

Profitable Curved Benches



Place slats on edge and flex to create distinctive seats without steam bending or laminating

by Scott Smith

Benches are great up-sells, and building them in a shape other than the usual boxy rectangle immediately puts you a notch above your competitors. But of the three approaches to forming a curve, two present serious challenges. The most difficult method is to bend wood or composite into a shape it doesn't want to be. Whether you heat or steam the material, or laminate thin strips on a curved form, you need expensive equipment, a shop, and lots of time.

A second method is to cut curved pieces from wide boards. This works well if you can cut

curves consistently and don't mind a lot of waste. However, longer benches must be built from segments, which will require joints in the surface of the bench. You will also have to sand and rout the edges of the curved pieces to make them look finished.

Most of the time, though, I use a far simpler method. I rip 1-inch wood or composite decking into slats about 2 inches wide. I stand the slats on edge, bend to the desired curve, and secure. Spacers allow for drainage, a particularly nice feature in a wet climate. To support the

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Figure 1. The curved bench will need at least four points of support (three points results in a V-shaped bench). The author has spaced out the posts evenly across the deck to verify position before removing the decking to gain access to the framing.



Figure 2. On an existing curved deck, the author locates the posts by measuring in from the deck's edge.

slats, I anchor 4x4 posts into the framing before installing the decking. In the project discussed here, the deck had already been built, so I had to remove decking for access.

Design With the Material in Mind

Most benches will be shorter than the longest available deck board, which normally runs about 20 feet. Placing a joint in the middle of a curve to make a longer bench is difficult at best, and usually leaves a flat spot on the curve.

You also need to know how far the material can be bent before it will break. I have bent composites to as tight a radius as 8 feet — but that's been in the summer, when I could pre-bend the slats by leaning them against a wall in the sun. You can make even tighter bends by heating or steaming the slats, but that complicates the process considerably.

The seat has to be supported in at least four places to define a curve (**Figure 1**). Using only three will give you a V-shape. I usually place a support post — made from a treated or composite 4x4 — about 1 foot in from each end of the curved bench and space the other posts evenly within the remaining span. Spans greater than 4 feet are likely to sag.

I like to build curved benches with EverGrain composite decking (Tamko Building Products; 800/253-1401, www.evergrain.com). I've also successfully bent Trex (Trex Company; 800/289-8739, www.trex.com) and cedar. Most of the other composite products I've tried haven't worked as well. If you build with wood, be sure to use clear material. Wood tends to break at the knots when it's bent.

Lay Out the Arc

Determining the curve of the bench can be done several ways. Most of the time, I'm building a bench to match the curve of the deck. When that's the case, I simply mark in from the edge of the deck half the width of the bench to locate the center of the support posts (**Figure 2**). I use thirteen rows of slats on most benches, making them a little more than 13 inches wide, so the center radius is about 7 inches in.



Figure 3. With the decking removed, each support post is nailed in place with blocking on all four sides. If the post lands partially on a joist, notch the post, not the joist.

Block the Posts

Once the arc is marked, I affix all the support posts. Because most posts will land between the joists, I use blocking. It's necessary not only to support seated people, but also because the stress of bending the slats for the bench top will tend to move the posts if they are not fastened securely.

The blocking is cut to fit between the joists — square to the radius to keep the posts aligned properly. I find the radius by using two framing squares back to back so that they look like a T. Place the squares so the same measurement on each, say 12 inches, aligns with the outer edge of the deck, and the line between their other legs runs through the center of the post location.

Next, I mount the posts to the framing. I secure all four sides of the 4x4 posts to the joists and blocking with plenty of 3½-inch nails (**Figure 3**).

If a post falls on a joist, notch the post — do not cut the joist. I set posts 17 inches above the tops of the joists. This will make the finished

Square Decks

When I build a curved bench on a square deck, I decide on a radius for the arc that defines the outer edge of the bench, say 10 feet. Then I locate the center point of the arc's circle, which is 10 feet from the outer edge of both ends of the bench. If this point lands between joists, I put a temporary wood block there.

