

Arbor & Gate

This woodworking project will make a grand entrance. The classic style of the curved arbor and gate suits the architecture of most homes and provides a striking entry into your garden or side yard. Built and installed separately, or combined for the full effect, both projects employ a number of techniques you may not have tried before. The use of patterns is covered in this project. Lowe's is happy to provide this information as a [service](#) to you.



Make a grand entrance for your home.

Arbor Instructions

General: Unless otherwise instructed, countersink screws, set nails and fill holes. Clean excess glue from wood surfaces per the instructions on the glue bottle.

Step 1: Lay out the arch assembly guide, then lay out and cut the long and short arch segment patterns.

a. Using a trammel stick or beam compass and a protractor or angle guide, lay out the entire arch on the 4x8' sheet of 1/4" plywood per Figure A.



Good idea: If you need a longer beam compass to draw your curves, substitute a 1/2" dowel, rod or tube for the beam that came with the compass.

b. Lay out the long and short arch segment patterns on the hardboard sheet per Figure A.

c. Cut out the long and short arch segment patterns with a circular saw and a jigsaw. Make patterns as precise as possible and sand edges for a smooth fit.

Step 2: Make the arch segments.

a. Lay the segment patterns on a (12') 2x12 per Cutting Diagram and trace patterns. Avoid knots and defects if possible.

b. Cut out each arch segment.

(1) Use a jigsaw to rough out each arch segment, cutting to within about 1/8" of the pattern lines.

(2) To do the final trimming, use a router with a collet and a straight-cutting bit. Temporarily screw the 1/4" pattern to the rough-cut blank, so that it acts as a template for the collet.



Good idea: You can use a flush trim bit to cut from a template mounted below the work. Otherwise, use a pattern bit with the bearing above the cutter for a template mounted on top.

Step 3: Construct the arches.

a. Place the first layer of arch segments (three long segments) on the arch assembly guide per Figure A. Check carefully for fit and cut or sand as needed to obtain the correct alignment. Temporarily secure the segments to the plywood assembly guide with mounting tape, making sure that the ends are butted tightly together.

b. Test-fit the middle layer (four short arch segments) on top of the first layer, with the end joints staggered as shown. All segments should lie flat on each other. If a segment is not flat, cut another to replace it. When a good fit is obtained, use Gorilla Glue and several 2 1/2" screws per segment to secure these arch segments to the first layer. Again, make sure the ends are butted tight.

c. Fit another layer of three long arch segments to the middle layer; secure with Gorilla Glue and screws.



Good idea: A polyurethane glue, such as Gorilla Glue, needs moisture in order to cure. You can dampen one mating surface using a plastic spray-bottle set to release a fine mist.

d. After the glue sets, remove the first arch assembly and repeat Steps 3a through 3c for the second arch.

e. After the glue has set on both arches, dress the inside and outside curved edges of each arch using a belt sander with a 40-grit belt. Fill all holes and gaps with exterior-grade wood filler. Use the belt sander also to dress the flat faces of each arch. Finish sanding the arches with 80-grit, then 120-grit.

Step 4: Construct the columns.

a. Rip the (8') 2x6 stock for the column struts to 5 1/4" wide. Remove a small amount from each of the edges to create a square corner at each edge.

b. Cut the struts to length.

c. Set one column strut flat on your workbench. Check the board ends for the orientation of the annual growth rings and place the bark side (convex side of rings) down; this will help prevent cupping at the edges. Apply Gorilla Glue to the top face of the strut, then place the center strut on top of the first strut and secure with 2 1/2" screws.

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d. Attach a third strut, bark side out, to the center layer, using Gorilla Glue and screws as before.

e. Repeat Steps 4a through 4d for the three remaining columns.

f. After the glue has set on all columns, use a sander to dress the columns so that all the surfaces and edges are smooth and flush.

Step 5: Install the columns.

a. The site chosen for the arbor should be reasonably flat and level. Make sure no utilities run under the arbor site. (Most municipal areas have a toll-free number homeowners can call to have the area checked for underground utilities and marked before digging; the service is usually free, but you are responsible for contacting local utility providers to request it.)



