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Pergola Perfect

Find inspiration and DIY tips with this gorgeous structure

BY TODD MOUNSEY

PHOTOGRAPHY BY ROGER YIP

WHAT DO YOU build when a flat deck with rails and stairs just isn't enough for your backyard oasis? A pergola is the perfect structure to suit a large lawn or even a simple grassy patch. It provides shade, a place for climbing plants to reach great heights and defines an outdoor living space. Discover the details that go into building the grand trelliswork and use the technical details to create a design to suit your needs—then, get building.



THIS LARGE pergola suits the grand view. Design one to match your surroundings



Creating Tenons on Big Timbers

TENONS ON BIG wood are often part of outdoor structures. The best tool for this job is a circular saw. Start by determining the size of tenon you need, then subtract this figure from the thickness of your timber. Adjust your saw so the depth of cut is the same depth as your tenon shoulder; mark the location of the shoulder with a pencil and square, then carefully cut along the waste side of the line. Make multiple cuts no more than 1/4" apart along the entire length of the tenon, more or less straight across the timber.

The remaining waste between saw cuts is easily and accurately removed with a chisel, much more so than if there were no cuts. You'll also find it helpful if you decrease the spacing between cuts in areas with knots or contrary grain. This step makes accurate chisel work much easier.

You'll enjoy the greatest speed if you knock out the bulk of the kerfed wood with a hammer, then use a chisel to remove what remains. Finish up by placing the flat face of your chisel down on the tenon, then take short, paring cuts to bring the wood down to the final dimensions.

PHOTO: ANDREW BROWN FOR THE EDITORIAL TEAM

Retractable Canopy



THE LARGE timbers used to construct the trellis provide some shade, but to block out the sun's rays effectively, you can add a retractable canopy. Using a simple pulley-and-track system, these canopies fold up easily when not in use. You can find them at many home-improvement and building-supply stores.

Creating Frame & Panel Assemblies

THE FRAME AND recessed panels featured as part of the support posts in this project could take you a long time to complete if you made them with traditional joinery methods. A faster option—one that's also more than strong enough and still looks great—involves creating false-panel assemblies using pocket screws.



Start by preparing wood for the vertical side members (the stiles), and the wider horizontal members (the rails). The key is that all the parts be exactly the same thickness.

Place the stiles and rails face down on a flat work surface, then drill angled holes for pocket screws on the back faces of the rails. Apply a small amount of weatherproof glue to the ends of the rails, clamp them to the stiles, ensuring smooth front-to-back alignment, then drive corrosion-proof screws to pull the entire assembly together.

At this stage, you'll have long, narrow, open frames—one for each side of each post. Scrape off the excess glue from the joints right away, then sand the visible part of the joints flat.

Pocket screws eliminate the need to wait for the glue to dry. Fasten additional pieces of flat lumber to the back faces of the assembled frames using more glue and screws. With each panel complete, join four panels together to form each column.

Connecting Frame & Panel Posts to Masonry

ANCHOR BLOCKS ARE the best way to fasten hollow, frame-and-panel posts to a masonry foundation. Glue together an anchor block using multiple layers of pressure-treated plywood (enough to create a 2 1/2"- or 3"-thick assembly), then fasten it to your masonry surface using 1/2"-diameter expanding metal anchors—one near each corner.

Simply hold the wooden anchor block in final position, then drill one hole in each corner using a 1/2"-diameter spade bit. Mark these holes on the masonry, then continue drilling with a rotary hammer spinning a 1/2" bit. You should be able to put at least 3" of metal into the masonry, so drill at least 4" deep (to provide a place for chips to collect in the bottom of the hole). Apply polyurethane construction adhesive to the underside of the anchor block, set it in place, then hammer the expanding anchors down into the holes as far as they will go with the nuts just barely on the threaded part of the anchor. Tighten these nuts when all four anchors are in place.

When it comes time to install the posts, set them in place over the anchor blocks, plumb the posts, then drive screws through the bottom ends of the stiles and rails, and into the edges of the blocks.

Creating Curved Parts with Pattern Routing



THE CHALLENGE WITH creating curved parts on thick wood is cutting the curves smoothly. Although there are some rare and expensive portable bandsaws made for cutting curves in timber-frame work, these aren't practical for do-it-yourself projects. In such cases, pattern routing can help. It works especially well for making the kind of curved knee braces that are part of this pergola.

Start by creating a pattern of the entire knee brace you want out of 3/4"-thick plywood, including the curved edge on what will become the bottom edge and the straight edge of what will become the top. You could make your pattern out of thinner material, but as you'll see, there's a reason for going this thick. Also, pay special attention to the quality of the curved shape of the pattern. Whatever you make will be faithfully reproduced on your wood, bumps and all.

For this kind of pattern routing, you'll need a 1/2"-diameter, flush trim router bit with a bearing on the shaft and a cutter length at least half as long as the thickness of the wood you're milling. Chuck this bit into a 3 1/4-hp router, then fasten the pattern to one face of your knee brace temporarily with finishing nails. Adjust the bit height in the router so the width of the bearing just barely rides along the top edge of the pattern, then switch on the tool and make a cut following the pattern.

If you're dealing with very thick wood, you may need to readjust the depth of the bit so the bearing rides farther down on the pattern, making a deeper cut that extends slightly past the middle of the workpiece. Remove the pattern, install it on the other face of the knee brace, then repeat the process. When routed edges connect from both sides, you'll have a nice, smooth curve.



YOU CAN add other accents to your outdoor design, such as a cross pattern that looks like glass mullions and outdoor lighting fixtures that make sure the fun doesn't stop after the sun goes down.

Cutting & Assembling Decorative Rafters

LOAD-BEARING RAFTERS THAT form enclosed roofs on houses are laid out and cut according to plans, but there's a better approach when you're dealing with decorative rafters. Complete the lower part of your pergola, then set up a safe work platform and improvise. Fold long pieces of uncut lumber together to form an angled peak to get a sense of the best rafter arrangement and to determine angles that are most attractive to the eye. When you think you have the main design right, fasten rafters together temporarily, then climb down and view your mock-up from all angles. If all looks good, take the parts down and cut them.

If you're building with standard 1 1/2"-thick lumber, make angled cuts using a circular saw. Thicker material, such as the wood used here, is best cut with a 12" mitre saw set up on a flat floor surface. Hammer together T-shaped wooden supports to support the long rafter stock on the floor at the same height as the mitre saw's bed. If you don't want to use traditional interlocking joinery, thick rafter parts are best joined with metal timber connectors, such as Canadian-made Timberlink (timberlink.com). Finish up by adding the horizontal roof members, called purlins between the rafters to add more strength. **D**