Next, I build a simple compass with a 1x2 and a nail. For a 10-foot radius, I measure 10 feet minus half the width of the bench — about 9 feet 5 inches, total — from the end of the 1x2. I drive a nail at this point into the 1x2, through the center point on the deck. Holding a pencil at the other end of the 1x2, I swing it across the framing to mark the arc along which the support posts will be placed.

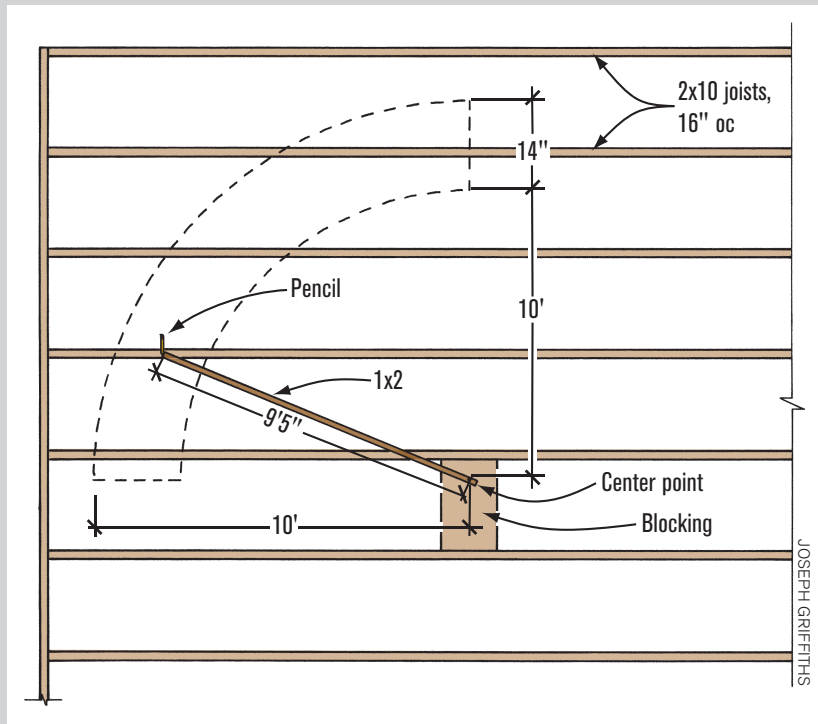




Figure 4. Three screws hold each 2x4 bench support to its post. The inner ends of the 2x4s are run a little long, allowing them to be trimmed exactly after all the seat slats are installed.



Figure 5. Allowed to run about 1 foot past each of the end supports, the outer fascia is cut to accept a mitered end piece, and screwed into the ends of the 2x4 supports. This fascia is set flush with the bottoms of the 2x4s, and its height above them will be the same as the dimension the slats are ripped to.

bench 18 inches high (add 2 inches for the thickness of the slats and deduct 1 inch for the decking), which is a comfortable sitting height for most people.

Frame Supports for the Slats

I glue and screw treated 2x4s on two sides of the posts, flush with the tops, to support the slats (**Figure 4**). To determine the length of the supports, I measure the width of however many layers of slats will make up the bench top, usually 11. Yes, I said 13 before, but that number includes the front and back fascias, which fasten to the ends of these 2x4s, not their tops.

I always cut the 2x4 supports an inch or so long. As the slats are bent into place, their actual combined width will vary depending on how tightly the bench boards fit together. Leaving the supports a little long allows them to be cut to the exact length after the slats are installed.

I center a 2x4 support on a 4x4 post, set it flush with the top of the post, and nail it once using a nail gun. Then I level the 2x4 and nail it again. I set the support on the other side of the post the same way and then run at least three 3-inch deck screws through each 2x4 into the 4x4. It's a good idea to apply glue between the post and the 2x4.

Fascia Board

Once the supports are all installed, I mount the outer fascia board (**Figure 5**). The fascia boards are full-width deck boards, usually 1 inch thick by 5½ inches wide. I use a tape measure to get an approximate length, allowing for the fascia to extend about 1 foot past the end supports.

