MAKING Curved Flooring ONSITE

by Howard Brickman

I recently had the opportunity to install mahogany flooring on the treads and landing of a large-diameter radiused staircase. One approach to the situation would have been to divide the radius into segments, bandsaw the curve out of straight boards, and join the segments end for end. The problem with this approach is that there would be a lot of wide, very visible joint lines where the wood grain changed.

A more natural-looking technique, and the one I chose, is for a single piece of wood to follow the curve, which in this case could only be accomplished by bending. Bending wood is not difficult, but it is time-consuming and does require attention to detail. In short, the process involves ripping boards into strips, then gluing those strips back together around a curved form. And if you glue the strips back together in the exact sequence they came out of the board, the glue lines will be practically invisible.

The author and a helper align wood strips in sequence around the bending form.

Start With Choice Lumber

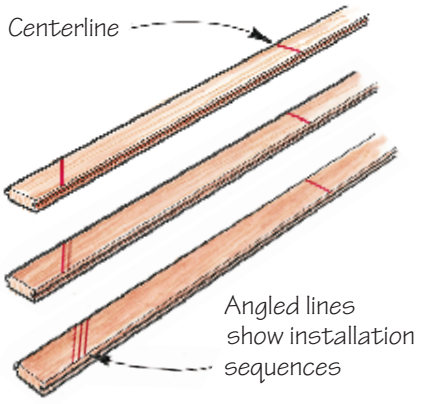
For the best outcome, choose pieces that are knot-free and with grain as straight as possible. It's generally easier to hide glue lines with straight grain than with busy flat grain. Also choose pieces that are wider and longer than the required finish piece, since ripping and end trimming will yield a smaller piece.

Marking the lumber before ripping is critical to proper alignment and sequencing during reassembly. I use two separate marks on the face of the boards: A square mark at the exact midpoint of the piece is used for aligning the strips, while one or more angled marks 6 inches from one end are used for maintaining the sequence (see illustration, at right). When more than one piece is being bent, make the sequencing marks distinct by using a different number of angled marks for each board. For this job, we used wide boards, but you could also use pieces of strip flooring.

Rip the boards into strips that are just narrow enough to be bent to the required radius. If you don't have a well-maintained, good-quality table saw, find a millwork or cabinet shop to rip the board for you.

continued

Critical Marks



Make two sets of marks on the floor boards before ripping: A centerline mark for aligning the strips and one or more diagonal marks for getting the strips back in the proper sequence.

To ensure a smooth curve, the author uses a belt sander to put the finishing touches on the plywood form.

Making the Form

I use 3/4-inch plywood for the bending form, and make it at least 12 inches longer than the piece being bent. It's okay if the form is segmented; just make sure it's wide enough — about 8 inches is good — to resist the bending pressure. It is generally best to bend to the inside curve. Be sure to verify the radius on site before cutting out the form. If you're unsure, you can make a full-size Kraft-paper template first.

If you're working on site, screw the form to a wood subfloor area that will not be disturbed for several days. Next, screw 6-inch-square 3/4-inch plywood blocks parallel to the form in a continuous arc. Space the blocks at a distance from the form equal to the width of the finished piece plus 2 inches. The extra 2 inches allow for wedges that will be driven to clamp the glued-up strips against the form.

After the forms are securely screwed down, paste-wax the wood subfloor and the inside edge of the form to prevent the finished piece from sticking in place. You'll need to make enough identical wood wedges to force the finished piece against the form (usually two per linear foot).

The Glue-Up

The process is fairly simple up to this point, but now the rubber meets the road: From the time you begin spreading the glue until all the strips are glued and clamped in place, you've got about five minutes — the "working time" of yellow carpenter's glue (I use water-resistant Titebond II for added insurance against spills).

In that five minutes, you must (1) uniformly apply glue to the edges of the strips; (2) place the strips in the form in the proper sequence and alignment; (3) wedge the strips into place against the inside edge of the form; and (4) fasten restraints on top of the form to hold the strips in place while the glue dries and cures (wax these, too).

The helper first screws the forms to the subfloor, then fastens the short plywood blocks against which wedges will be driven.

Since a lot of activity has to occur within a short time, it's important to carefully plan and organize your steps. Make sure, also, that you have plenty of hands available: It usually takes at least three people; larger pieces may require even more help.

Dry-Run First

Place the strips next to the bending form in sequence. Make an alignment mark at the midpoint of the form and match this to the centerline mark on the strips. You'll need to tack some finish nails into the subfloor to hold the the strips in place while the glue is being applied; otherwise, they will tend to "spring back" and get in the way.

This is a good time to practice the remaining steps before getting the glue out. Go through the motions of (1) spreading the glue (use a roller or wide brush); (2) placing and aligning the strips in the form; (3) placing the wedges in position after the last strip is in place; (4) tapping the wedges together (start at the midpoint and work toward the ends) to force the strips into position in the form; and (5) screwing the restraints over the strips.

When you are confident that you can complete the process in the allotted time, do it for real.

Finishing Up

Let the piece sit in the form overnight. The curved board may spring back slightly when it's removed from the form, but it can easily be forced back into the exact shape of the form during installation.

Opposing wedges clamp the plywood strips tight against the curved form.

Scrape and sand off all excess glue. It's generally best to let the piece sit unused for another day to allow the glue to cure and to allow the wood's moisture content to return to normal after the glue dries.

When this technique is properly executed, you'll have a piece of wood that gracefully follows the curve. And after floor sanding and finishing are complete, no one will ever know that the tree didn't grow that way.

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