

# Curvaceous Ipé Garden Benches

Clamps and lots of screws put a bend in this dense and durable wood

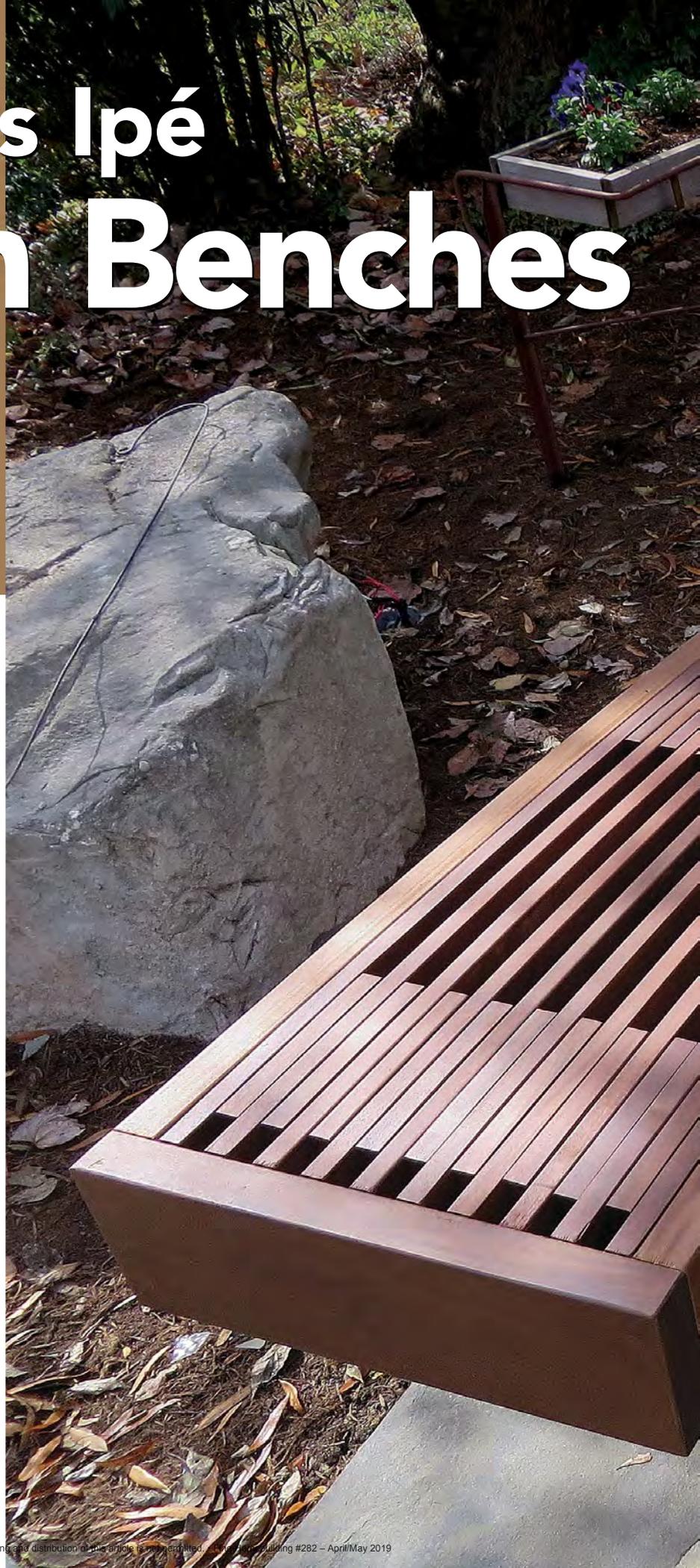
BY TRIP RENN

**A**s the owner of a company, I have two functions: one, fretting; and two, saying, “Yes, we can do that.” Fortunately, the high quality of my crew keeps the fretting to a minimum and has so far bailed me out of all the unlikely projects I have said yes to. This project was no exception. Frequent clients Susan Sharpe and Nancy Duffner initiated an extensive landscaping project and asked us to handle the woodwork. The plans called for two curved benches made of ipé. The faces and ends of the bench would be 2x6, and the centers would be 1x4.

My initial reaction was that it would be a piece of cake to bend 12-ft. ipé 2x6s and create a bent lamination by screwing it to the 1x4 layers. For the bench to straighten itself out, each piece of the lamination would have to move in relation to the pieces on either side of it. By fastening the laminations so that they couldn't move in relation to one another, the bench as a whole would retain the curve. I didn't take into account how much ipé would resist bending.

