



Gazebo

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- **Solid construction—hidden steel fasteners**
- **Decorative trim—patterns provided**
- **Complex roof made simple with step-by-step photos**



Gazebo

Besides gracing the back yard with its splendor and calming presence, a gazebo is the perfect place to entertain. One look at this beauty and you'll be picturing it filled with family and friends, celebrating a graduation or even a backyard wedding.

We designed this 12-ft. dia. gazebo with plenty of eye-pleasing trim, from the pattern-cut rails that surround the seating area to the ball-shaped finial atop the cupola. Yet it's easy to build if you follow our special hints, tips, technical

illustrations and Cutting List.

You're no doubt wondering what this gem costs to build. Well, you could pay \$15,000 and let a contractor have all the fun, or you could build it yourself for about \$3,800. You can pocket the savings—or throw one *really* great party.



by **David Radtke**

This gazebo is builder-friendly

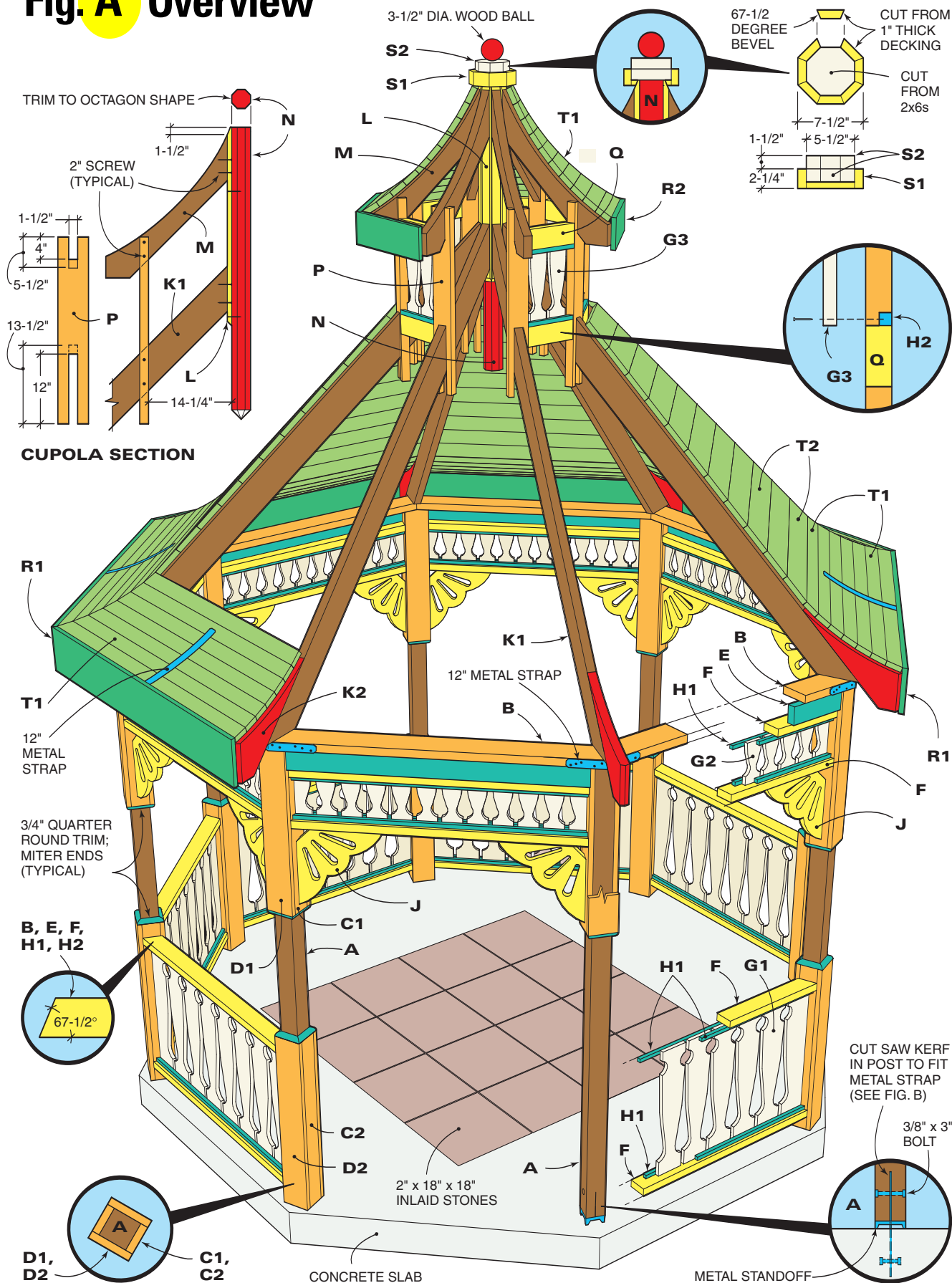
This project is not as difficult as it looks. Think of it as a series of several shorter projects with an end goal in sight for each. You can make all the decorative parts in your garage or shop (especially on rainy days). If you have several friends help you with the slab and framing (promise them anything), you can spread these two tasks over several weeks. A project like this would take two experienced carpenters nine working days from start to finish. An intermediate do-it-yourselfer who has built a deck should plan this as a whole summer project.

