

Woodsmith[®] PLANS

HEAVY-DUTY WORKBENCH



HEAVY-DUTY WORKBENCH

For a low cost and a weekend of work, you can build a large, rock-solid workbench that's sure to last a lifetime.



What goes into a great workbench? Most of us would agree it has to have a number of key features. For starters, the base must be sturdy — no wobbling allowed. And it must have a large, flat work-surface that's rugged enough to stand up to years of hard use.

Storage would be helpful. And to keep the cost down, it should be built out of materials that you can get anywhere. Finally, it would be great if you could put it together in a short time, like a weekend.

Sound too good to be true? I thought so, too — but all these must-have features are built into the workbench pictured above.

The secret to the strength of the workbench is selecting the right materials. The base is built from “two-by” stock, and the top, shelf, and end panels are made from MDF. I chose these materials for their sturdiness, low cost, and ready availability. This means you can get everything you need in just one trip to your local home center.

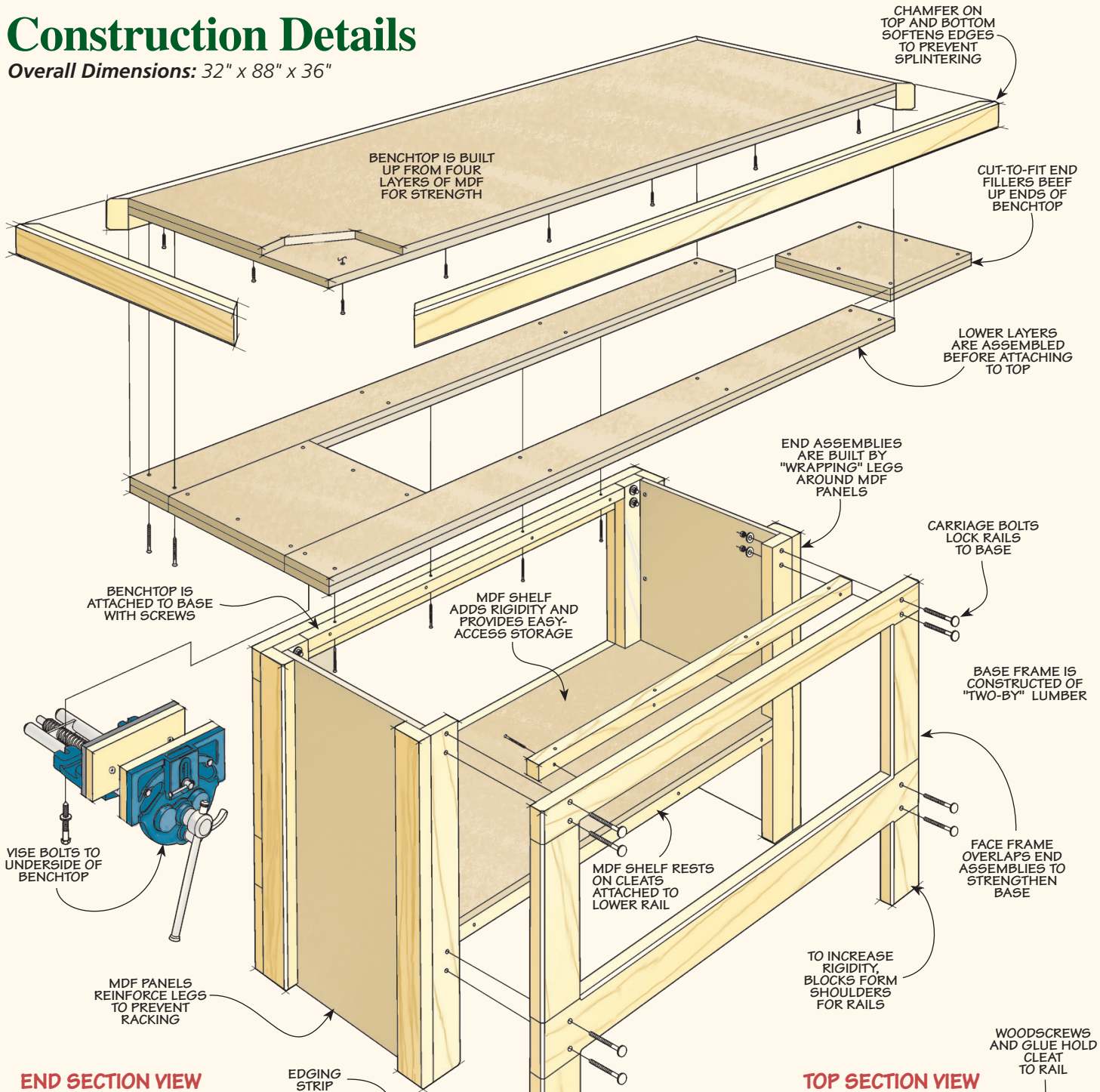
The joinery is about as simple as it gets — glue and screws. But each piece builds on the previous one to create a rock-solid bench that will stand up to heavy use. This construction also means that building the bench won't take a lot of time.