Check for underground utilities before digging. Before you begin any excavation (that means even digging a hole), you've got to call and check for underground utilities. This isn't just a good idea, it's the LAW. The North America One Call Referral Service at 1-888-258-0808 connects you to a national directory of utility companies.

b. Lay out the arbor column centers and mark with small stakes to create a 72"x34" rectangle.

c. Dig a posthole and set the first column on a layer of crushed rock, per Figure B. Use a level to check for plumb, then secure temporarily with stakes and braces. Mix concrete according to the manufacturer's instructions and pour it around the column; use a trowel to slope the concrete away from the column.

d. Measure the width of one of the arch assemblies, from outside bottom edge to outside bottom edge. Use this dimension to space the columns for the first arch. Cut a scrap 1x4 cleat to this length to help properly space the columns.

e. Dig a second posthole and dry set the second column. Check that the top ends of the columns are level with each other; adjust as necessary by adding more crushed rock to the hole (or digging the hole slightly deeper). Use the 1x4 cleat from Step 5d to align the columns at the correct distance. Plumb the second column; place a flat, straight board against the two columns' faces to check that they are in line, then secure temporarily with braces and stakes. Mix and pour concrete into the posthole.

f. Set the other pair of arch columns in the same manner. Cut two 1x4 cleats 34" long to aid in spacing and squaring these columns to the first columns. Check the width of the second arch as in Step 5d and space the second two column tops to match. Mark this arch as the second arch.

Step 6: Attach the arches to the columns.

a. Temporarily attach two 1x4 scrap pieces at the top of one column, on the two outside faces. These will act as stops for the ends of the arch.

b. Using a stepladder and with some assistance, set the first arch on top of the first two columns. Check for fit. If off, shift the arch to divide the difference between each side. Toenail the arch to the tops of the columns with 16d finishing nails. Attach a long board to the top of the arch, then to a stake in the ground to prevent the arch from falling over.

c. Repeat this process to attach the second arch.

Step 7: Cut and attach cross braces.

a. Use a router with a 45-degree chamfer bit to chamfer the edges of the 2x4 stock to be used for the cross braces. Measure between the outside edges of the columns on one end of the arbor. Do the same on the other end. They should be equal. If one measurement is slightly longer than the other, use the long measurement to cut the cross braces to length. Then use the miter saw to cut a 45-degree partial bevel on each end to match the 45-degree edge chamfers.

b. Fit the first cross brace across the top center of the two arches, aligning the ends flush with the outside edge of each arch. Secure with 3" screws.

c. Attach the remaining cross braces per Figures A and C.

Step 8: Construct the capitals according to Figure B.

a. Measure the inside distance between the tops of two end columns. Cut the capital ledge to this length, try a test fit, then trim to fit. Measure the width of each column. Trim the capital ledge width to fit. Attach with top of filler 3/4" above the top of the columns, toenailing the first end with 8d finishing nails. Check for level and toenail the second end to the other column.

b. Clamp a piece of wide capital trim to each side of the capital ledge, flush with the top face. Cut the bottom capital filler to fit between the two columns and the two clamped trim boards and test fit with the bottom edges flush. Mark the bottom edges of the clamped trim on each column. Remove the trim and attach the capital base shelf to the columns using 8d finishing nails and align the bottom of the base shelf with the trim marks on the columns.

c. Use the router to chamfer the edges of the wide trim, just as you did earlier with the cross braces. Cut the trim boards to fit, with 45-degree mitered ends, so they extend to the outside faces of the columns. Then cut the end pieces of the trim, again with two mitered ends, to complete the "wrap" around each column. Secure all the wide capital trim with glue and 8d finishing nails.

d. Chamfer and cut the narrow capital trim the same way, mitering the corners to wrap the trim around the capital and posts. Fasten narrow capital trim to wide trim using glue and 6d finishing nails.

e. Repeat Steps 8a through 8d for the other side and finish arbor as desired.

Gate Instructions

General: Unless otherwise instructed, countersink screws, set nails and fill holes. Clean excess glue from wood per the manufacturer's instructions.

Step 1: Make pattern templates.

a. Using a trammel stick or beam compass, lay out crest rail, short filler and long filler patterns on the 1/4" hardboard per Cutting Diagram.

b. Cut out the crest rail, short filler and long filler patterns. Make patterns as precise as possible and sand edges for a smooth fit.

Step 2: Cut the crest rail, short filler and long filler.

a. Lay the crest rail pattern on the (12") 2x12 stock and draw around the pattern. Avoid knots and defects if possible.

b. Cut out each crest rail. First, use a jigsaw to cut the rough outline, approximately 1/8" outside the pattern lines.

c. Temporarily screw the hardboard template to the roughsawn rail. Use a router with a straight-cutting bit to trim the rail outline smooth and flush with the template.

d. Cut out the long fillers and the short fillers in the same manner.

