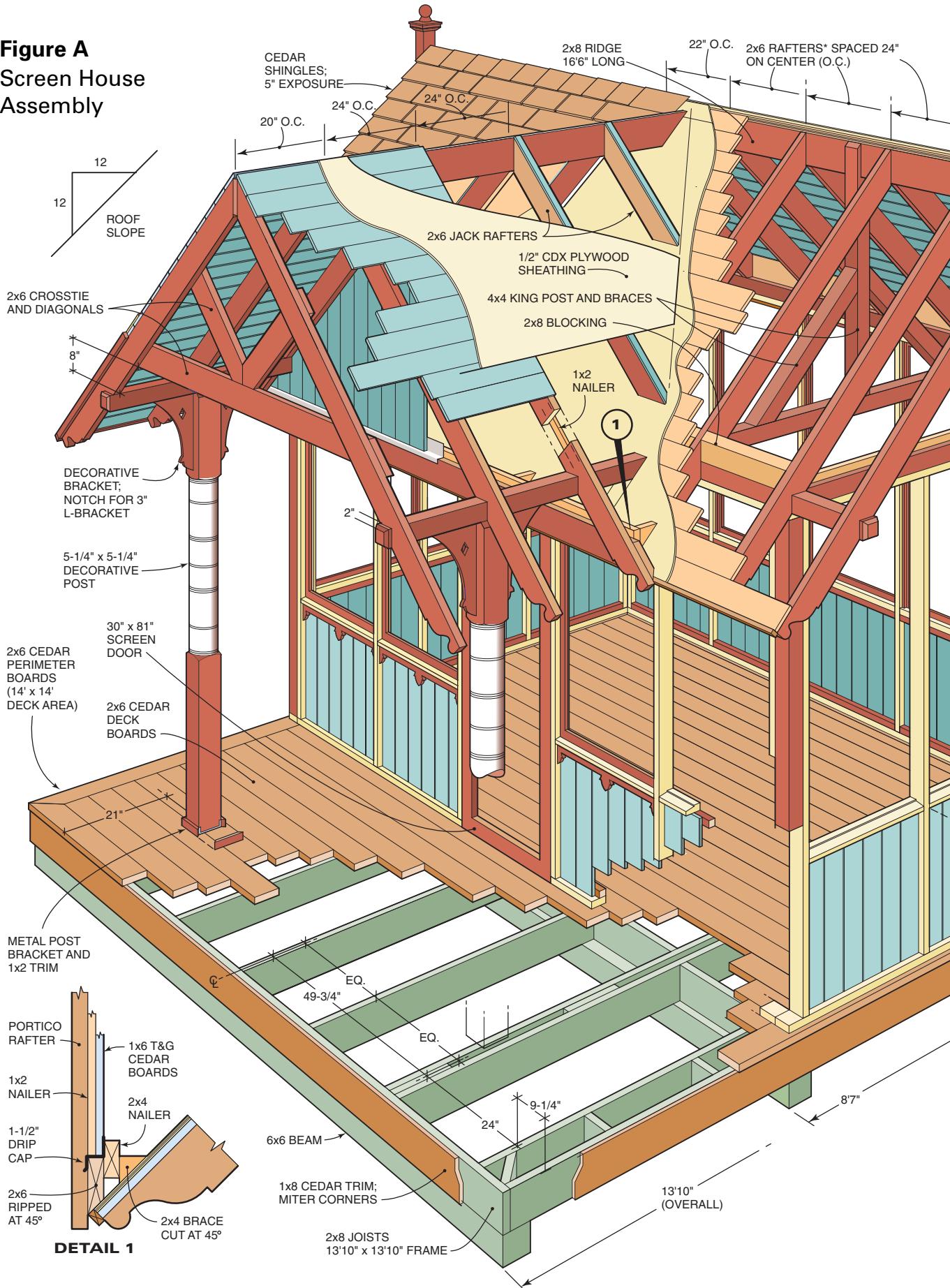
We designed this structure for easy construction. The walls are a modular design that is based on 30-in. wide openings. The roof has a 12/12 slope, which means every angle is a simple 45-degree cut. The porch roof and main roof are the same size, so all the rafters (except a few short rafters) are the same size. We special-ordered the screens and door (see Buyer's Guide, p. 60) to fit this design. And if you want to reduce the size of the project a bit, you can eliminate the porch roof and still have a handsome structure.

Use cedar for appearance and durability

We made this project almost entirely of clear (knot-free) cedar, from floor to ceiling and even the roof. Its natural resistance to decay and its ability to take a stain well ensure that your project will not only look good but last. However, the materials cost a hefty \$9,000. You could cut the cost of this project in half by using treated lum-