Finally, as good as this bench is, you can make it even more versatile by adding a bolt-on woodworking vise that's easy to install as well.

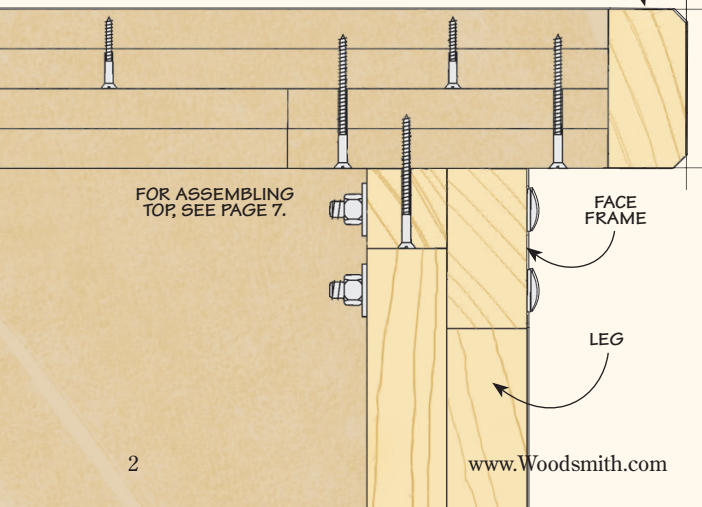
For the money, this is one rock-solid workbench that will give you years of hard-working service.

Construction Details

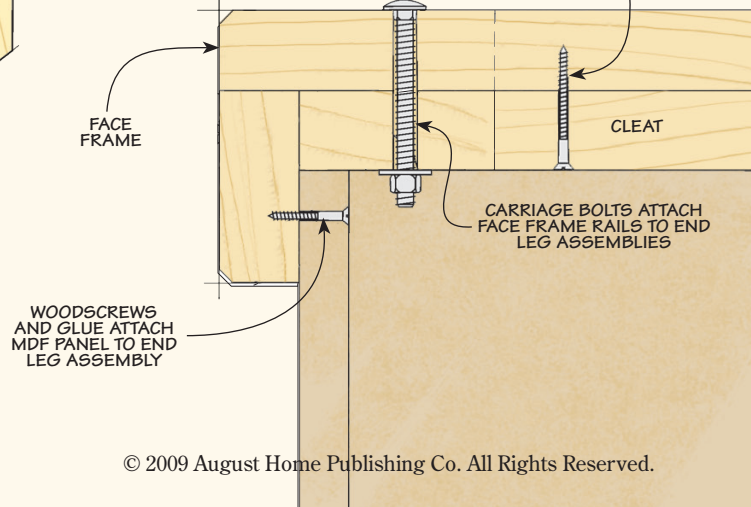
Overall Dimensions: 32" x 88" x 36"