NOTE: You must have a site that slopes less than 4 in. over 12 ft. (any more than this will require some excavating).



Fig. A Overview

GAZEBO



Cutting List

KEY	QTY.	SIZE AND DESCRIPTION
A	8	3-1/2" x 3-1/2" x 102" posts
B	8	1-1/2" x 5-1/2" x 56-1/2" top plates
C1	16	7/8" x 3-1/2" x 31" cedar wrap*
C2	16	7/8" x 3-1/2" x 36" cedar wrap*
D1	16	7/8" x 5-1/4" x 31" cedar wrap*
D2	16	7/8" x 5-1/4" x 36" cedar wrap*
E	8	1-1/2" x 3-1/2" x 50-3/4" cedar headers
F	30	1-1/2" x 3-1/2" x 50" cedar rails
G1	56	3/4" x 5-1/2" x 27" balusters
G2	96	3/4" x 3-1/2" x 8" spandrel pickets
G3	16	3/4" x 3-1/2" x 13" cupola pickets (wilson pickets)
H1	280 ft.	3/4" x 3/4" retainer strips (cut to fit)
H2	16 ft.	3/4" x 3/4" retainer strips (cut to fit)
J	16	1-1/8" x 9-1/4" x 22-1/2" corner braces
K1	8	1-1/2" x 5-1/2" x 102" lower rafters
K2	8	1-1/2" x 7-1/4" x 24" rafter tail buildups
L	8	3/4" x 1-1/2" x 34" inner vertical rafter ties
M	8	1-1/2" x 5-1/2" x 32" cupola rafters
N	1	3-1/2" x 3-1/2" x 50" octagonal rafter hub
P	8	1-1/2" x 3-1/2" x 32" outer vertical rafter ties
Q	16	1-1/2" x 3-1/2" x 10" horizontal rafter ties
R1	8	7/8" x 8-1/2" x 6' lower fascia (cut to length)
R2	8	7/8" x 5-1/2" x 2' upper fascia (cut to length)
S1	1	See Fig. A
S2	2	See Fig. A
T1	300 ft.	1" x 2-3/4" lower roof sheathing (5/4 decking cut in two)
T2	320 ft.	1" x 5-1/2" upper roof sheathing (5/4 decking)