Step 3: Construct the panel assembly.

a. To ensure that the slats will fit flush to each other, set the rabbet bit depth by testing on scrap 1x4s.

b. Rabbet the hinge side, per Figure D and cut to length.

c. Rabbet the remaining eight slats, per Figure D and cut to length. Rabbet the 8' 1x4s and then cut them into 4' lengths.

d. Glue the nine slats together using Gorilla Glue. Use bar clamps to hold them edge to edge and clamp some straight lengths of the 2x6 across the face of the panel to prevent buckling. Place wax paper under the 2x6 boards to prevent glue from adhering to them.

e. After the glue has set, lay out and cut the panel top, per Figure D.

f. Rabbet across the bottom edge, per Figure D.

g. Rabbet and cut to length the 1x4 bottom filler.

h. Repeat Steps 3a through 3f for the second panel.

Step 4: Assemble the gate.

a. On a clean, flat surface, lay out the crest rail, latch stile and lower rail. Check the fit of the top of the latch stile to the crest rail notch. Trim as needed to obtain a good fit.

b. Place a framing square against the lower rail and the latch stile to ensure a 90-degree fit and use clamps to hold in place.

c. Cut the hinge stile slightly long and use the crest rail to scribe the upper end of the hinge stile. See Figure D. Keep the hinge stile in line with the lower rail. Cut out the scribed line with a jigsaw and check for fit to the gate top. If necessary, make fine trim cuts until you get a good fit. Then mark and cut the bottom of the hinge stile to length. Check to be sure it's square.

d. Lay the short filler and the long filler on the gate crest rail. Check for fit and trim if necessary. Attach the filler pieces to the crest rail with Gorilla Glue and 1 5/8" screws.

e. Lay the panel assembly on top of one of the gate frames. Check the hinge slat for a good fit against the short filler. The top arc of the panel does not have to fit perfectly, because it will be covered. Attach the panel assembly to the gate assembly using Gorilla Glue and 1 5/8" screws, making sure that the edges are flush. Make sure the rabbeted bottom edge is pointed out.

f. Attach the rabbeted bottom filler to the bottom of the panel assembly with glue and 1 5/8" screws. Trim the bottom filler if necessary to fit flush with the gate frame bottom before attaching.

g. Lay the other crest rail, latch stile, lower rail and hinge stile on top of the panel assembly. Cut and fit the hinge stile as in Step 4c. Check for fit and trim if necessary. Attach with glue and 16d finishing nails.

h. Cut to fit and glue in place a small filler piece from a scrap 1x4 at the bottom corner of the short top filler. Cut slightly large and sand flush with the hinge stile.

See Figure D.

i. After the gate is assembled, sand the edges, if necessary, using a belt sander to ensure that all three layers are flush and smooth.

j. Use a router with a bearing-guided 45-degree chamfer bit to stop chamfer the inside of the gate top, latch stile, hinge stile, lower rail and the top edge of the crest rail. Stop the chamfer when the base of the router is even with the outside joint.

k. Repeat Steps 4a through 4j for the second gate.

Step 5: Install the gates.

a. Make marks on the hinge stile edges at 12" from the top and 4" from the bottom. Attach the top and bottom hinges with their outermost edges aligned to these marks. Attach the middle hinge centered between the top and bottom hinges.

b. Hang the gates so that the lower edges are approximately 1 1/2" off the ground.

c. Attach the gate stop on the hardware stile of the active gate; let it overlap the passive gate by 1/2". Attach with glue and 1 5/8" deck screws.

d. Attach the gate latch and cane bolt hardware according to the manufacturer's instructions.

Step 6: Sand smooth and finish the gate as desired.

Originally published in Lowe's Wood Post magazine. Copyright
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Arbor & Gate Tools and Materials

Tools (for arbor and gate)

- Table saw
- Portable circular saw
- Power miter saw
- Jigsaw
- Router with 1/2" collet
- Straight-cut router bit (1/2" diameter, 2" long double-fluted shaft)
- Bearing-guided chamfer bit (45-degree)
- Cordless drill with 3/16-inch drill bit and countersink bit
- Phillips #2 screwdriver (or driver bit for drill)
- Tape measure
- Framing square
- Trammel/beam compass
- Protractor or adjustable angle guide
- Builder's level (4-foot or longer)
- Hammer
- Nail set
- 3/4" mounting tape
- Shovel or posthole digger
- Wheelbarrow or mixing tub and hoe (for mixing concrete)