## Wrestling with ipé

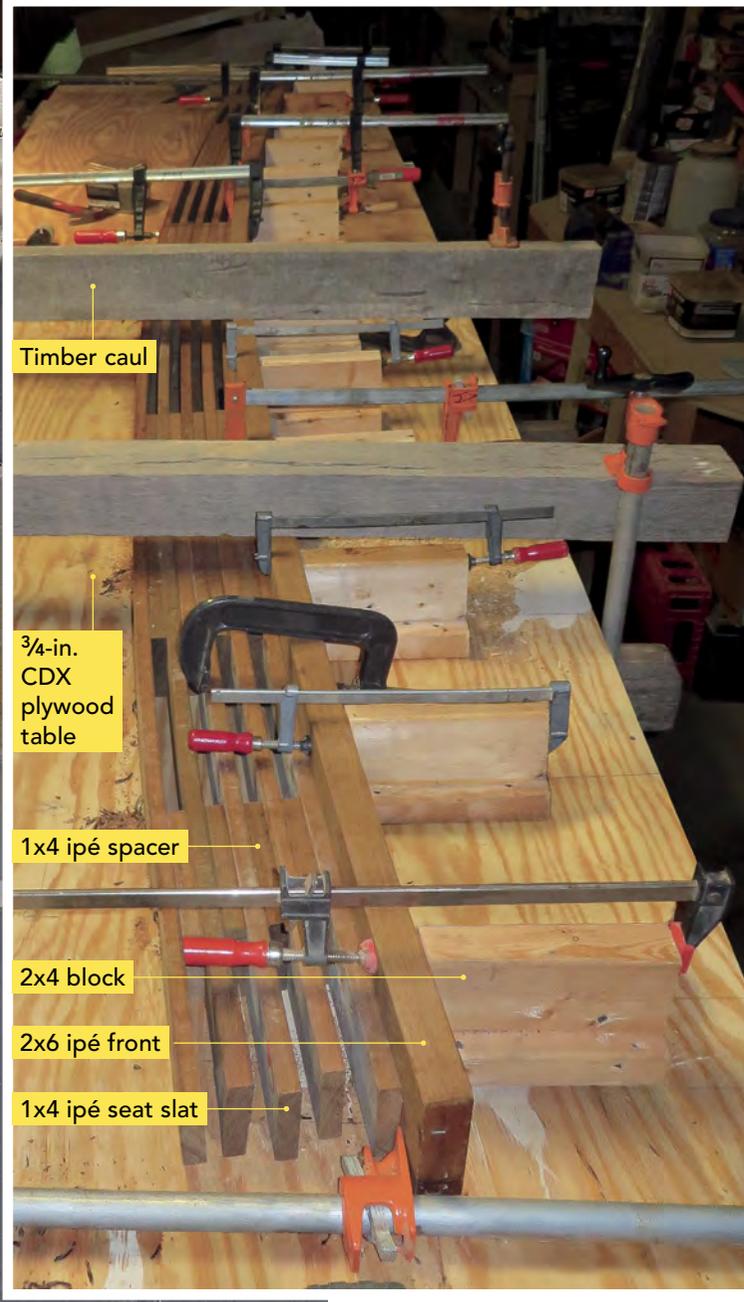
The plans called for a 12-ft. bench and an 8-ft. bench, and they gave the curve as increments of deviation from a straight line at every foot of the length. My crew and I used this to position clamping blocks on a  $\frac{3}{4}$ -in. CDX plywood table. The blocks themselves were 2x4s screwed together in a T-shape. Their 5-in. height was perfect, and they provided a wide-enough base to screw to the table. The plan was helpful, but the curves also could have been laid out on the plywood using a fairing stick. A fairing stick is a thin piece of clear, straight-grained wood that bends





## YOU CAN NEVER OWN TOO MANY CLAMPS

To bend the ipé, clamps hook on 2x4 blocks that are screwed to the bench top. After each layer is clamped to the previous one, deck screws installed through pilot holes lock the laminations together.