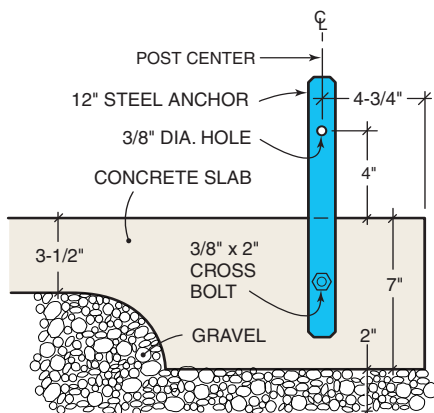
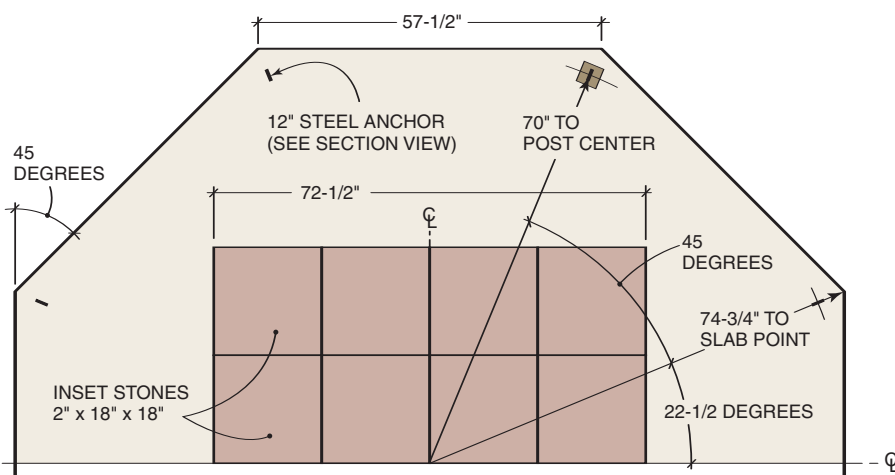


Fig. B
Concrete Slab and Paver Detail



The slab

You don't have to get the slab dimensions perfect, but the closer they come to it, the easier things will be later. If you hate doing concrete work, skip this section, photocopy it and give it to your concrete mason. A crew can do the work for about \$1,200 while you're out shopping for lumber or cutting parts (but you can cut the cost to a couple of hundred if you do it!). There's also an article in our May '00 issue on pouring concrete that'll fill in a lot of gaps in this subject area. (To order a copy, see p. 114.) Follow **Fig. B** closely if you decide to do it yourself.

Begin by driving a 2-ft. piece of rigid electrical conduit at the intended center of the gazebo. Drive

it in 18 in. Remove the sod with a rented sod cutter. You'll need to excavate a 9-in. deep area radiating out about 78 in. from the conduit. After that you'll set forms and put in a layer of 1/4-in. gravel to the dimensions shown in **Fig. B**. The idea is to have the outside foot or more of the slab thicker to support the weight of the structure.

Build your forms after carefully examining **Fig. B**. Set your circular saw at 22-1/2 degrees and cut eight 2x8 exterior forms with the short side measuring 57-1/2 in. Screw the forms together with 3-in. deck screws. Have a friend help you align the forms so the eight corners of the forms are all



G A Z E B O

the same distance from the conduit center. If these measurements are all equal, your slab will be a perfect octagon—get it as close as you can. Drive 3/4 in. x 2-1/2 in. stakes along the outside of the forms at each intersection, level the forms and screw the forms to the stakes.

Now build a square inner form for the patio inlay, 72-1/2 in. on each

side. Center it as shown and drive in the stakes on the inside of the forms and screw them together.

The slab will require about 1-1/2 yds. of concrete and four 10-ft. pieces of No. 4 rebar. Have plenty of help (at least three strong backs and two heavy-duty wheelbarrows). Wheelbarrow the concrete and dump it into

TIGHTEN THE NUT onto the carriage bolt. Temporarily brace the 4x4s if necessary. Be sure you have the standoff screwed to the posts before you mark and drill the hole.

1

CUT THE POSTS TO LENGTH and mount the aluminum standoff underneath. Transfer the hole locations in your steel anchors to the sides of the post.

Drill a 1-1/4 in. recessed hole followed by a 3/8-in. hole for the 3-in. carriage bolt,

washer and nut.



CONCRETE SLAB

18" x 18" PAVERS INSET

G A Z E B O

the forms, lay rebar 4 in. in along the perimeter, screed the concrete with a straight 2x4, then run the hand float over it. Set your anchors in at the locations shown in **Fig. B**. Wait till the concrete is firm (you should have to push hard to leave a thumbprint). Smooth it with a steel trowel, cover it with 4-mil clear plastic and let it set for two days. Keep kids and pets away.