Lowe's Shopping List (for arbor)

Lumber

- 2 (8') 1x2s*
- 4 (8') 1x2 pine boards (for bracing and staking)
- 2 (8') 1x4s*
- 1 (8') 2x4*
- 9 (10') 2x4s* (one for staking)
- 12 (8') 2x6s*
- 1 (10') 2x6*
- 5 (12' 2x12s*
- 1 (4'x4') sheet of 1/4" hardboard
- 1 (4'x8') sheet of 1/4" fir/pine plywood (for full-scale layout of arch pattern)

Hardware

- 1 (1-pound box) 2 1/2" PrimeGuard Plus screws
- 1 (1-pound box) 3" PrimeGuard Plus screws
- 1 (5-pound box) 16d galvanized finishing nails
- 1 (1-pound box) 8d galvanized finishing nails
- 1 (1-pound box) 6d galvanized finishing nails
- Gorilla Glue
- 4 (50-pound) bags fast-setting concrete
- Drainage rock
- Wood filler

*Lumber rated for outdoor use.

Lowe's Shopping List (for gate)

Lumber

- 1 (8') 1x6*
- 1 (10') 1x4*
- 10 (8') 1x8s*
- 1 (12') 2x12*
- 3 (10') 2x6s*
- 2 (8') 2x4s*
- 1 (4'x4') sheet of 1/4" hardboard

Hardware

- 6 (4") broad loose-pin hinges, galvanized
- gate latch
- 12" cane bolt
- 1 (1-pound) box #6x1 5/8" PrimeGuard Plus screws
- 2 (1-pound) boxes 16d galvanized finishing nails
- Gorilla Glue
- Wood filler

*Lumber rated for outdoor use.

Arbor Cut List

Part	Quantity	Dimensions (in inches)	Material
Long arch segments	12	cut using 1/4" hardboard pattern	12'-2x12
Short arch segments 2x12	8	cut using 1/4" hardboard pattern	12'-2x12
Column struts	12	1 1/2x5 1/4 x88	8'-2x6
Capital ledge	2	1 1/2x5 1/4 x25*	8'-2x6
Capital base	2	1 1/2x5 1/4 x25*	8'-2x6
Cross braces	19	1 1/2x3 1/2 x34*	10'-2x4
Wide capital trim (side)	4	4 3/4x3 1/2 x35 1/2*	8'-1x4
Wide capital trim (end)	4	4 3/4x3 1/2 x7*	8'-1x4
Narrow capital trim (side)	4	3/4x1 1/2x37*	8'-1x2
Narrow capital trim (end)	4	3/4x1 1/2 x8 1/2 *	8'-1x2

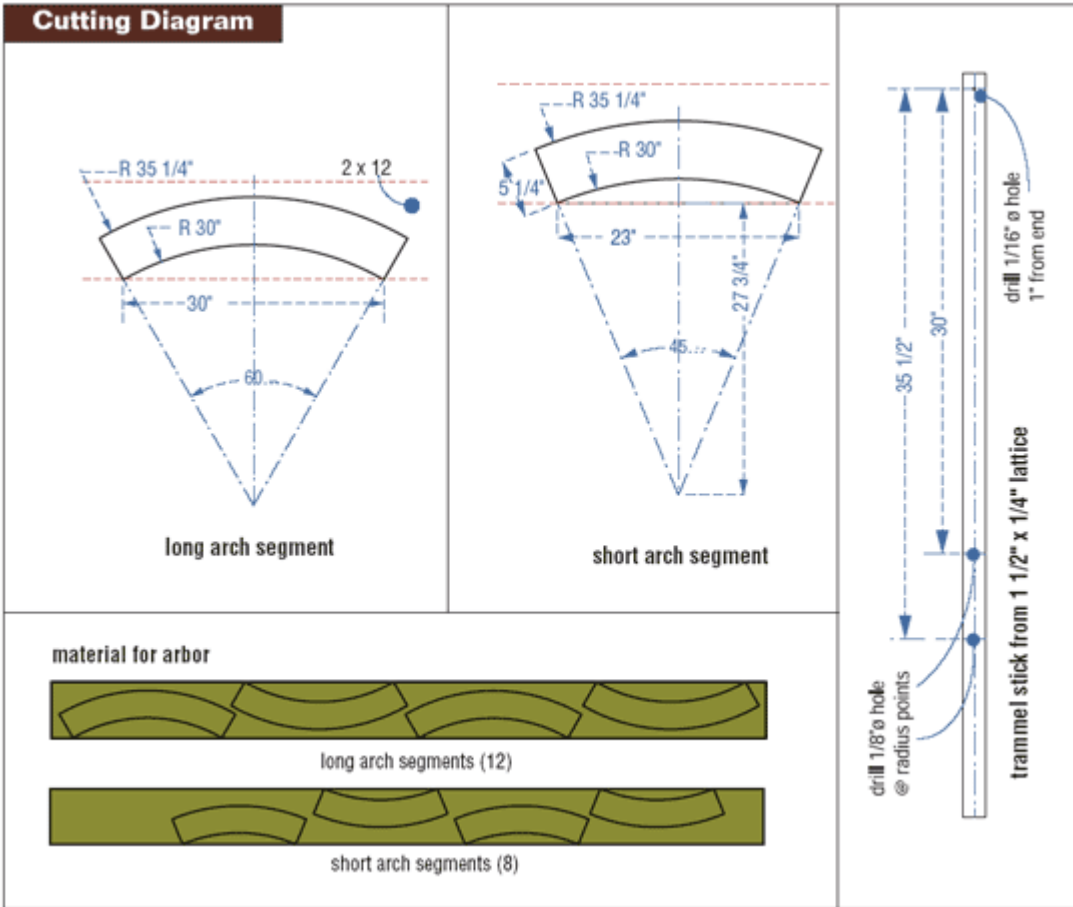
*Cut/scribe to fit after posts are installed; adjust length as necessary.

