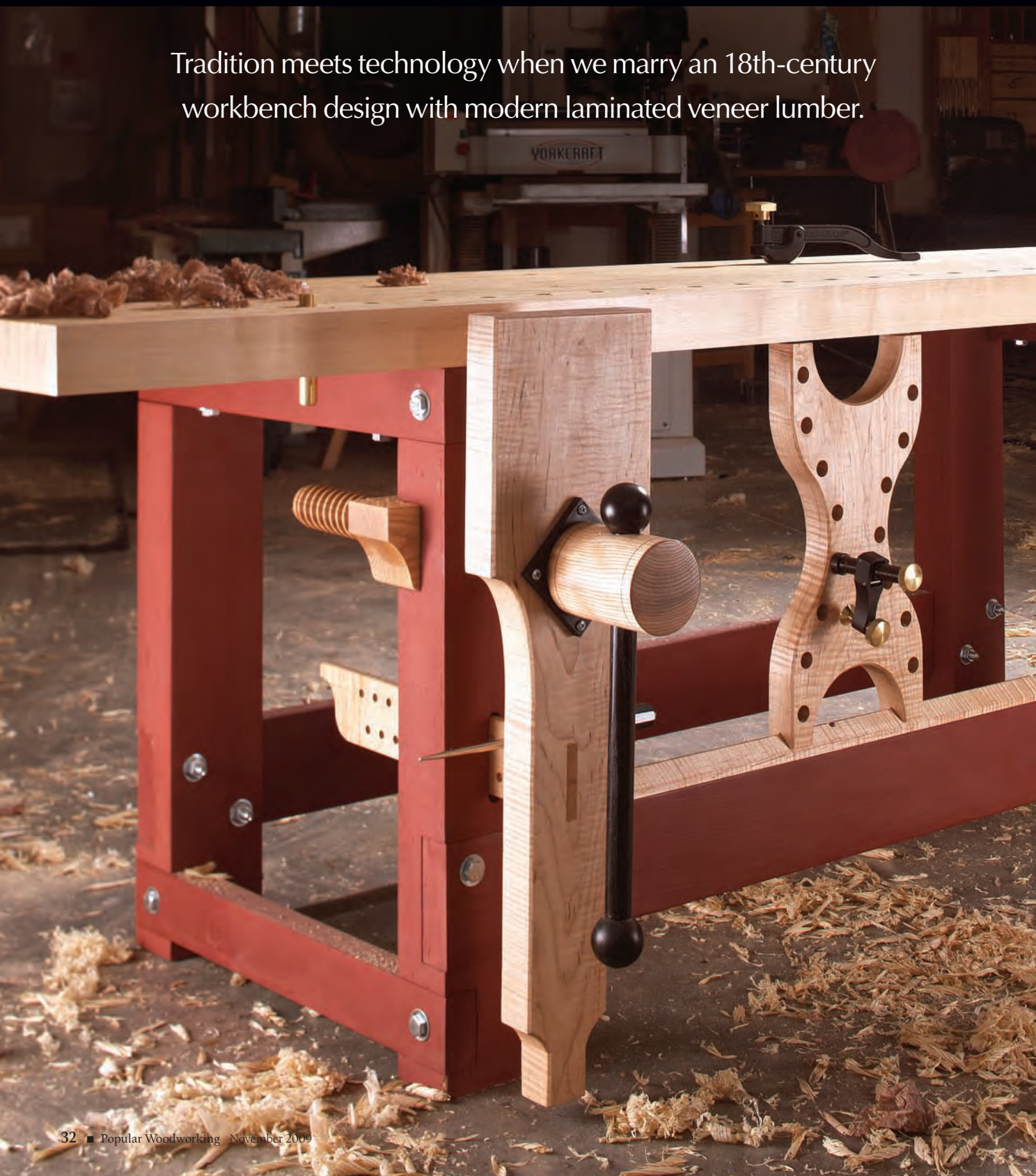