SCREW THE 2x6 TOP PLATES to the 4x4 posts with 3-in. galvanized screws. If your posts are set properly, the top plates should all be the same length. Make any adjustments to ensure the posts will all be plumb. Use a level to plumb the posts and install temporary bracing (shown in Photo 7). Cut and install the post wraps C1 and C2 at this time.



Cut your posts to length and bolt them to the steel strap anchors

Make the anchors by cutting 12-in. lengths of 1/8-in. x 1-1/8 in. steel and boring 7/16-in. dia. holes into them as shown in **Fig. B**. You can find steel stock next to the threaded rod at your home center. For extra grabbing power for your posts, be sure you put a bolt and nut into the base before you push the steel into the concrete. The 6 in. of steel anchor above the concrete fits into a saw kerf (**Photo 1**) at the base of each post. Cut this kerf with a circular saw. The blade won't cut all the way through, so flip the post over to continue the cut in the other side. Make the kerf wide enough so you don't have to struggle to slip it over the steel anchor.

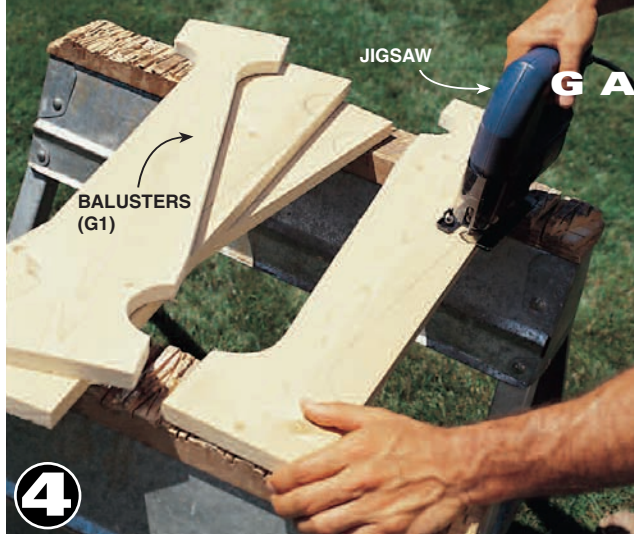
Before you mark your anchor hole

locations, screw the aluminum post standoff to the base of the post. These standoffs keep the post elevated for protection against rot. Mark the anchor hole locations as shown in **Photo 1**, then drill a 1-1/4 in. hole 1/2 in. deep on each side of the post, followed by a 3/8-in. hole all the way through. The 1-1/4 in. hole recesses the bolt head and nut to make room for the piece you'll nail over the post later. Grab a buddy to help set the post while you push the bolt through the hole and tighten it. Once all the posts are in place, cut the 2x6 top plates and screw them to the top of the posts with a pair of 3-in. deck screws. Plumb this framework with some temporary braces.

Give the posts some beef and dimension by nailing the cedar wrap to the tops and bottoms

Nail the 1x4 (C1 and C2) cedar wrap onto the posts first, then measure this width and rip-cut the wider 1x6 to fit (D1 and D2). Nail the wider wrap to the post with 8d galvanized casing nails. ▶▶





CUT THE BALUSTERS and the pickets from 1x6 and 2x6 material. See Fig. C. Sand, prime and paint the pieces before installing them.

Set up and cut out the gingerbread pieces

These ornate parts do take time, but there's nothing difficult about cutting them. Use the scale drawing in **Figs. C and D** to make a full-size template and trace the shapes onto boards. Don't think you have to cut all of them in one day. This is the kind of task you can chip away at by knocking off several pieces every day after work. Cut the lower balusters from 1x6 pine and the upper pickets (G2 and G3) from 1x4 pine. Use a circular saw for end cuts and a jigsaw for curves. Once you've finished cutting these pieces, sand the edges and prime and paint them.