Gate Cut List

Part	Quantity	Dimensions (in inches)	Material
Crest rail	4	Cut using 1/4" hardboard pattern	12'-2x12
Lower rail	4	1 1/2x5 1/4 x24 7/16*	10'-2x6
Hinge stile	4	1 1/2x5 1/4 x49 1/8*	10'-2x6
Latch stile	4	1 1/2x3 3/8 x33 3/4*	12'-2x4
Slats	16	3/4x3 1/2 x48*	8'-1x4
Hinge slat	2	3/4x3 1/2 x48 3/4*	10'-1x4
Rabbeted bottom filler	2	3/4x3 1/2 x29 3/4*	10'-1x4
Long filler	2	Cut using pattern	8'-1x6
Short Filler	2	Cut using pattern	8'-1x6
Corner filler	2	Cut to fit	1x4 scrap
Gate stop (chamfer outer edges 45 degrees)	1	3/4x3 1/2 x39 3/4	10'-1x4

*Cut/scribe to fit.

Arbor Cutting Diagram



Gate Cutting Diagram

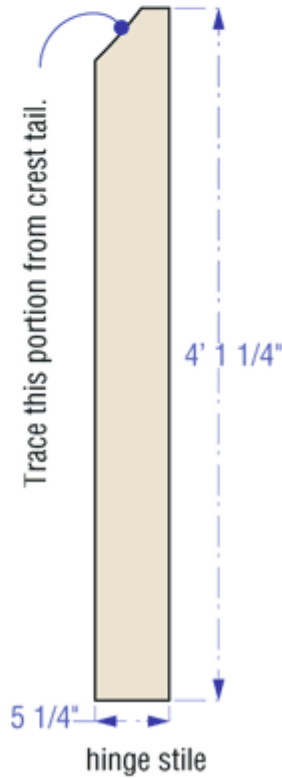
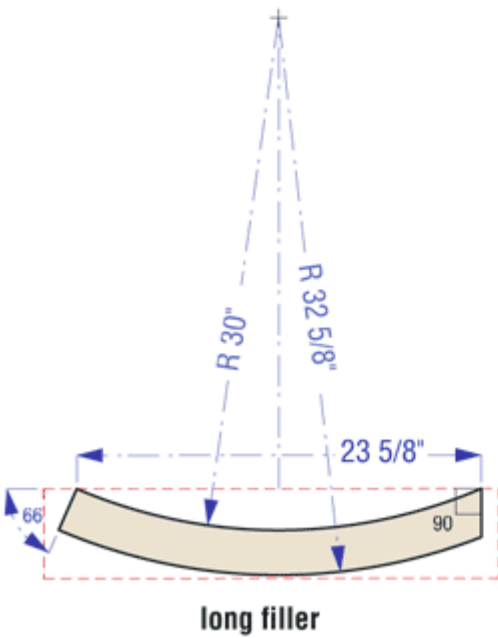
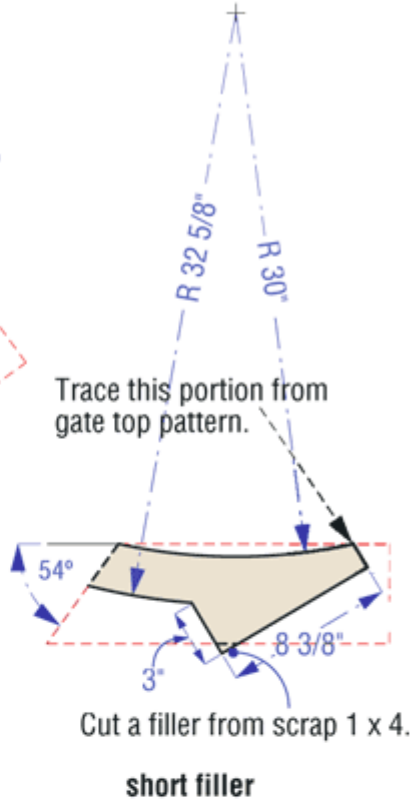
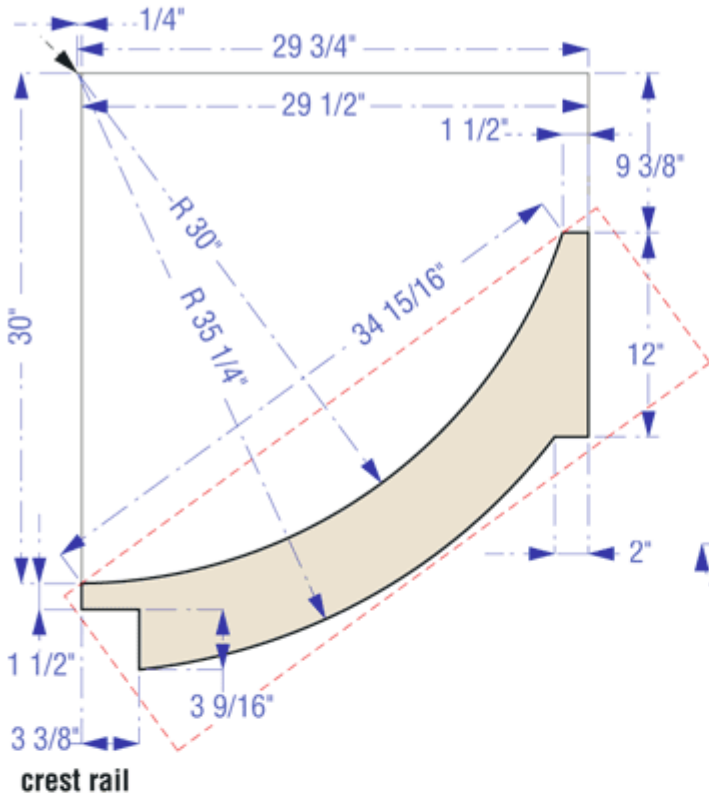
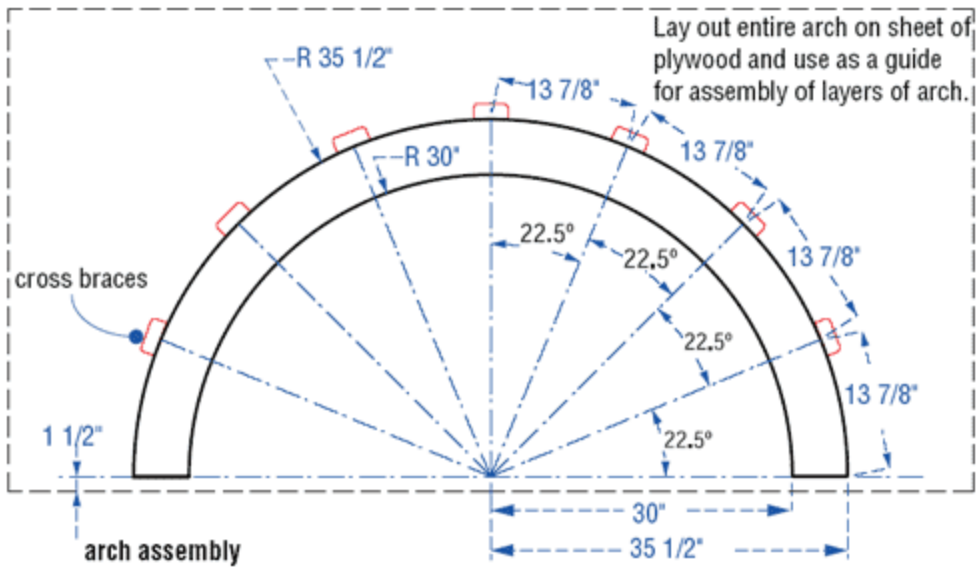
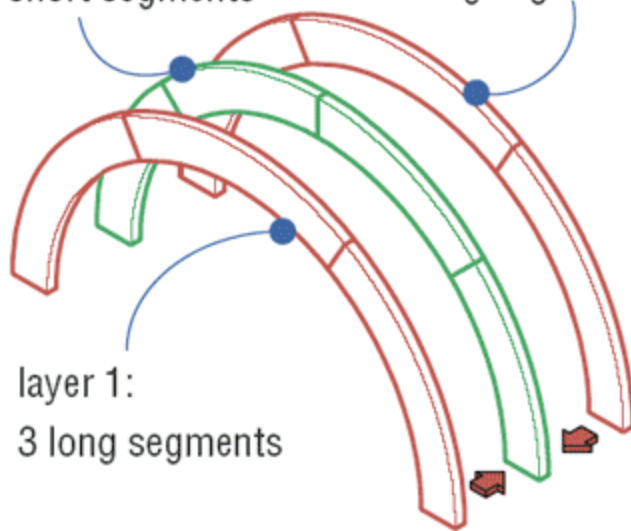