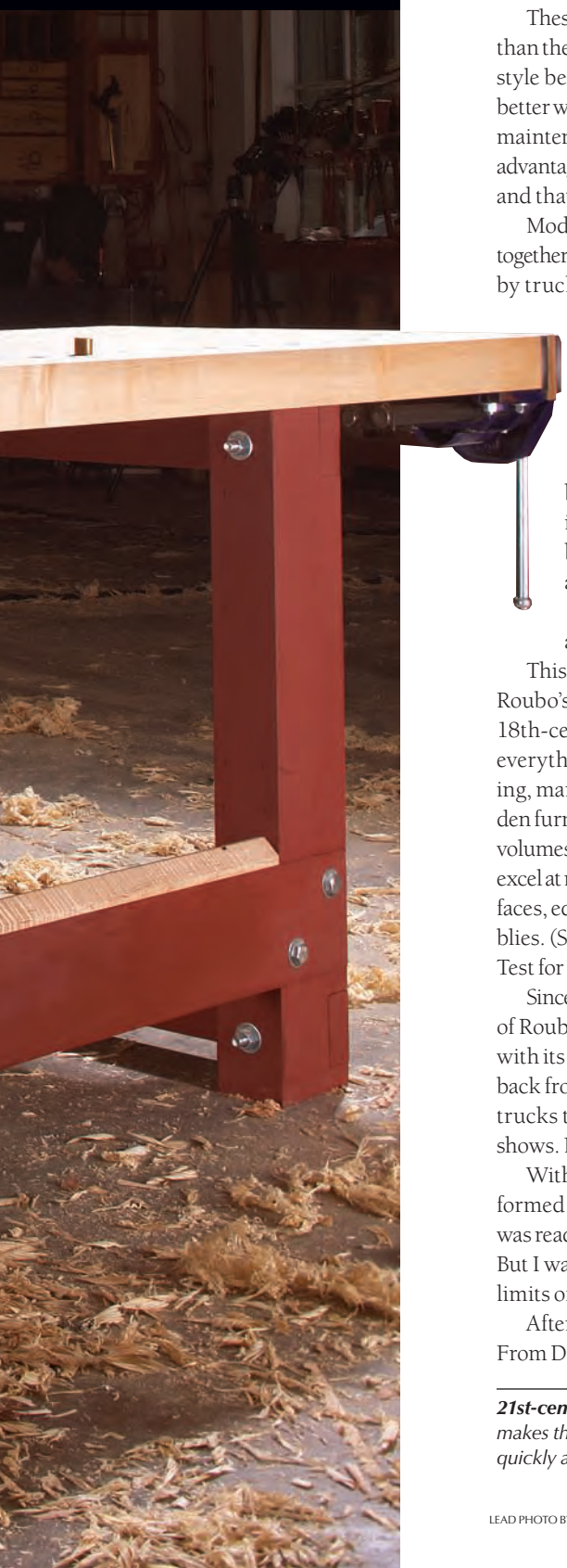
LVL Workbench