Timber caul

3/4-in. CDX plywood table

1x4 ipé spacer

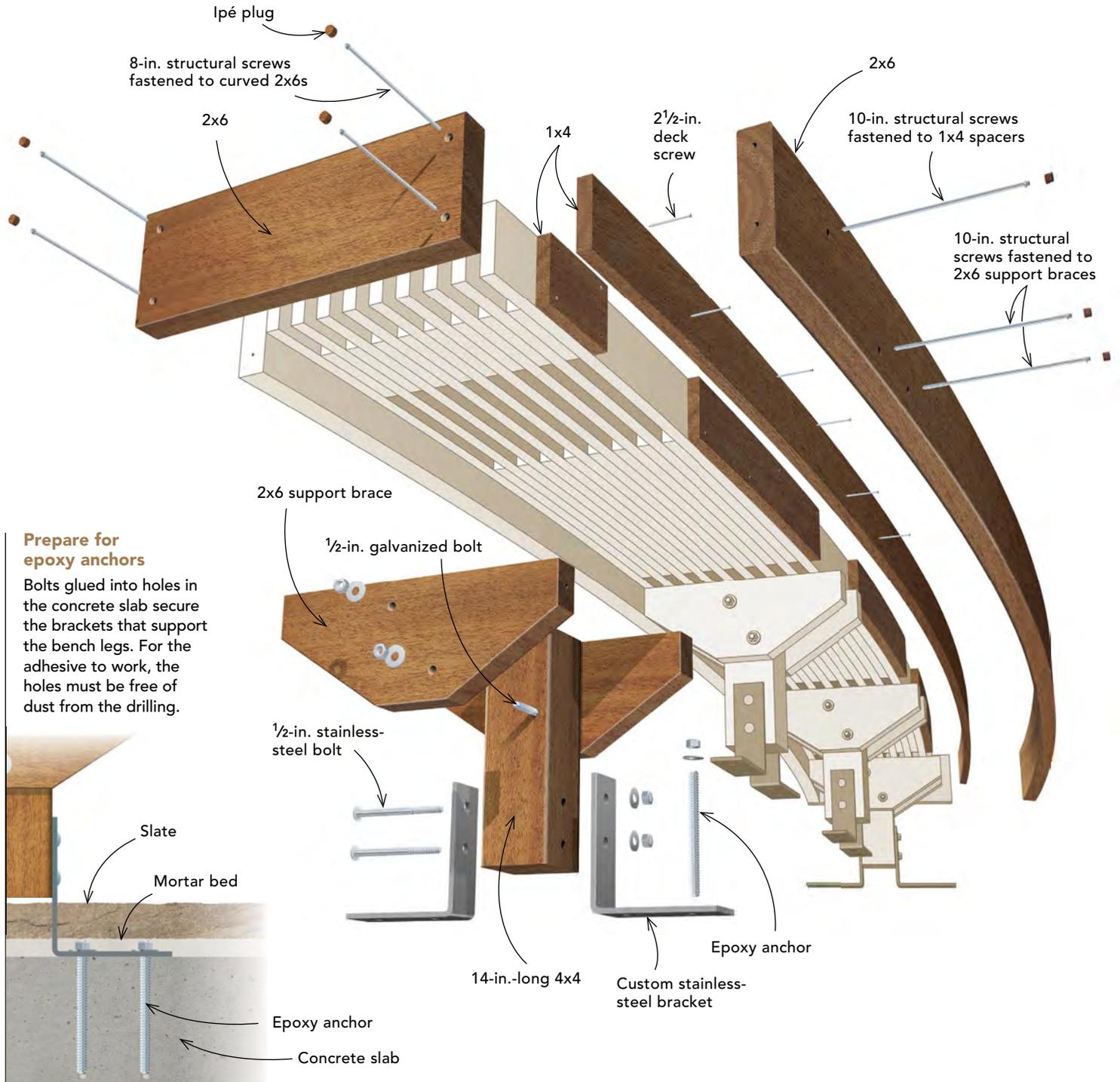
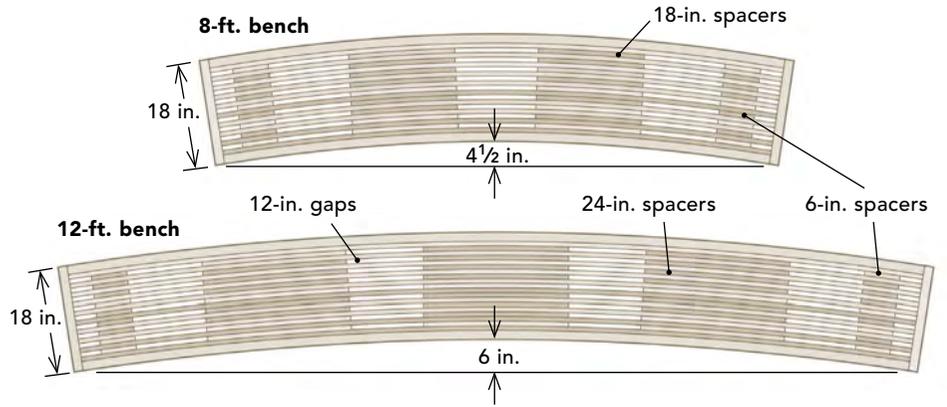
2x4 block