Fig. D Bracket Pattern

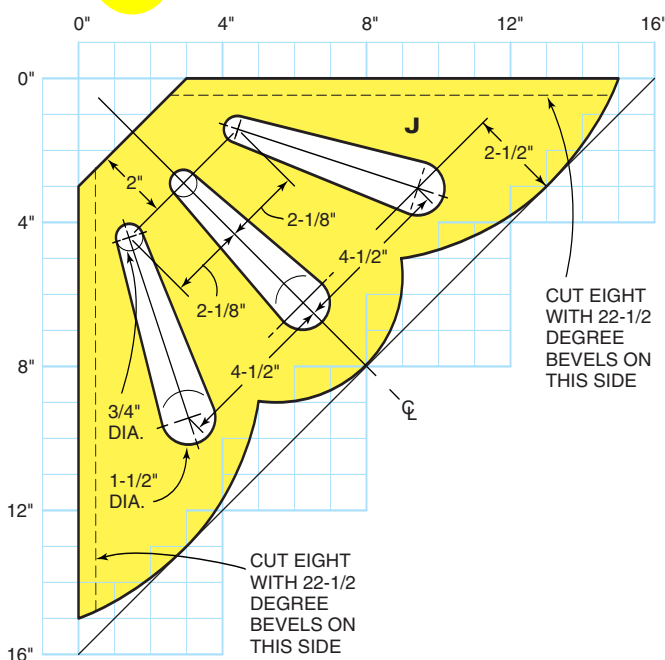
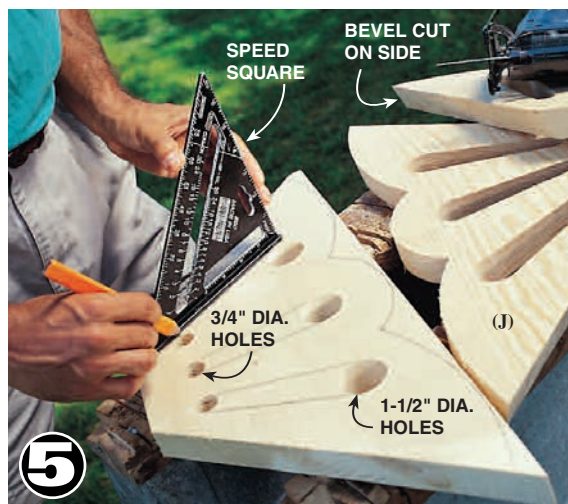
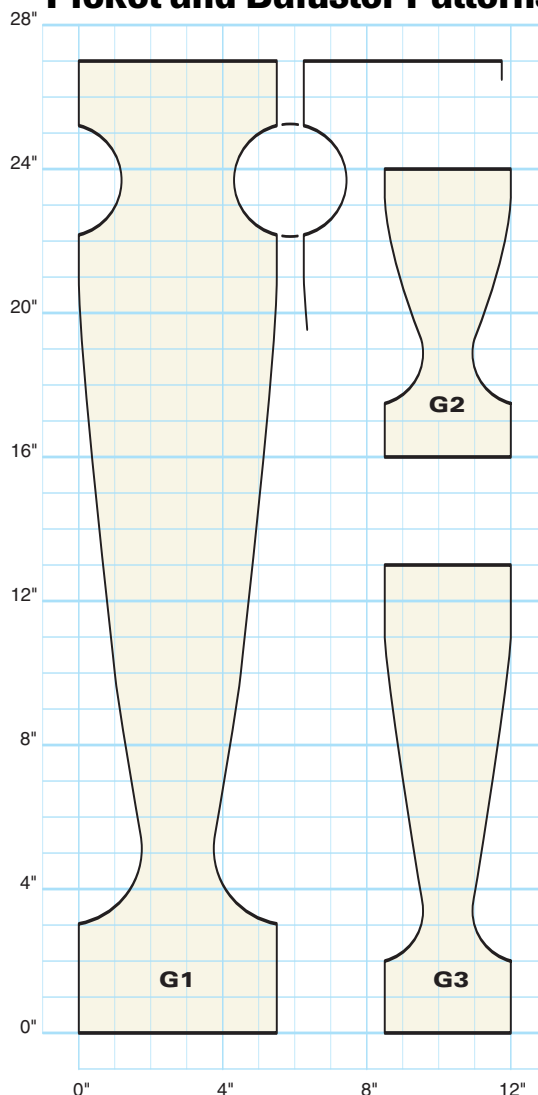


Fig. C Picket and Baluster Patterns



CUT THE 16 CORNER BRACKETS from 5/4 x 9-1/4 in. pine (which is 1-1/8 in. thick). Note that there are eight left- and eight right-hand pieces.