Tradition meets technology when we marry an 18th-century workbench design with modern laminated veneer lumber.



BY
CHRISTOPHER
SCHWARZ &
MEGAN FITZPATRICK



When it comes to workbench designs, I think it is difficult to improve on the 18th-century designs developed in Europe, England and the United States.

These behemoths are far simpler to build than the contemporary and common Euro-style bench, yet the old benches also offer better workholding, superior mass and less maintenance. In fact, there is only one true advantage offered by the Euro-style benches, and that's portability.

Modern Euro-style benches are bolted together and can be knocked flat and shipped by truck or rail. The ancient benches are about as portable as a pregnant brontosaurus.

After building and working on more than a dozen different workbench designs, I resolved to fix this problem with the ancient benches, and I set my sights on turning one of my favorite French workbench designs from the 1700s into a bench that could be disassembled in less time than it takes to knead a baguette.

This design was first published in André Roubo's "The Art of the Woodworker," an 18th-century masterpiece that explained everything from carpentry to woodworking, marquetry, carriage-building and garden furniture. The workbenches in Roubo's volumes are monolithic and simple, yet they excel at making it easy for you to work on the faces, edges and ends of boards and assemblies. (See the sidebar on the "The Kitchen Test for Workbenches" on page 37.)

Since 2005 I've been working on a version of Roubo's bench and am impressed daily with its versatility. I also have a crick in my back from moving this bench in and out of trucks to demonstrate it at woodworking shows. It is one solid chunk of wood.

With a little design work, I easily transformed Roubo's bench into a version that was ready for the traveling Cirque du Soleil. But I wasn't satisfied that I had pushed the limits of the bench's design.

After writing the book "Workbenches: From Design & Theory to Construction & Use" (Popular Woodworking Books), I was besieged by people who wondered if you could use engineered wood (such as plywood or MDF) to build a good workbench. I've used Baltic birch to make a number of workbench tops, but I've never been thrilled with cabinet plywood (it's unreliable these days), MDF or OSB (all of which sag like wet croissants). After doing some research I came across a material that you don't see much in woodworking shops: laminated veneer lumber (LVL).

21st-century Roubo. *A bolted-together base makes this massive, classic design knock down quickly and easily.*

About LVL

This layered material is like plywood in some ways and like solid wood in others. It is typically made up of many thin layers of veneer (such as yellow pine or poplar) that are glued into pieces that are basically sized like dimensional softwoods (2x12s, 4x4s etc.).

Unlike plywood, all the plies in LVL have their grain running in one direction – the length of the board – just like solid wood. But unlike solid wood, LVL beams have a lot of stiff glue sandwiched between the wooden plies. They are typically used as joists to span long distances in residential and commercial construction.

LVL beams are stiff, relatively cheap and easy to find at commercial lumberyards. But for the woodworker, there are a lot of question marks when it comes to working with the stuff. How stable is it? How easy is it to joint, plane, saw and rout? Will the glue tear up the cutters of our tools?

Ripped and ready. *We began by ripping down the LVL 2x12s we needed for the benchtop and were surprised by how easily the material cut on the table saw with a combination blade.*

LEAD PHOTO BY AL PARRISH; STEP PHOTOS BY THE AUTHORS

As luck would have it, Managing Editor Megan Fitzpatrick was ready to build a real woodworking bench after making do with the too-short spare workbench in the magazine's shop. And she was game to try out the LVL. So we bought enough material for an 8'-long version of Roubo's workbench and got to work.

A Top of Many Laminations

I think it's best to begin by building the benchtop. Then you can hump it onto sawhorses and use it as a work surface to build the base. You can indeed build a bench without having a bench – I've done it many times.

We ripped each LVL 2x12 into four 2¾"-wide strips. Then we jointed the solid-wood faces of each strip. The nice thing about LVL is that the faces are thick enough to withstand a couple passes on the jointer before you cut through the laminations – it's like thick, old-school veneer.

Scraping glue. *After gluing up four strips into a chunk, we scraped off the excess yellow glue before dressing the lamination on the jointer. After all, the knives were already taking a beating from the glue between the plies so removing any glue we could was an act of kindness.*

After slicing into the LVL on the table saw we learned some of the finer points of this engineered material. Because of the laminations, there really aren't any stresses in the planks. It cuts easily, like nice plywood.