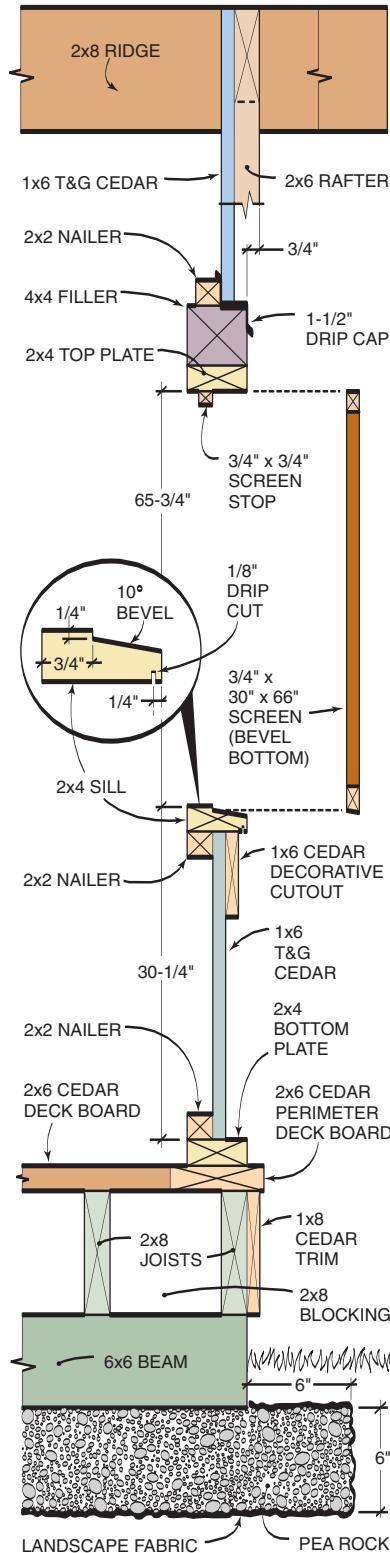
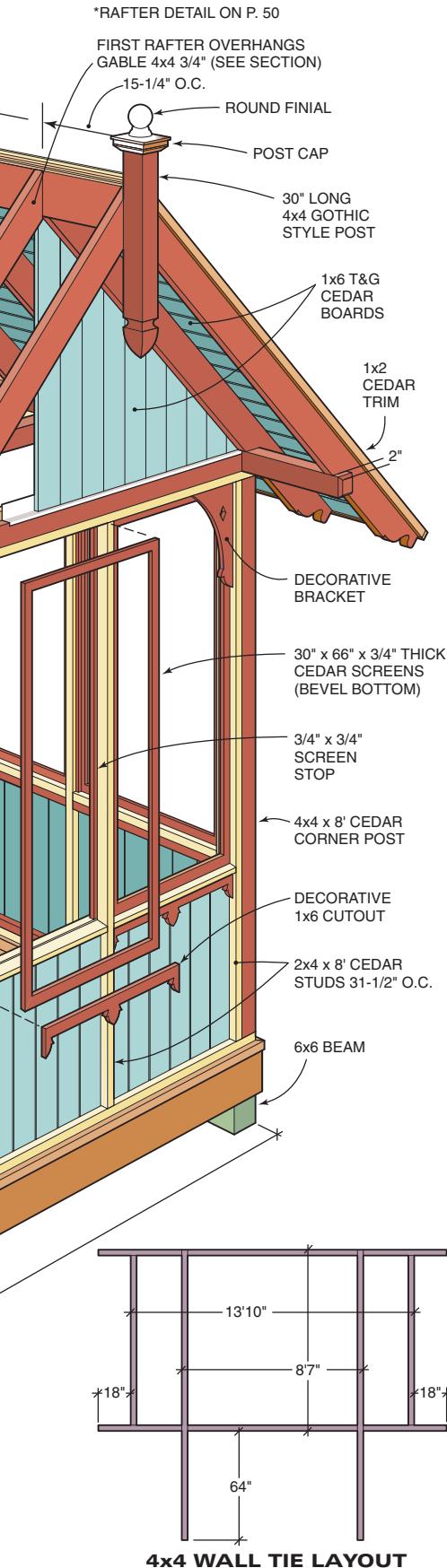


Figure A
Screen House
Assembly



DETAIL 1

Figure B
Gable Wall
Section View



ber for the deck and frame, a lower grade of 1x6 tongue-and-groove (t&g) cedar siding, and an asphalt shingle roof instead of cedar shingles.

We stained all the screen house wood with an oil stain before assembling. This seemed like a real chore at the time, but it was far easier than doing it later. We list the colors used in the Buyer's Guide (p. 60).

Building this project will take time. Break it up into manageable steps: First build the 14 x 14-ft. deck. Take a weekend to do the decorative cuts and another to stain the pieces. Then hit it hard with a helper for four to six days to put it all together.

This isn't a project for beginners, but if you've built a deck before, this is a great step-up project. Besides basic carpentry tools, you'll need a table saw and a couple of stepladders, one at least 12 ft. Although not essential, two sections of rented scaffolding (\$60 a week) make shingling much easier and safer.

A simple gravel bed provides a firm foundation

Mark out a 16 x 16-ft. area with stakes and string. Instead of digging deck posts into the ground, we decided to "float" the deck and screen house on a pad of gravel. If frost should knock it out of level, you can easily relevel it again. Excavate a pad about 8 in. deep, removing the topsoil. Get it roughly square and level, but don't fuss; you can tweak it later. Our site sloped 8 in. from one side to the other. Find a flatter site if your location slopes more than that. Otherwise you'll have to regrade or build a retaining wall.

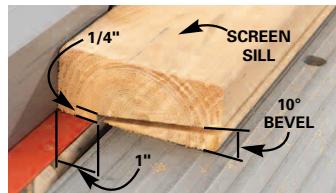
Fill the excavation with a 6-in. layer of 5/8-in. gravel (about 8 tons). This is a lot of shoveling, so have the gravel dropped as close to the pad as

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1 Frame the deck support system and joists using Figure A as a guide. Start the decking by laying two deck boards at right angles along two adjacent sides, mitering the corner. Lay the deck boards perpendicular to the joists. Keep them parallel by snapping a chalk line for reference about halfway across the frame.

2 Cut the wall parts to length (Figure A). Create the sills by cutting a bevel and a stop on cedar 2x4s with a table saw. **CAUTION:** You must remove the saw guard to make this cut. Use a push stick to keep your fingers away from the blade.