When I'm done, fascia will wrap the front, back, and ends of the bench. The joints between the fascia ends and the front and back fascia will be miters, so I bevel cut each end of the outer fascia at 45 degrees when I cut it to length. If the fascia board has a grain pattern on one side only, be consistent in which side shows.

Either blocking or a helper supports one end of the fascia while I work from the opposite end, bending and attaching it with two 3½-inch deck screws to each support 2x4. The bottom of the fascia should be flush with the bottom of the support 2x4s, and the ends of the fascia should extend equal distances from the support



Figure 6. Spacers are screwed to the fascia board above the 2x4 supports, and the slats are bent into place.



Figure 7. In addition to being screwed to the block behind, each slat is toe-screwed to the 2x4 supports.

posts. If not, use a circular saw set at a 45-degree bevel to shorten the longest end. I also make sure the fascia board extends above the 2x4s by about 2 inches.

Install the Seat

I rip three deck boards down to 2 inches for the slats, preserving the factory-molded edges. This produces six long pieces, but only five will be needed for slats. The extra piece will be cut up for blocking between the slats at the 2x4 supports.

You may need to cut more pieces of blocking from deck scraps. Most of the time, I cut these blocking pieces so that they're about an inch longer than the combined width of the post and the 2x4 supports. This usually works out to be 7 $\frac{1}{2}$ inches. Once installed, the slats and blocking will cover the support framing so it can't be seen from above.

Place one block, ripped edge down, over each set of supports next to the fascia (**Figure 6**). Drill and countersink one hole in the center of each block, and attach the blocks to the fascia using 1 $\frac{5}{8}$ -inch deck screws. The screws should exert enough force to curve the center of the block tight to the fascia, but you may need to encourage them with a clamp or additional screws, particularly in cold weather.

Lay the first slat next to the blocks, ripped edge down. Make sure the ends extend beyond or at least flush with the end of the fascia on each end. If the slats have a grain pattern on one side, your finished product will look better if you mount them all with the grain facing the same direction.

Drill and countersink holes near, but not exactly lined up with, the screws holding the blocks in place. Attach the slats with one 2 $\frac{1}{2}$ -inch screw through each block and into the fascia or previous slat. Then angle one 2 $\frac{1}{2}$ -inch or 3-inch screw through the slat into each support 2x4 (**Figure 7**). You may need to use a chisel to shave off the bump that the screw creates, or the bump will prevent the next piece of blocking from pulling tight to the slat.

Continue in this manner, lining up each block with the previous blocks. The twelfth row should consist of blocks. Once they're all attached, use a reciprocating saw to trim the 2x4 supports flush with the blocks.

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On this particular deck, I added more interest to the bench by cutting the blocks so they'd look like a circle once installed. I drew a pattern of a circle whose diameter equaled the finished width of the bench. By laying the blocking stock on this circle, spaced one slat-width apart, I was able to mark each piece of blocking at the cor-

rect length and angle to create the circular shape in the bench (**Figure 8**).

Mitered Ends Finish the Bench

I use a framing square and pencil to mark both ends of the slats for cutting. I cut them flush with the inside of the miter cut on the existing outer fascia board, finishing the cut on the last one using a handsaw or reciprocating saw.

Next, I select a full-width deck board for the inner fascia, and bevel one end of it 45 degrees. Line this end up so that the inside of the miter cut is flush with the slats and its top is flush with the top of the blocks. Attach it to the 2x4 supports as you did the outer fascia, working toward the outer end and carefully pushing the fascia into the curve as you go (**Figure 9**). Be patient and give the board time to adjust to the bend. Bar clamps may help.

After attaching the inner fascia to the last support, mark and bevel cut the remaining end at 45 degrees using a circular saw. Cut two fascia boards for the ends and screw them to the slats. I finish up by easing the mitered corners with a $\frac{1}{4}$ -inch or $\frac{3}{8}$ -inch round-over bit in a router. ♦

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Figure 8. Cutting the spacers at varying angles and lengths results in a circular pattern. The 2x4 supports will be cut off flush with the final block.



Figure 9. The author screws the inner fascia home.