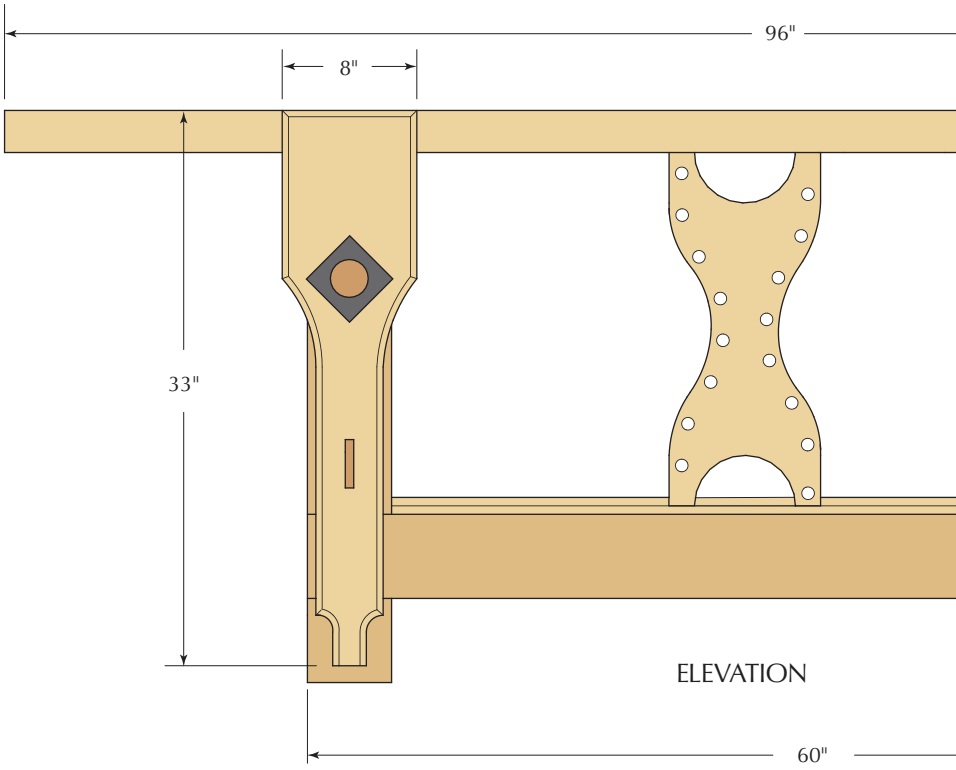
The bad thing about LVL is the seams. Every 6' or so there is a scarf joint where the laminations overlap one another. These seams determine the direction you should run the material over the jointer. We jointed one of them in the wrong direction and the reward was a big splintery bite at the seam.

The material is fairly consistent. The first plank was dimensionally perfect in thickness and width. The second one was not. One end was a little thicker than the other (about 1/16") and the plank had a pronounced crook – but only on one edge.

After ripping them, we turned all the strips 90° and prepared to glue them face-to-face. To keep the glue-ups manageable, we glued four strips into a chunk. Then we repeated this operation three more times. When the glue was dry in these laminations, we jointed and planed the four laminations and glued the four pieces into two large laminations. Then we carefully glued these two laminations into a benchtop that was about 24" wide.

LVL Workbench

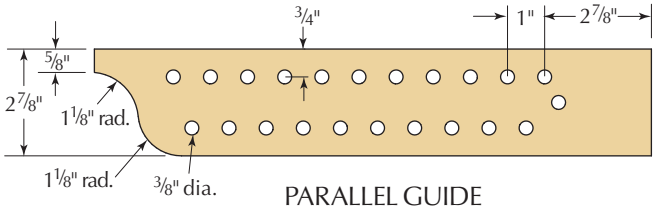
	NO.	ITEM	DIMENSIONS (INCHES) T	W	L	MATERIAL	COMMENTS
❑	1	Top	2 1/2	24	96	LVL	With maple banding
❑	4	Legs	3 1/4	5	31 1/2	LVL	Glued from 2 pieces
❑	2	Long stretchers	1 5/8	5	60	LVL	Half-lapped into legs
❑	4	Short stretchers	1 5/8	3	24	LVL	Half-lapped into legs
❑	1	Leg vise chop	1 7/8	8	33	Maple	
❑	1	End vise chop	1 7/8	3	17	Maple	Screwed to vise
❑	1	Board jack	1 7/8	9	23	Maple	Long; trim to fit
❑	1	Board jack track	1 5/8	1 1/4	50	Maple	Bevels on long edges
❑	1	Garter	3/8	3 3/4	3 3/4	Maple	
❑	1	Parallel guide	1/2	2 7/8	17 1/4	Maple	



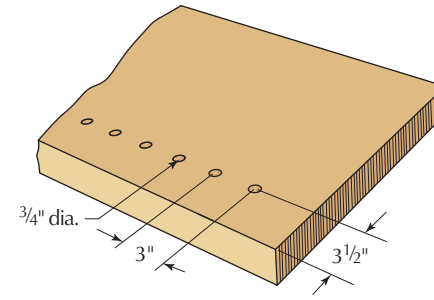
Online EXTRAS

For a free SketchUp drawing of this bench and a tutorial on how to flatten a workbench top with handplanes, visit our web site at:

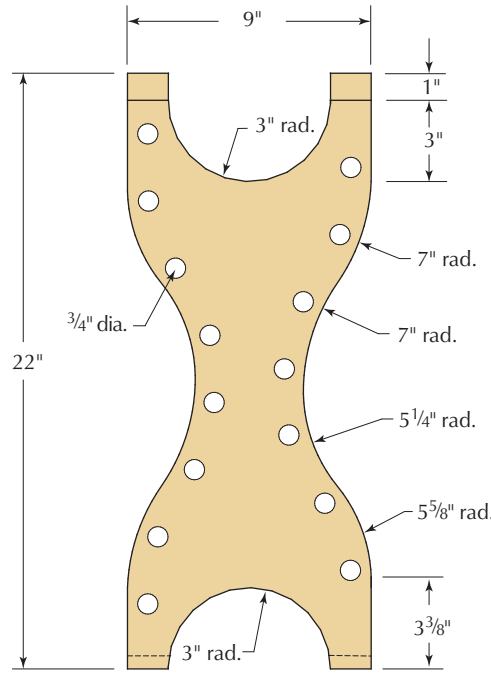
popularwoodworking.com/nov09



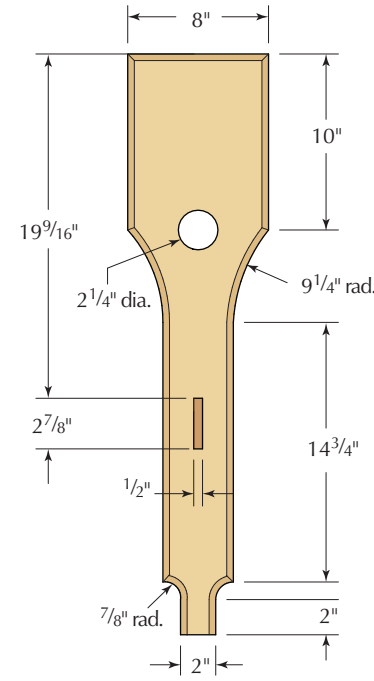
PARALLEL GUIDE



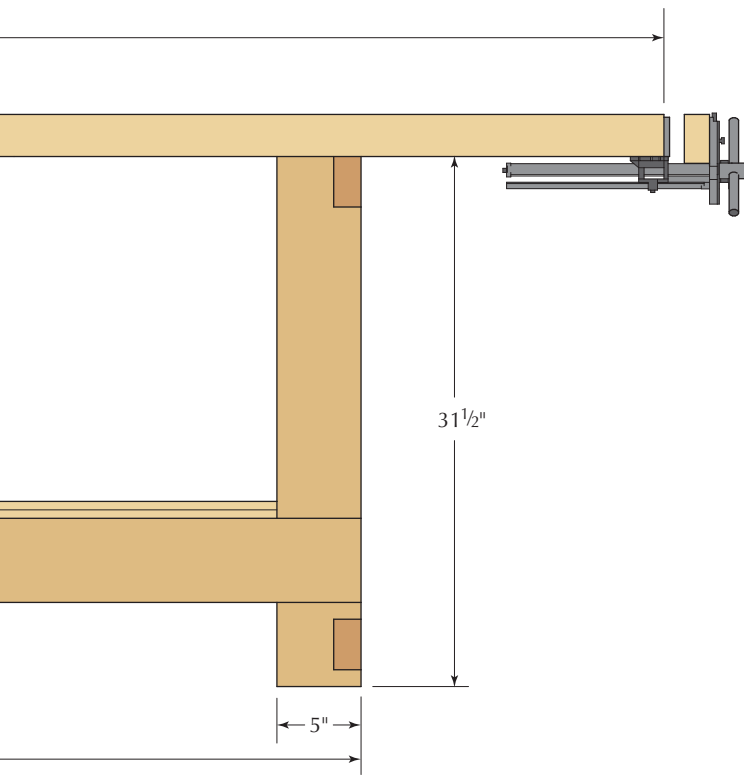
DOG HOLE PATTERN

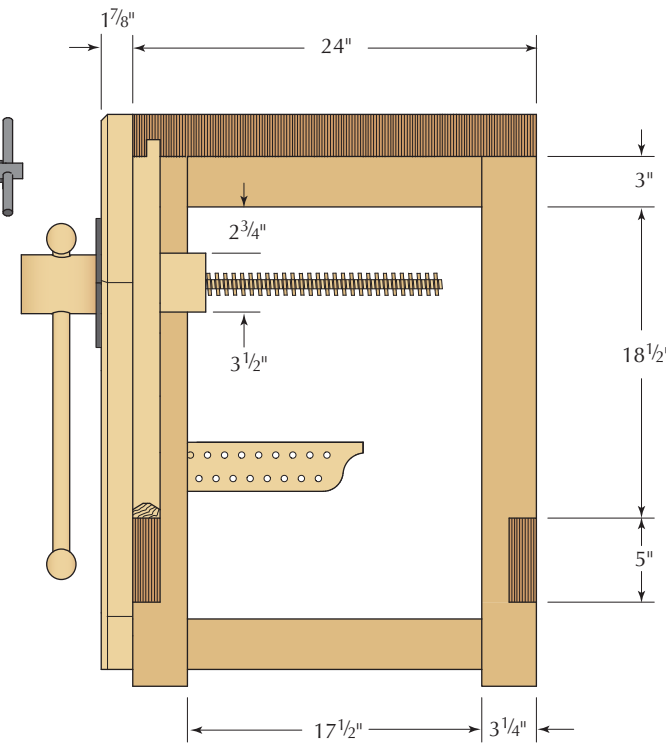


DEADWOMAN



LEG VISE CHOP





SECTION

We used yellow glue through most of this project and didn't have any problems. When gluing LVL made using yellow pine, we recommend you keep it clamped at least five hours. Yellow pine has resin that resists glue penetration.

Of course, there are some other important details you should know about when working with this material. We didn't want to run the LVL through the machines any more than we had to, so we took extra care to line up all the laminations as we clamped them. The extra care paid off, and when we glued the two final 12"-wide laminations together we jointed their mating edges and decided to take an extra precaution: some Dominos.

The Base: Beef & Nuts

This is the simplest base I could design that is both robust and completely functional. Each leg is made from two lengths of 5"-wide LVL that are face-glued. Then you cut half-lap joints in the legs using a dado stack in your table saw and bolt everything together using 1/2" hex-head bolts, washers and nuts.

Once we got the legs glued up, building the base took less than six hours, and we stopped several times to take pictures (and we got coffee, which is as important as glue in our shop).

Begin by gluing up the legs using pieces that are slightly oversized. Let the adhesive cure, then joint and plane all four legs to a consistent final thickness. The length of your legs is, naturally, what will determine how tall your workbench is. The cutting list and drawings will produce a benchtop that is 34" from the floor – the same height as a typical table saw.

The way to determine the correct bench height is to measure from the floor to the joint

Jointing with carbide. *Our jointer has a carbide-insert cutterhead, and it had no problems dealing with the glue in the LVL. I was more worried about the planer, which has high-speed steel knives.*

Planing is no problem. *We were surprised by how well the planer's knives fared after dressing all the laminations for this project. After dozens of passes through the machine, the knives didn't look any worse for the wear.*

Looking for bumps and hollows. *When dealing with an 8'-long edge, it can be difficult to find the source of the problem with an edge. We balanced a straightedge at several places along the edge, then pinched the ends of the straightedge. If the straightedge rotated easily, there was a hump under it. If the corners dragged and there was light under the straightedge, we had a hollow on that edge.*

Dominos will do 'ya. *You can use almost any method to align the two edges you are gluing up for the top: biscuits, splines or even dowels. We have a Festool Domino in the shop, and it's perfect for this sort of accurate work.*