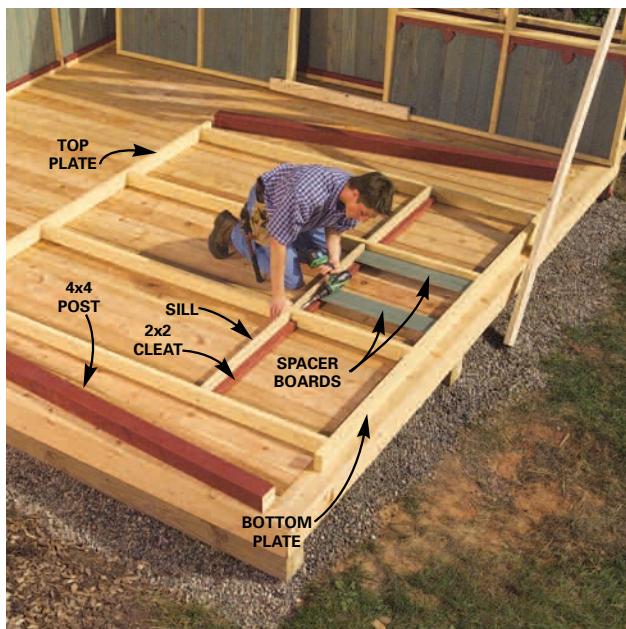


possible. Roughly flatten and level it with a long board.

Position the treated 6x6 beams (Figure A). Then nail together the outer frame (rim joists) of the deck. Square the frame by measuring the diagonals from corner to corner, shifting the corners until the diagonals are equal. Check the frame for level, adjusting it by adding or removing gravel under the 6x6s as needed.

Lay out the joist locations according to Figure A and nail the joists in place, working from the center to each end. The doubled joists and blocking stiffen the deck under the screen house. Also cut 45-degree angled blocks for the corners. Finally, nail a 1x8 cedar fascia around the perimeter, mitering the corners for a clean appearance.

3 Screw the studs to the top and bottom plates following the wall plan in Figure A. Then screw the screen sills and 2x2 cleats in place, using two 29-in. long siding boards as spacers. Toe-screw the center sill into the uprights from underneath. Screw the 4x4 corner posts into place.



Picture-framed decking

Picture framing gives the deck a more finished look—there are no raw cut ends. Begin decking with two perime-

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ter boards, mitering the corners and overhanging the trim by 1 in. (**Photo 1**). Screw them to the frame with 3-in. deck screws. Cut the first deck board to length and install it. Butt each deck board to the framed edge and trim the other ends evenly after they're all installed. Be sure you keep the decking straight. Anything out of line will be especially noticeable where the front wall of the house sits on the deck. Rip the last board to fit, trim the butt ends and then finish with the last two perimeter boards.

The modular design allows you to build the walls quickly

We designed the walls so that the screen openings are all the same size.

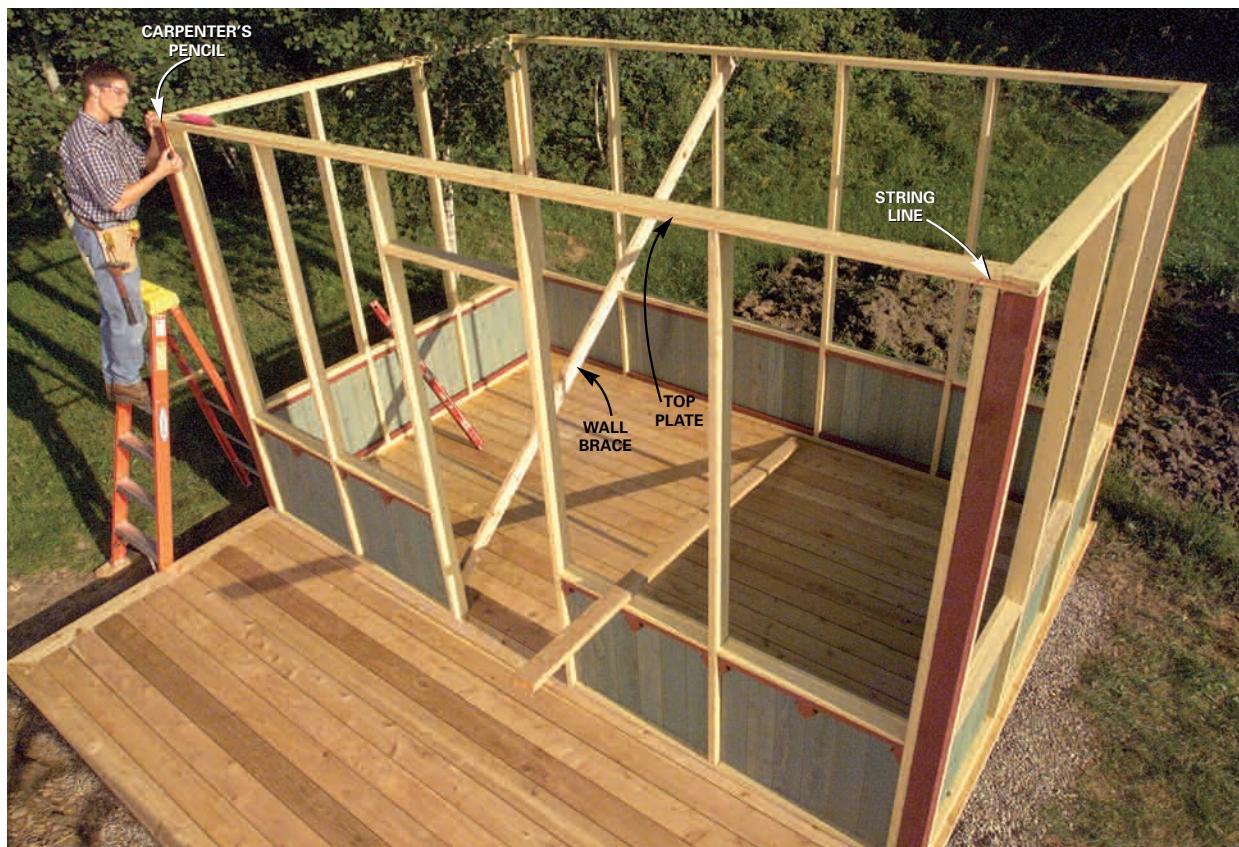
This simplifies wall construction. Buy good, straight lumber since everything is exposed. Assemble the walls using **Figure A** as a guide. We chose to fasten members with 3-in. deck screws, but 3-1/2 in. galvanized nails work just as well. If you use nails, be careful not to make hammer marks where they'll be seen. After assembling the front wall, cut out the bottom plate for the door and screw on a temporary brace until you fasten the wall to the deck (**Photo 5**). Assembling the 1x6 tongue-and-groove siding while the wall is down simplifies that task (**Photo 4**).