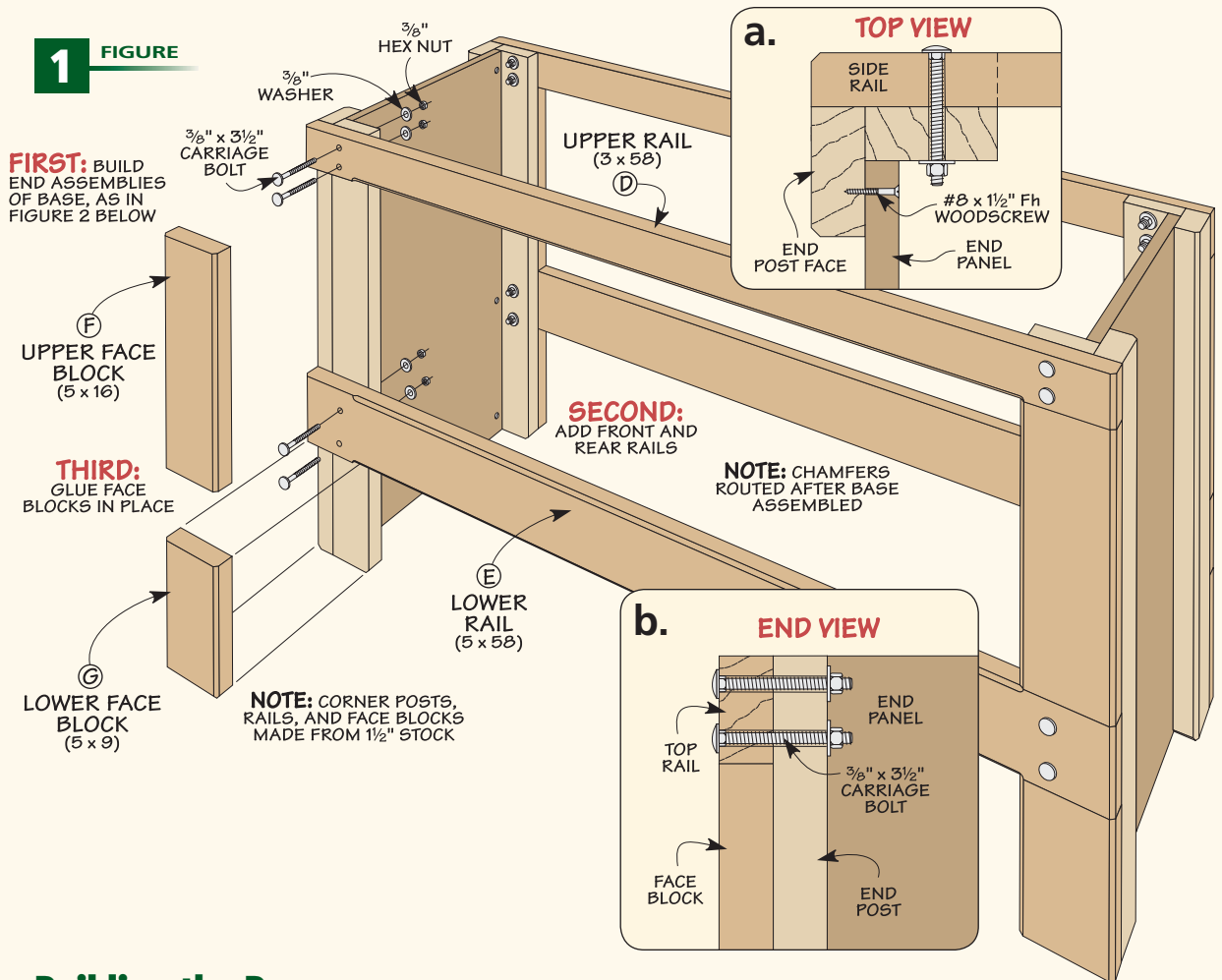


END SECTION VIEW



TOP SECTION VIEW





Building the Base

As you can see in Figure 1 above, the base consists of two end assemblies connected by four rails. And to keep things simple, the base is built in sections. I started with the end assemblies first.

END ASSEMBLIES. Unlike a traditional workbench with four legs, the two end assemblies act as the bench's legs. This does two things: First, it gives the bench a rigid base, and second, the joinery is simple.