GAZEBO

Cut the corner braces (J) from 5/4 (1-1/8 in. thick) pine (**Photo 5**). After you cut the shape, bevel-cut one side with your circular saw set at 22-1/2

MITER AND SCREW THE RAILS AND HEADERS to the posts with 3-in. galvanized screws. Nail the balusters (G1) to the cleats, which are nailed to the cedar rails. Use 1-1/4 in. galvanized nails. A power finish nailer is handy here.

degrees. Keep in mind that there's a left and a right corner brace for each post. Prime and paint these as well. Nail the corner braces to the post and rail with 8d galvanized casing nails *after* you install the rails, lower balusters, upper pickets and all the cleats. Use 4d galvanized casing nails to nail the cleats to the rails.



7

SCREW UPPER BRACES to the top plates (B). These will help stabilize the structure as you assemble the roof. Be sure the posts are anchored with braces as well.

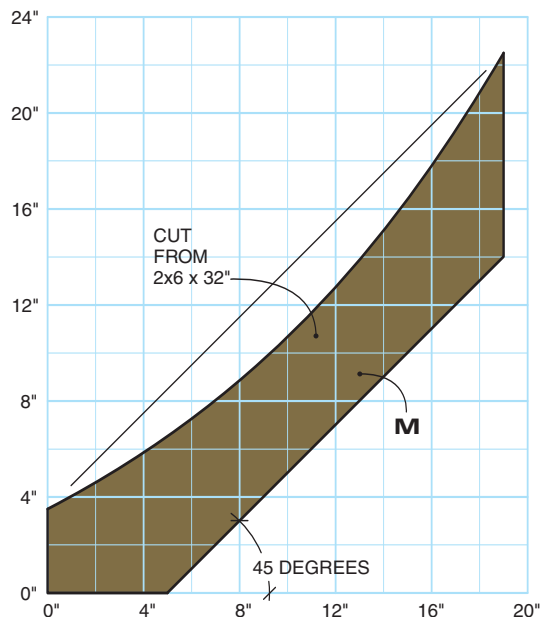
The cupola practically builds itself with this unique rafter system

Fig. E

Cupola Rafter



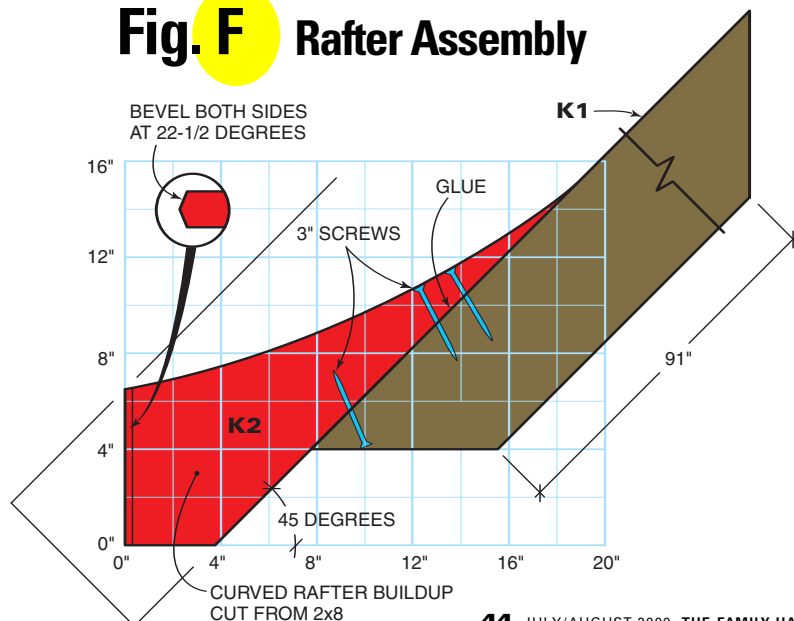
CUT THE CUPOLA RAFTERS from the template shown in Fig. E. Cut the rafters and the curved rafter tail buildups using the information in Fig. F.