Get some help to tip up and plumb and brace each wall. Complete and stand the back and one side wall.

Then build the front and other side



4 Nail the 1x6 siding to the cleats. Drive 2-in. galvanized casing nails through the tongue and set them flush with a nail set. Trim the last board to fit. Apply construction adhesive to the "acorn" trim pieces, predrill with an 1/16-in. bit and secure them with three 2-1/2 in. galvanized siding nails.



5 Stand the walls and check for plumb with a level. Add temporary 2x4 angle braces if necessary. Screw the corners together and the bottom plate to the decking with 3-in. screws spaced every 16 in. Stretch a string line along each top plate to check for bows. Use a temporary 2x4 brace to push or pull the bowed wall straight.

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6 Cut and set the 4x4 wall ties into place (Figure A). Drive 3-in. screws up from the 2x4 top plates into the 4x4s every 12 in. to secure them. Bore a 1-in. diameter hole 1/2 in. deep, then a 3/16-in. pilot hole through the 4x4s at the four corners. Then drive 1/4 in. x 6-in. lag screws with washers through each.

7 Measure and cut the 4x4 king posts to length (Figure A). Mark the 1-1/2 x 7-1/4 in. slot and 45-degree bevel cuts in the top. Cut the bevels first with your circular saw. Then cut along the slot lines. Finish the cuts with a handsaw, then chop out the remaining pieces with a sharp chisel. Test-fit the notch with a 2x8 cedar board.



wall while you have the open space. Center the back wall on the deck 1-7/8 in. in from the edge. Sight down each bottom plate to make sure it's straight, then fasten it to the deck. Snap a chalk line to help align the front wall.

The top plates have to be straight as well to make rafter setting easier. Set a string line about 1/4 in. out from each end and run a carpenter's pencil along it to find bows (Photo 5).

Cedar 4x4s tie the walls together

The 4x4 wall ties substitute as a top plate and also extend beyond the walls to support the porch roof and roof overhang (Photo 6 and Figure A). We spaced the 4x4s that support the porch roof at the same width as the end walls (8 ft. 7 in.). This simplifies the roof framing by making all rafters the same length.

The two 4x4 king posts (Photo 8) are mostly decorative, but they also make it easier to set the ridge beam. Cut and fit them according to Photos 7 and 8. Before setting the beam, mark the rafter locations on both the 4x4 wall ties and the ridge beam. It's easier now than later!

Framing the roof is easier than it looks

Cut out the rafter tails using the pattern on p. 60. If the rafters aren't straight, orient them so any bow arches up. Then lay out the bird's-mouth (the notch that rests on the 4x4 top plates). Either mark and cut out the rafters using one as a pattern, or clamp them all together and cut a series all at once (Photo 9). This is an advanced cut; it takes a powerful circular saw, a sharp blade and a steady hand. Either way, cut one as a pattern and set it into place first to make sure it fits.

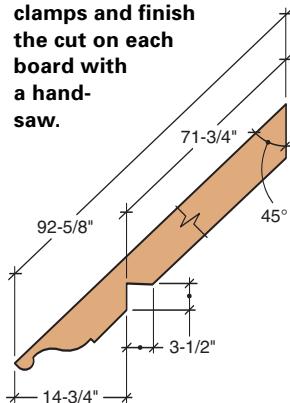
Setting the rafters is quick work. Set

Screen House

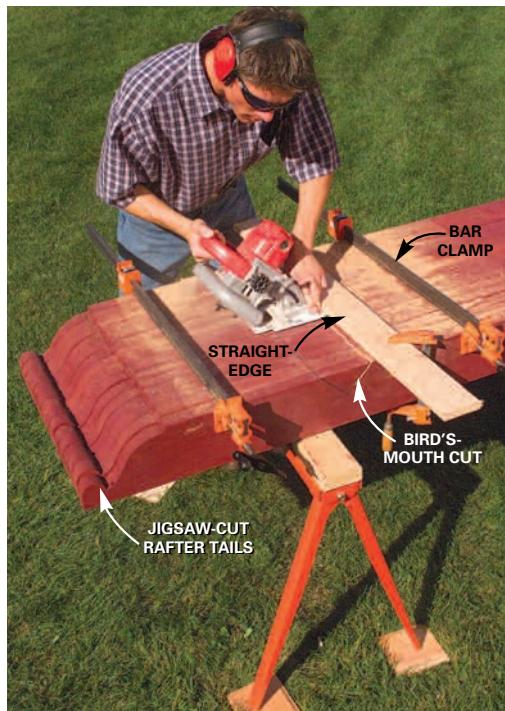


8 Center the king posts on the wall ties and toe-screw them into place. Plumb them and brace them with scrap 1x4s. Measure and mark the positions of the posts on the ridge beam (Fig. A), then slide the beam into position and fasten it with four 3-in. screws. Plumb in the other direction and brace (Photo 10).