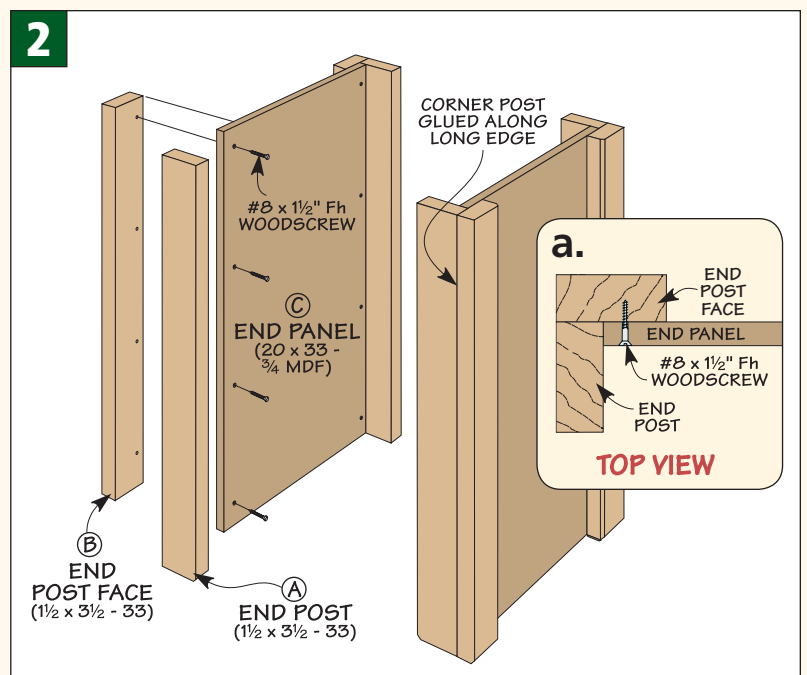
A quick check of Figure 2 shows that each end assembly is made up of a pair of corner posts connected by an MDF panel. Each "post" consists of two identical pieces that wrap around the MDF panel. To make the posts, all you have to do is line up the parts along the edge and glue them together.

When the glue is dry, the corner posts will then be ready for the MDF panels (Figure 2a). Adding the panels is a good way to ensure the assemblies stay square and stable. The panels run the full length of

the corner posts and are glued and screwed in place. With that done, you're ready to attach the rails.

RAILS. The rails connect the end assemblies to create a sturdy base.

After cutting them to size, line up the rails flush with the edges of the end assemblies. Glue and carriage bolts hold each end of the rail to the end assemblies (Figures 1 and 1a).



To provide a flat, solid surface for the benchtop, the upper rails are even with the tops of the corner posts. You can see this in Figure 1b.

FACE BLOCKS. Carriage bolts reinforce the joints pretty well, but for even more stability, I added face blocks between the rails. The blocks act like the shoulders of a mortise and tenon joint to give the framework more stability and prevent it from rocking side to side.