Figure A



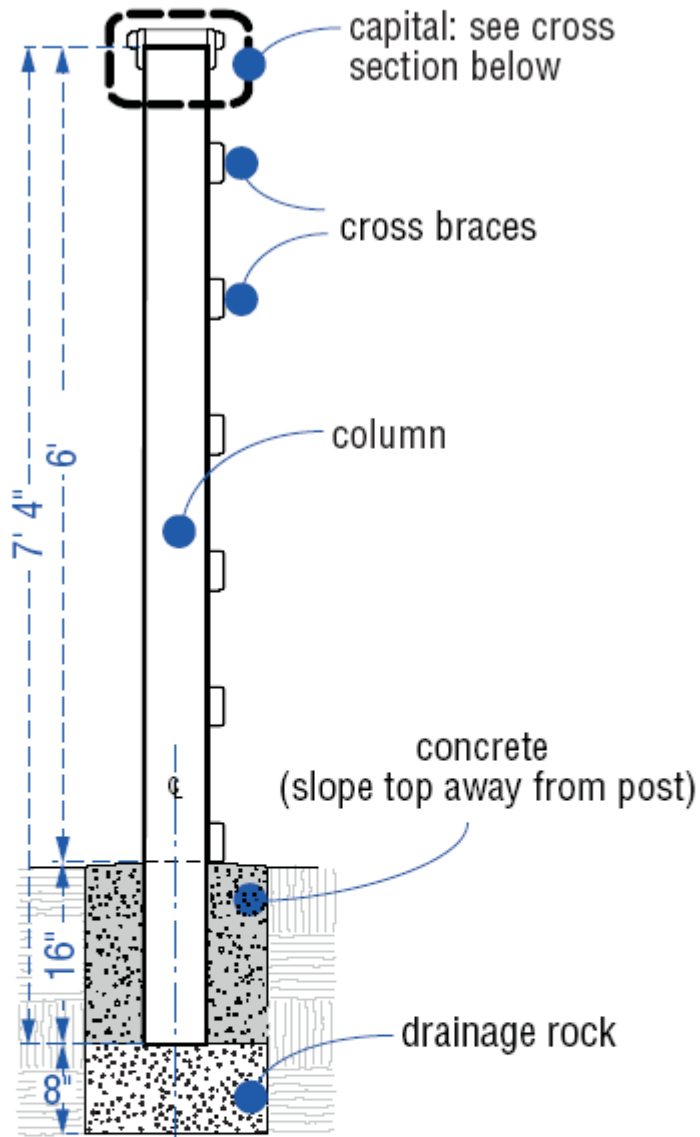
4 short segments

3 long segments

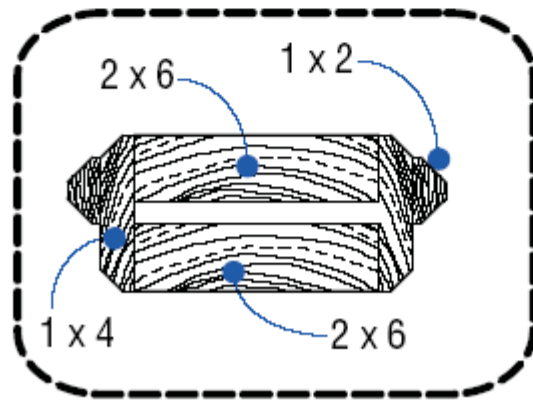


arch construction

Figure B

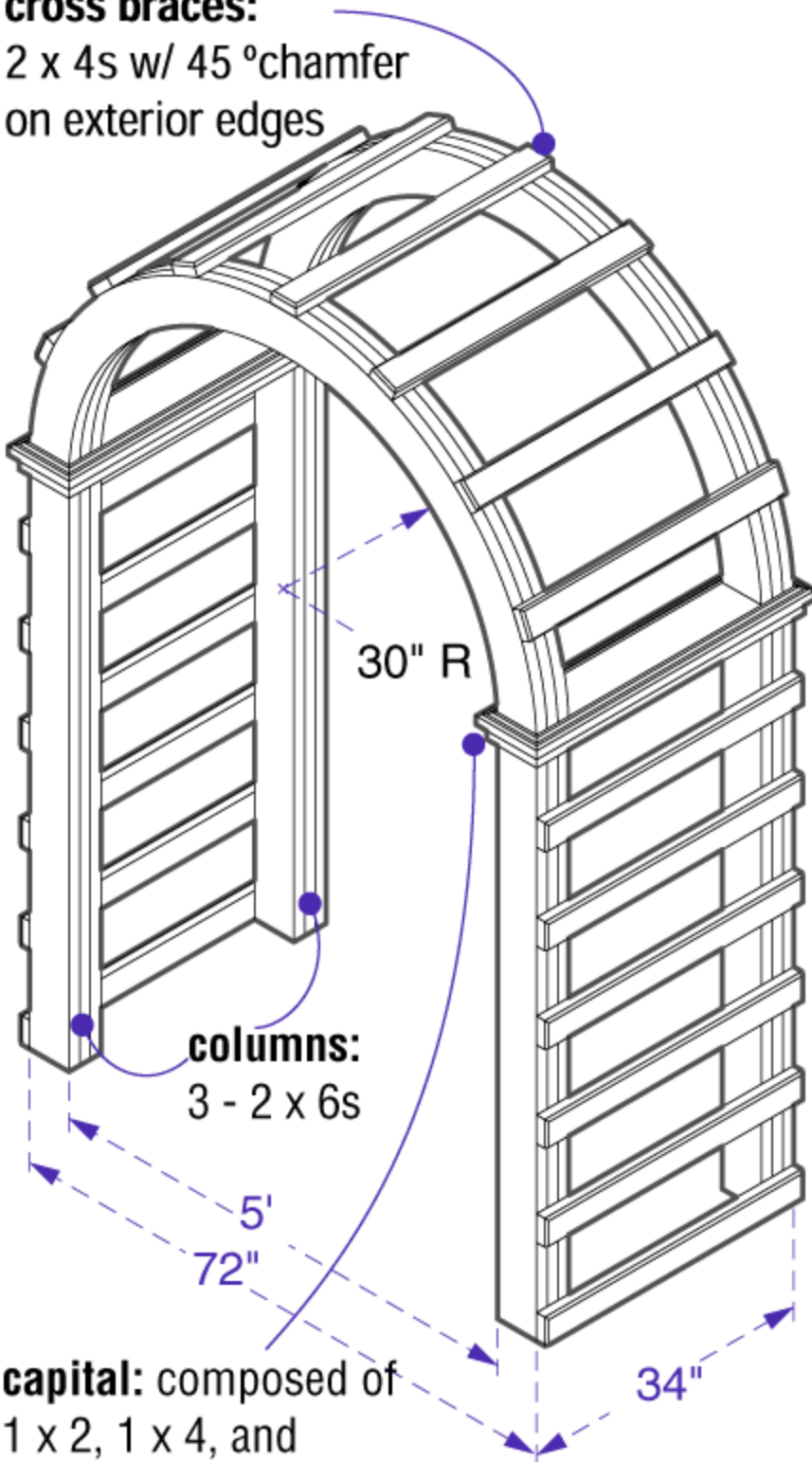


column detail



cross section of capital

cross braces:
2 x 4s w/ 45° chamfer
on exterior edges



30" R

columns:
3 - 2 x 6s

5'

72"

34"

capital: composed of
1 x 2, 1 x 4, and
2 x 6 (see detail)

Figure D