9 “Gang-cut” your rafters by clamping them together and laying out a 3-1/2 in. deep “bird’s-mouth.” Clamp on a straightedge to guide the base plate of the saw. Cut both sides of the bird’s-mouth at a 45-degree angle, then remove the clamps and finish the cut on each board with a hand-saw.



RAFTER LAYOUT



the rafters in opposite pairs so that the ridge beam remains centered (Photo 10). Set the top of the rafter flush with the top of the ridge beam, and fasten it with two 3-in. screws. Pull the bird’s-mouth tight to the 4x4 and fasten it with three 3-in. screws. It goes faster if a helper works the ridge while you work the walls.

It’s easiest to enclose the gable walls before you put on the roof (Photo 11). Start the 1x6 tongue-and-groove siding at a bottom corner and work to the opposite end, checking for plumb every four or five boards. Marking and cutting them accurately along the top will leave a clean line along the ceiling on the inside.

Face-nail the boards and stain the nailheads to match. Fitting around the

Screen House

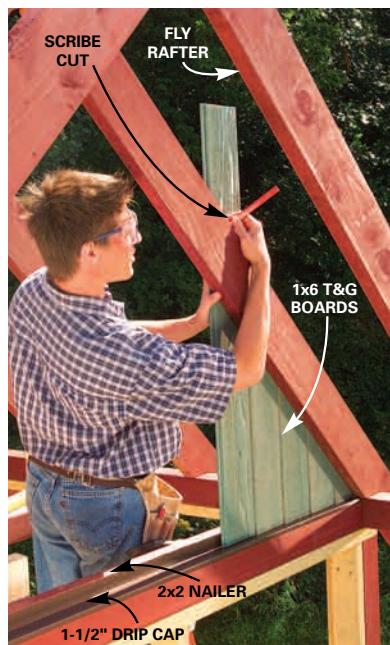


10 Screw the top ends of each rafter to the ridge with two 3-in. screws, following Figure A. Then predrill and toe-screw the rafters to the walls with three 3-in. screws. Set the rafters in pairs, and work from the wall ends toward the middle. Set the outermost (fly) rafters 2 in. from the 4x4 ends.

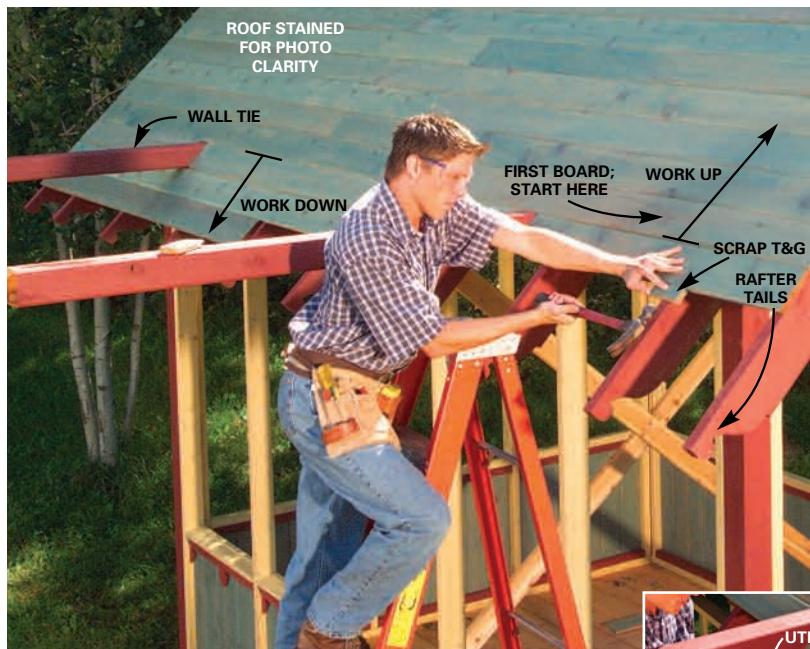
ridge is tricky; measure to fit then slide in the boards from underneath.

Install the ceiling from above

The 1x6 tongue-and-groove roof boards also make an attractive ceiling for the interior. Start your first board tight to the top of the 4x4 wall tie, cutting away a bit of the groove (**Photo 12**). Align it with a chalk line measured up from the rafter tails to keep it perfectly straight. We set the textured side to the interior, but you can install the smooth side down if you prefer. Although you won't see them from inside, it's best to stagger any butt joints for a stronger roof. Periodically measure down from the ridge to make sure that the boards are running parallel. You'll probably need to rip the top board to fit. Next fill down to the rafter tails, again ripping the final board to width if necessary.



11 Screw a 2x2 nailer to the 4x4 wall tie at each gable end. Tack on the drip cap and then cut and nail the gable boards to the rafters and 2x2s with 2-in. galvanized siding nails. Mark and cut each board to make a clean line along the rafter. It'll show.