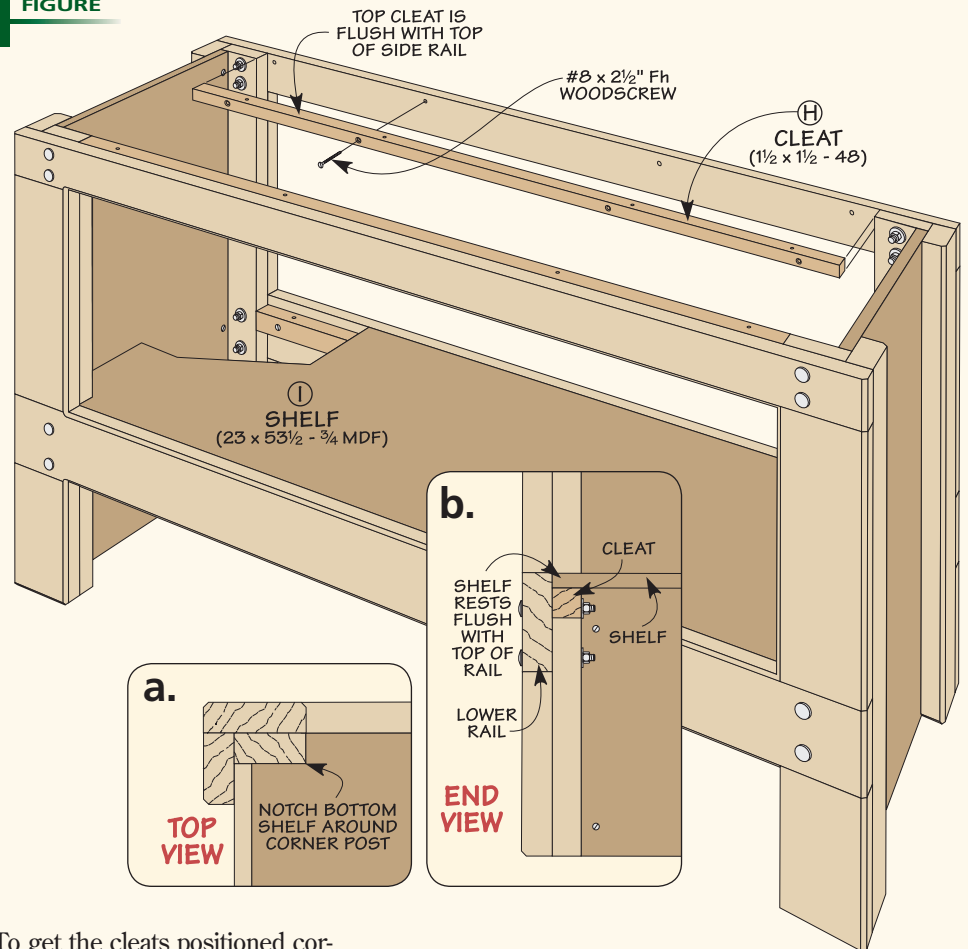
With the base assembled, you can soften the outside edges by routing a $\frac{1}{4}$ " chamfer along the edges (see lower right photo). When you get near the carriage bolts with your router, you should take the bolts out temporarily so they won't interfere with your router.

CLEATS. At this point, the base is almost complete. So now's the time to add the cleats that will hold the benchtop and lower shelf in place.

After cutting the cleats to size, I drilled and countersunk two sets of holes in them, like you see in Figure 3. The first set of holes is for the screws that hold the cleats to the rails. The second set is used for the screws that attach the benchtop and shelf to the cleats.

The top cleats align flush with the rail's top edges. But the lower pair of cleats is set below the top edge of the lower rails. This allows the shelf to sit flush with the lower rails and helps protect the edges of the MDF shelf. You can see this illustrated in Figure

3 FIGURE



3b. To get the cleats positioned correctly along the rail, I used a scrap piece of MDF as a spacer.

BOTTOM SHELF. There's one final task before moving on to the benchtop. The bottom shelf has to be cut to size, and the corners notched to fit around the posts (Figure 3a). Then, you can attach the shelf by installing screws through the cleats into the shelf.

MATERIALS & HARDWARE

BASE

| | |
|-------------------------|---|
| A End Posts (4) | $1\frac{1}{2} \times 3\frac{1}{2} - 33$ |
| B End Post Faces (4) | $1\frac{1}{2} \times 3\frac{1}{2} - 33$ |
| C End Panels (2) | $20 \times 33 - \frac{3}{4}$ MDF |
| D Upper Rails (2) | $1\frac{1}{2} \times 3 - 58$ |
| E Lower Rails (2) | $1\frac{1}{2} \times 5 - 58$ |
| F Upper Face Blocks (4) | $1\frac{1}{2} \times 5 - 16$ |
| G Lower Face Blocks (4) | $1\frac{1}{2} \times 5 - 9$ |
| H Cleats (4) | $1\frac{1}{2} \times 1\frac{1}{2} - 48$ |
| I Shelf (1) | $23 \times 53\frac{1}{2} - \frac{3}{4}$ MDF |