Study **Figs. A, E and F** and **Photo 10**. Cut your lower rafters (K1) and screw curved rafter tail buildups (K2) to the ends of the lower rafter. Cut the 1x2 inner and outer vertical rafter ties (L and P). Notice that these 2x4 outer vertical rafter ties have slots cut in them to slip over the upper and lower

rafters. You can cut these slots with a table saw or circular saw, working from each end. First cut one side with multiple passes and then flip the rafter tie over and cut multiple passes from the other side. You'll get an angled slope at the end of the slot from the roundness of the blade.

Fig. F Rafter Assembly



SHAPE THE CENTER HUB (N) into an octagon. Measure in from each side about 1 in. and cut along this line with your saw bevel set at a 45-degree angle. The finished octagon should be about 1-1/2 in. on a side.

Assemble the rafter sections before hauling them to the roof

FASTEN EACH RAFTER SYSTEM to the center octagonal hub. Install opposite sides one after the other to maintain the shape of the octagon. ►►



NAIL THE ANGLED PLATES (see Buyer's Guide, p. 53) to the rafter and to the top plates to secure the rafters to the structure.



NOTE: DON'T DO THIS ON A WINDY DAY

10

ATTACH TWO OPPOSITE RAFTERS to the center hub. Then grab a partner and carefully walk the assembly up to position. See Photo 11 for nailing detail.

RAFTER ASSEMBLY SCREWED TO CENTER HUB

TEMPORARY BRACE

RAFTER ASSEMBLY SCREWED TO CENTER HUB



13 **SCREW THE HORIZONTAL RAFTER TIES** to the sides of each outer vertical rafter tie.



14 **NAIL THE LOWER FASCIA (R1)** to the rafter tail ends. Miter the ends with the saw set at 22-1/2 degrees.



15 **NAIL THE ROOF DECKING** to the rafters with 8d nails. Be sure to screw (use 3/4-in. screws) the steel strap to the lower roof boards for extra support. The strap ties the narrower boards together to prevent sagging.

STARTER COURSES ARE RIP-CUT TO MAKE THE CURVE

FASCIA BOARD

Lay out the rafter parts (not including the center octagonal piece N) on a large flat area like a garage floor or a driveway (look at the upper left diagram of **Fig. A**). Fasten the upper and lower rafter to the 1x2 (L) with 2-in. screws. These rafters run parallel, with a 14-1/2 in. space between them. Next screw part P into the sides of the upper and lower rafter so that it's parallel to part L. Build the rest of the assemblies and then mount a pair to the center hub (N; see **Photo 9**). Follow **Photos 10 – 12** to mount the rafter assemblies to the top plates.

Deck the roof

Cut your lower fascia from 1x10 cedar. Hold it 7/8 in. above the ends of the rafters so your roof decking will be flush with the fascia.

Rip 5-1/2 in. decking in half for the first seven courses so they'll be able to bend around the lower curved section. Cut each end of the decking at 22-1/2 degrees for the first course and change the angle slightly until you finally reach about 16 degrees for the rest of the full-width courses.

Shingle the cupola first



16 **SHINGLE THE CUPOLA** before shingling the lower roof. Otherwise, you'll damage the lower shingles when you go up and down.

There are a few things you need to know about using the Carriage House Shingle roofing material. First of all, these shingles are heavy, and a bit tougher to work with than ordinary asphalt shingles. They also cost about twice as much, but we thought the finished look was well worth it. Don't buy the special cap shingles for the ridges; full cap shingles will look out of place. Instead, buy a matching color of ordinary asphalt shingles. You can cut these to fit the width and proportion of this small structure.