12 Notch the grooved edge of your first 1x6 roof board, cutting it at a 45-degree angle with a utility knife so it fits over the two 4x4 wall ties. Nail it to each rafter with two 2-1/2 in. galvanized nails. Work your way up the roof, making sure to drive the tongues and grooves tightly together as you go. Then install the boards down from the first board, working them around the 4x4s (inset). Continue down to the rafter tails.



Adding a layer of plywood over the 1x6s stiffens the roof and provides enough thickness so the shingle nail tips won't poke through. First add the 1x2 fascia trim (**Figure A**) to the bottom of the rafter, setting it 1/2 in. higher than the edge of the 1x6. It'll cover the edge of the plywood.

Cut the plywood so the edge of each piece falls over a rafter and stagger the seams. *Snap chalk lines to mark the rafter positions for accurate nailing.* A stray nail will be visible on the interior. Cutting the plywood to fit around the wall ties is fussy work (**Photo 13**). Oversize the hole about 1/2 in. to make the plywood slide on easier. To prevent cracking the rafter tails, predrill and screw the plywood along the lower edge.

Building the front porch

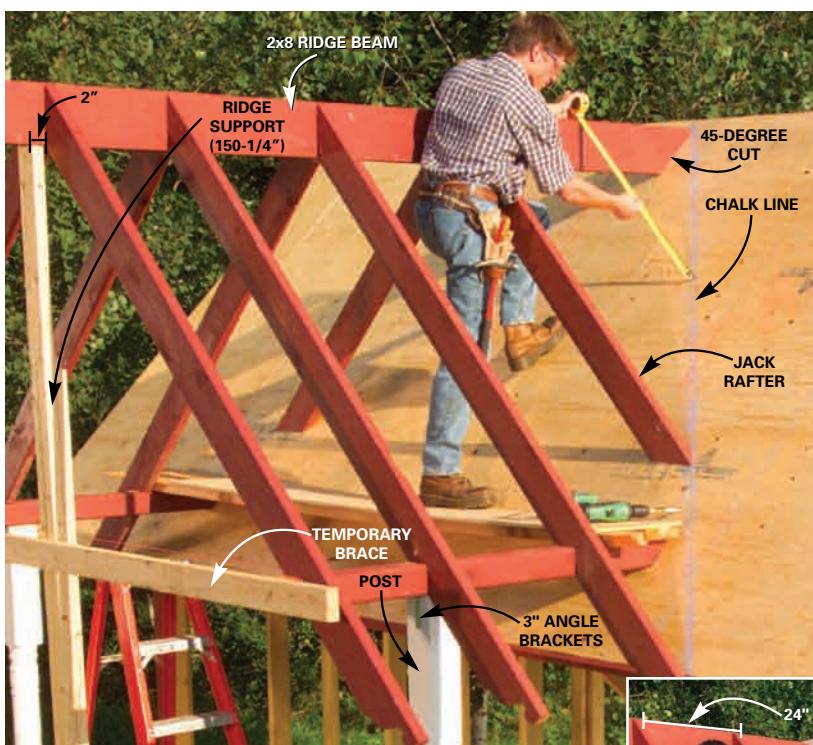
First set the porch posts. Measure and mark the post position on the deck (**Figure A**) and use a plumb bob to transfer the location to the 4x4 ties. We used a 4x4 metal post plate to slightly raise the post off the deck to prevent rot. Set the posts with two 3-in. metal angle brackets on top and screws through the plate into the decking on the bottom.

To prepare for setting the rafters, screw a temporary brace that connects the ends of the 4x4 wall ties. Make sure that the outside width is 8 ft. 7 in. Next set a temporary vertical support (150-1/4 in. long) centered and plumb for the ridge beam to rest on. Cut a 45-degree angle on one end of the ridge beam and leave the other end long. Center the ridge beam on the main roof, check it for level, then screw it into place. Fasten your rafters the same as you did for the main roof (**Photo 14**).

The short rafters that meet the main roof are called "jack" rafters. The compound angle you cut on the end that rests on the roof may be



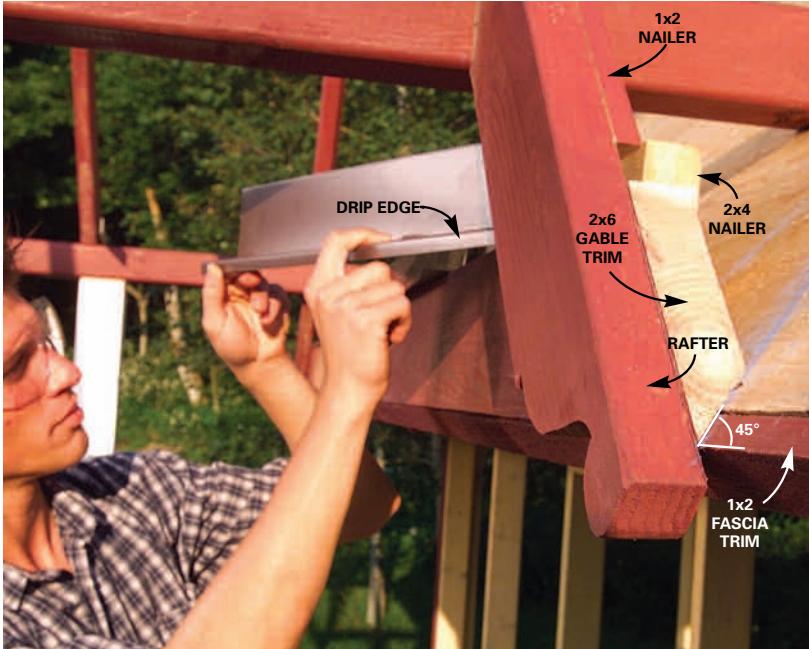
13 Mark out the location of the 4x4 wall ties on the 1/2-in. plywood roof sheathing, cut a square hole with a jigsaw and slip the plywood onto the roof. Nail through the plywood and 1x6s into the rafters every 8 in. with 2-1/2 in. galvanized nails.