2x6 ipé front

1x4 ipé seat slat

# YOU CAN NEVER HAVE TOO MANY SCREWS

A series of deck screws and longer structural screws lock the laminations together. Structural screws are also used to tie the bench to the support braces. Custom stainless-steel brackets join the bench to the patio.





**Drilling the legs.** Because there might be slight variations in the elevation of the slab, the holes in the legs for the bracket bolts are drilled on site, where accurate measurements can be taken and transferred.

to the curve you're trying to achieve. Often, a string is used to adjust and fix the curve, just like on an archer's bow.

My education in the obstinacy of ipé began with my attempt to bend the first 2x6. I clamped one end of a 12-footer to a block that was screwed to the bench top. When I brought the opposite end about halfway to the other end block, the first block ripped from the table and whipped across my little shop.

My crew saved me from my initial optimism. They strengthened my clamping table, using more screws to affix the clamping blocks and clamping the 2x6 to the table itself. Then we began laying up the pieces of ipé that comprise the bench: the 2x6 front (inner curve), followed by 12-ft. 1x4s alternating with 1x4 intermittent spacers. Finally came the 2x6 back (outer curve). All of the members ran long and were cut to length later. The 2x6s had to be clamped down with heavy timber cauls to counteract their tendency to lift off the table as they bent.

My brother-in-law, a fine cabinetmaker and furniture builder, has always rolled his eyes at my meager clamp collection. He's right, of course, but my collection was improved significantly by the additional clamps purchased for this project. Overall, we probably used 20 clamps. Bessey deep-throat clamps were useful for reaching over the 2x6s, but Jorgenson I-beam clamps afforded the greatest pressure, and we also used a few Pony pipe clamps. Both the Jorgenson clamps and the pipe clamps bent under the force we applied—and one of my pipe clamps now sports a severe permanent bend.

### Screws, not glue

Ipé's density and oily surface made glue's performance questionable. Also, outdoors is a demanding environment for any glue; we felt that mechanical fasteners would do the job as well or better. For fasteners, we relied on six 2½-in. ceramic-coated decking screws through each 24-in.-long 1x4 spacer, and into the layers behind. This means each 1x4 is fastened through to the two layers preceding it with a pair of screws at each end and two middle screws that alternate high and low. We reversed the pattern of the middle screws on succeeding layers. Of course, the first 1x4 layer was attached to the 2x6 with shorter, 2-in. screws, so they wouldn't come out of the face. We drilled pilot holes with DeWalt tapered countersink bits. Ipé is so demanding that we burned up a bunch of bits, and despite the pilot holes, broke off many screws.

The sequence: clamp the layer, drill, screw, unclamp, place and clamp the next layer, and so on. When the lamination was fully assembled, we reinforced it by driving 10-in. FastenMaster structural screws into each group of spacers—one from the front and one from the back. These aren't supposed to need pilot holes, but again, this is ipé, so we drilled, then countersunk and plugged the holes.

We let the laminations run long, marked the ends with a framing square, made the cuts with a 12-in. circular saw, sealed the end grain with AnchorSeal, then capped the ends with 2x6s. Finally, we eased the edges with a ¼-in.-radius roundover bit in a router, sanded everything with a random-orbit sander, and applied several coats of Penofin.

### Holding up the benches

Custom stainless-steel brackets join the benches' 4x4 posts to the patio's underlying concrete slab. We coordinated with the landscaping contractor and installed the stainless-steel brackets with bolts epoxied into the concrete, which the masons then laid slate around. The 4x4s bolt to these brackets and are held slightly above the slate. This helps to prevent moisture from wicking into the end grain. □



**Ready for the masons.** With the brackets affixed to the legs, the bench is turned over. The next step is installing the adhesive anchors. Finally, the masons will return and lay the patio stone under the benches.

Trip Renn owns Actual Size Builders in Chapel Hill, N.C. Photos by the author.