At the cupola where the surfaces are all curved, you'll need to remove the top one-third of each shingle to get it to lie flat. The cap over the seams should be cut narrower and shorter to follow the concave curve. Another thing to remember for the lower section: The cap shingles should be full width, but the length on the bottom four rows of cap needs to be cut down several inches to make the curve. ►►

GAZEBO

Painting your gazebo

Prime and paint if you please, but keep in mind that painting the gazebo means a lot of prep and repainting work in the future. It's best to paint just the gingerbread features as accents, and then seal the unpainted parts with a brush-on oil sealer. I'd recommend applying the oil first, then painting the next day. Don't bother oiling the underside of the roof. Because it's out of the weather and direct sun, it'll look fresh for years to come. ►►



SHINGLE EACH LOWER ROOF SECTION, then move to the opposite side. Keep the exposure consistent from side to side by measuring as you go.



Buyer's Guide

The following three products are available at most home centers and hardware stores. If you need help finding them, call Simpson Strong-Tie at (800) 999-5099 or check out its Web site at www.strongtie.com.

- The steel straps at the top plate and on the roofing are Simpson No. LSTA12.
- The angles for the rafter holddowns are Simpson No. A23.
- The standoffs are Simpson No. APS4.

Carriage House Shingles are made by CertainTeed. Call (800) 345-1145 to find a dealer near you.

Savannah shingles also are decorative asphalt shingles and are made by Georgia-Pacific. Call (800) 284-5347 for a dealer near you. Or check the Web at www.gp.com.

Shopping List

DESCRIPTION	QTY.
4x4 x 10' cedar (posts)	8
2x6 x 10' cedar (top plates)	4
1x4 x 14' cedar (wrap)	7
1x4 x 8' cedar (wrap)	1
1x6 x 14' cedar (wrap)	7
1x6 x 8' cedar (wrap)	1
2x4 x 10' cedar (rails and headers)	20
1x6 x 14' cedar (balusters)	10
1x4 x 8' cedar (pickets)	11
1x6 x 10' cedar ripped (3/4" strips)	6
5/4 x 10 x 8' cedar (corner braces)	4
2x6 x 10' cedar (rafters)	8
2x8 x 8' cedar (rafter buildups)	2
1x2 x 12' cedar (parts L)	2
2x6 x 8' cedar (cupola rafters)	3
4x4 x 5' cedar (octagonal hub)	1
2x4 x 8' cedar (outer ties P)	3
2x4 x 14' cedar (horizontal ties Q)	1
1x10 x 12' cedar (lower fascia)	4
1x6 x 8' cedar (upper fascia)	2
5/4 x 6 cedar decking 10-ft. lengths	50
Shingles (asphalt shingles)	3-1/2 squares
15-lb. roofing felt	1 roll
Roofing nails	10 lbs.
Simpson straps, No. LSTA12	16
Simpson angles, No. A23	16
Simpson standoffs, No. APS4	8
Joist hanger nails (galvanized)	5 lbs.
1-1/8" x 1/8" x 8' steel (anchors)	1
3/8" x 3" carriage bolts	8
3/8" x 3" hex bolts	8
3/8" nuts and washers	16
6d galvanized casing nails	5 lbs.
8d galvanized casing nails	5 lbs.
4d galvanized casing nails	5 lbs.
8d galvanized common nails	5 lbs.
Hook blades for shingle cutting	3
3" galvanized screws	5 lbs.

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 Photography • BILL ZUEHLKE
 Illustrations • GENE THOMPSON
 Project Design • DAVID RADTKE



Given the scope of this project, you'd expect it to take an arsenal of carpentry tools—not so

Here's what you need to do the concrete base:

- **Tape measure**
- **String line**
- **Sod cutter** to remove the turf
- **Shovel** to level the ground
- **Circular saw** to cut the forms
- **Screw gun**
- **Sledgehammer** to drive the stakes
- **Level** to even the forms
- **2x4 screed** to even the concrete
- **A hand float** to smooth the concrete
- **A steel trowel** for final finishing

Here are the tools you need to build the gazebo:

- **String line**
- **Tape measure**
- **Wrench set**
- **Drill**
- **Circular saw**
- **Jigsaw** (with lots of blades)
- **Framing square**
- **12-in. Speed square**
- **Hammer**
- **Screw gun**
- **Utility knife** (standard blades and hook blades)
- **Power miter saw** (optional)