14 Cut and install the ridge and first three pairs of porch rafters following the pattern shown in Figure A, then snap a chalk line from the end of the innermost rafter tail to the ridge. Measure and cut the jack rafters to length (they don't have to be exact). Cut the bottoms of the rafters at a compound 45-degree angle to sit on the roof and the tops at 45 degrees to meet the ridge. Space the rafters 2 ft. on center and screw them to the roof and ridge.



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15 Build the gable backer assembly as shown here and in Figure A. Rip a 2x6 at a 45-degree angle, trim the ends at a 45-degree angle to fit flush with the top of the rafters, and screw a 2x4 nailer to the backside (Photo 16). Screw a 1x2 to the top edge of the rafters and slip a drip edge on top of the 2x6. Then nail the gable 1x6 siding to the 2x4 and 1x2s as you did on the other gables.



16 Nail 1x6 tongue-and-groove boards to the rafters over the exposed part of the porch roof. Add 3/4 x 1-1/2 in. strips to the jack rafters to fur them out. Then measure for the plywood sheathing, cut it and nail it on. Tack up 1x2 fascia trim to cover all plywood and 1x6 edges.

tricky the first time. To cut it, tilt the base of your saw to 45 degrees and cut along a 45-degree angle line marked on the end of the rafter. If unsure, practice on a scrap first.

Photo 14 shows you how to set the jack rafters. When you fasten the lower end to the plywood, drive the screw in at an angle so the tip doesn't poke through the ceiling inside.

Before you remove the braces, screw a crosstie to the backside of the front set of rafters (**Figure A**). Also cut and attach the pair of decorative diagonals above it.

To install the 1x6 siding for the gable end above the door, use the assembly we show in **Photo 15** and **Figure A, Detail 1**. You don't really need the flashing in this protected area, but we included it to match the other gables. In addition, install blocks cut to a 45-degree angle spaced every 24 in. to keep the 2x4 nailer upright (**Photo 16**). Run the 1x6 siding as before, except that the top edge doesn't have to be exact because it won't be visible.

Only a small amount of the porch roof will be visible, so don't waste money and time running the 1x6 tongue-and-groove boards all the way across the porch roof. Instead, cover the exposed part and nail 3/4-in. furring strips to the other rafters (**Photo 16**). Then add the plywood sheathing.

Shingle the roof

Don't stop now! Once the plywood is on, cover it to make it weatherproof. Staple No. 15 roofing felt over all the roof sheathing. Then run an additional strip lengthwise down each valley. Now take a break.

Installing cedar shingles is enjoyable, rewarding work, but it's time-consuming. To speed up the job, rent a 1/2-in. crown pneumatic staple gun and buy a box of 1-in. long staples to

Text continued on p. 60

Screen House

Materials

Item	Qty.
FLOOR	
14' 6x6 pressure-treated beams	3
14' 2x8 pressure-treated joists	14
14' 1x8 cedar fascia boards	4
16' 2x6 cedar decking (to picture frame)	4
14' 2x6 cedar decking	30
3" coated deck screws	10 lbs.
2-1/2" stainless steel siding nails	1 lb.
5/8" pea rock	8 tons
WALLS	
8' 2x4 cedar studs	20
10' 2x4 cedar plates and sills	6
14' 2x4 cedar plates and sills	6
8' 2x2 cedar nailers	20
8' 4x4 cedar corner posts	4
Tongue-and-groove cedar for knee walls	225 lin. ft.
Tongue-and-groove cedar for gingerbread	38 lin. ft.
9' long 5-1/4" decorative porch posts	2
14' 4x4 wall ties	2
10' 4x4 wall ties	2
8' 4x4 wall ties	4
10' king posts and braces	3
10' long 1-1/2" drip edge	4
ROOF	
10' 2x6 cedar rafters	30
12' 2x6 cedar gable trim	1
12' 2x4 cedar nailer	1
8' 2x6 cedar crossties	2
8' 2x2 cedar nailers	2
14' 2x6 cedar blocking	2
18' 2x8 cedar ridge	1
10' 2x8 cedar ridge	1
Cedar 1x6 tongue-and-groove for gables	350 lin. ft.
Cedar 1x2 trim	92 lin. ft.
Cedar 1x2 nailer	18 lin. ft.
Cedar 1x12 brackets	30 lin. ft.
6' 4x4 Gothic fence posts	3
4x4 post caps	3
3-1/2" dia. round finials	3
Cedar 1x6 tongue-and-groove ceiling	990 lin. ft.
1/2" plywood roof sheathing	11 sheets
No. 15 roofing felt	2 rolls
Cedar shingles	4.5 squares
Cedar ridge shingles (12/12 pitch)	30 lin. ft.
1x1 screen and door stops	315 lin. ft.
10' pieces of brown aluminum valley flashing	3
10' long 1-1/2" drip edge	3
5x5 post plates	2
1/4" x 6" lag screws with washers	4
2-1/2" stainless steel siding nails	5 lbs.
2-1/2" coated screws	5 lbs.
Polyurethane construction adhesive	1 tube



17 Assemble the decorative post details and clamp the gable post to the rafter so the bottom of the cap is 3 in. higher than the ridge. Plumb it and secure with 3-in. screws from the backside of the rafter. Butt the 1x2 trim into it.



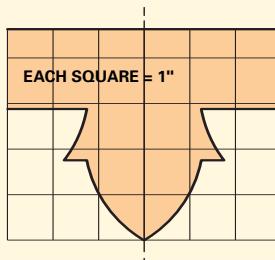
18 Staple No. 15 felt to the roof and nail valley flashing in the valleys, cut to overhang the roof edge by 3/4 in. Lay the shingles according to the directions that come on each package. We set the shingles at a 5-in. exposure and used a 1x2 as a guide to keep them even.

Screen Room

Decorative pieces

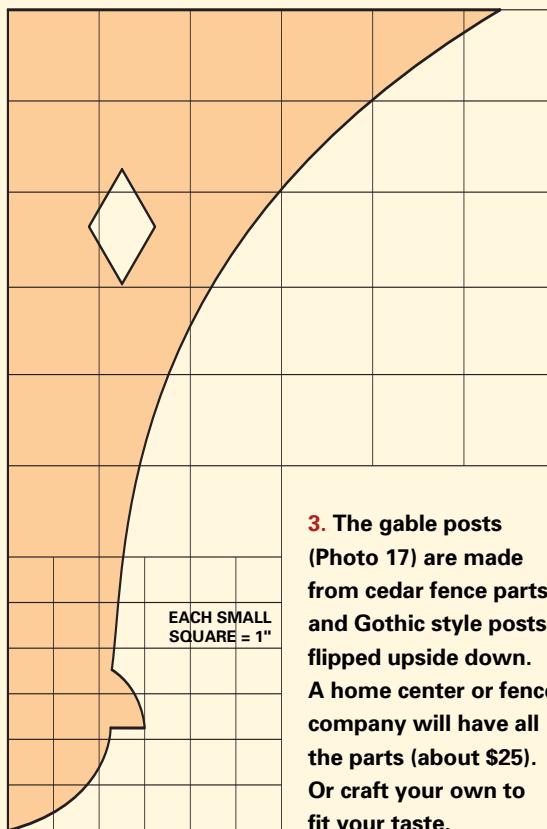
Rafter tails, brackets, gingerbread and gable posts are details that look like expensive custom pieces. But the fact is, they're easy to make. We've provided scaled templates you can enlarge on a photocopier and then cut out for full-size templates.

1. The acorn gingerbread is made from a 30-in. length of 1x6. Trace one acorn in the center and a half on each end. Make the cut carefully with a jigsaw; it's easy to snap off the tip. (I ruined several!) Construction adhesive will keep them from cracking once they're installed (Photo 4).



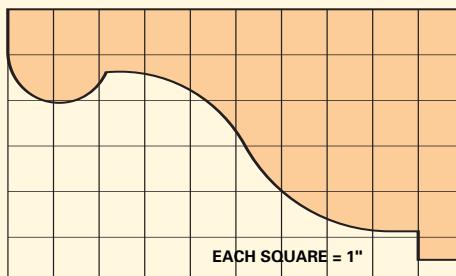
1. ACORN GINGERBREAD

2. Corner brackets are cut out of a cedar 1x12. Flip-flop the pattern down the length of the board to minimize waste. Avoid large knots. Predrill and nail the brackets with 2-1/2 in. galvanized casing nails in each corner of the screen house after you install the screens. Also set them on each side of the decorative post. Notch them slightly to fit around the metal angle brackets. Apply construction adhesive to the edge and toenail in place.



2. CORNER BRACKET

4. Rafter tails are easiest traced from a full-size template. Use our template to mark the first rafter, cut it out and then use that rafter as a pattern for the rest. Use your jigsaw and cut curves slowly to make clean, accurate edges.



4. RAFTER TAIL

fasten the shingles to the roof. Space the shingles 1/4 in. apart to allow for expansion and stagger the joints between shingles by at least an inch. Double the first row and let the edges overhang by 3/4 in. **Photo 18** shows you how to deal with the valley. For complete instructions, visit the Cedar Shake & Shingle Bureau's Web site at www.cedarbureau.org.

Setting the screens

We special-ordered our screens to save time and money (\$38 per 30 x 66-in. screen; see Buyer's Guide below). You'll need 15. Ask for a 10-degree bevel on the bottom to fit the tapered sill and order them painted. We painted ours, but it was time consuming. Nail 3/4 x 3/4-in. stops to the 2x4 uprights and top plate to secure the screens.

We also ordered a simple cedar screen door (\$140), complete with the hinges and latch set.

Finishing details

Although the drama in this screen house lies in its overall structure, several decorative details add more punch. Up alongside each king post we added 4x4 braces for better looks (**Figure A**). And to keep the bugs out, we nailed 2x6 blocking ripped at a 45-degree angle between each rafter on top of the 4x4s (**Figure A**). 

Buyer's Guide

Screens and door: Coppa Woodworking Inc., (310) 548-5332. www.coppawoodworking.com
Posts: Mad River Woodworks, (800) 446-6580. www.madriverwoodworks.com
Stain: Cabot, (800) 877-8246. www.cabotstain.com
* Barn red: semisolid
* Allagash: semitransparent
* Colonial yellow: semitransparent

Art Direction • DAVID FARR and MARCIA WRIGHT ROEPKE
Photography • MIKE KRIVIT
Technical Art • EUGENE THOMPSON