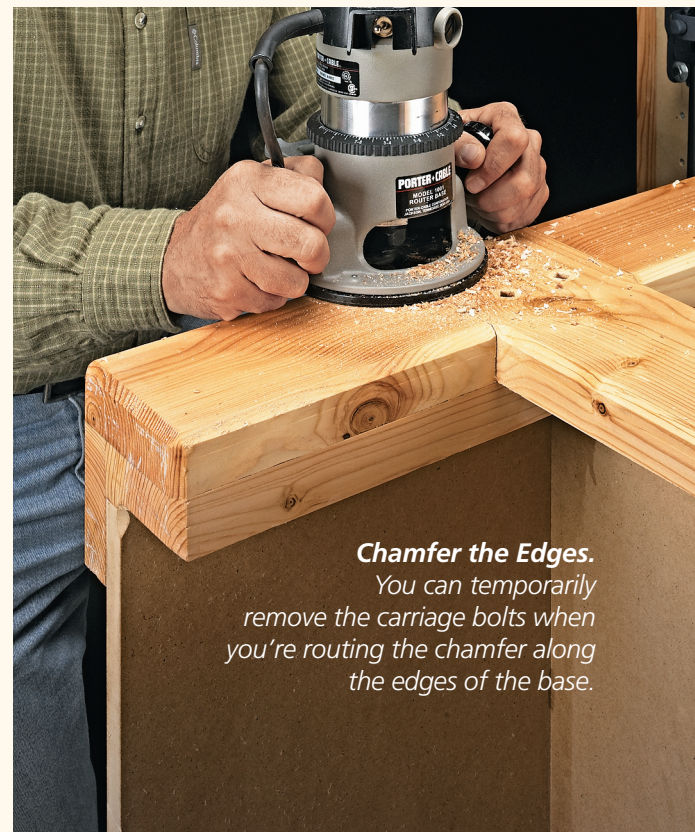
TOP

| | |
|-------------------------|---|
| J Top Layers (2) | $29 \times 85 - \frac{3}{4}$ MDF |
| K Top Edge Fillers (4) | $6 \times 85 - \frac{3}{4}$ MDF |
| L Top End Fillers (4) | $17 \times 17\frac{1}{4} - \frac{3}{4}$ MDF |
| M Front/Back Edging (2) | $1\frac{1}{2} \times 3 - 88$ |
| N End Edging (2) | $1\frac{1}{2} \times 3 - 32$ |

WISE

| | |
|-------------------|---|
| O Vise Spacer (1) | $4\frac{1}{4} \times 9 - \frac{1}{4}$ Hdbd. |
| P Vise Faces (2) | $\frac{3}{4} \times 4\frac{1}{4} - 9$ |

- (16) #8 x $1\frac{1}{2}$ " Fh Woodscrews
- (40) #8 x $2\frac{1}{2}$ " Fh Woodscrews
- (16) $\frac{3}{8}$ " x $3\frac{1}{2}$ " Carriage Bolts
- (1) 9" Bolt-on Vise
- (4) $\frac{3}{8}$ " x 3" Lag Screws
- (2) $\frac{1}{4}$ " x 1" Lag Screws
- (2) Machine Screws (For Vise Face)
- (20) $\frac{3}{8}$ " Flat Washers
- (45) #8 x $1\frac{1}{4}$ " Fh Woodscrews



Chamfer the Edges.
You can temporarily remove the carriage bolts when you're routing the chamfer along the edges of the base.



Flat Top. The benchtop has four layers of MDF, keeping the top flat and giving it strength.

Adding the Top

All the effort put into building a strong base for the workbench would be wasted if it didn't have a sturdy, flat benchtop to match. If you take a look at Figure 4, you can get an idea of how I did this.

The first thing to note is that the top is made from “two-by” stock and MDF. Why MDF? For starters, it provides a smooth, flat surface. Second, it's heavy, which adds to the stability of the workbench. And finally, MDF is affordable.

LAYERS. As you can see in Figure 4, four layers of MDF are used to create a thick top. Not all the layers are full pieces of MDF, however. Only the two top layers are full size. The bottom two layers are made from pieces of MDF.

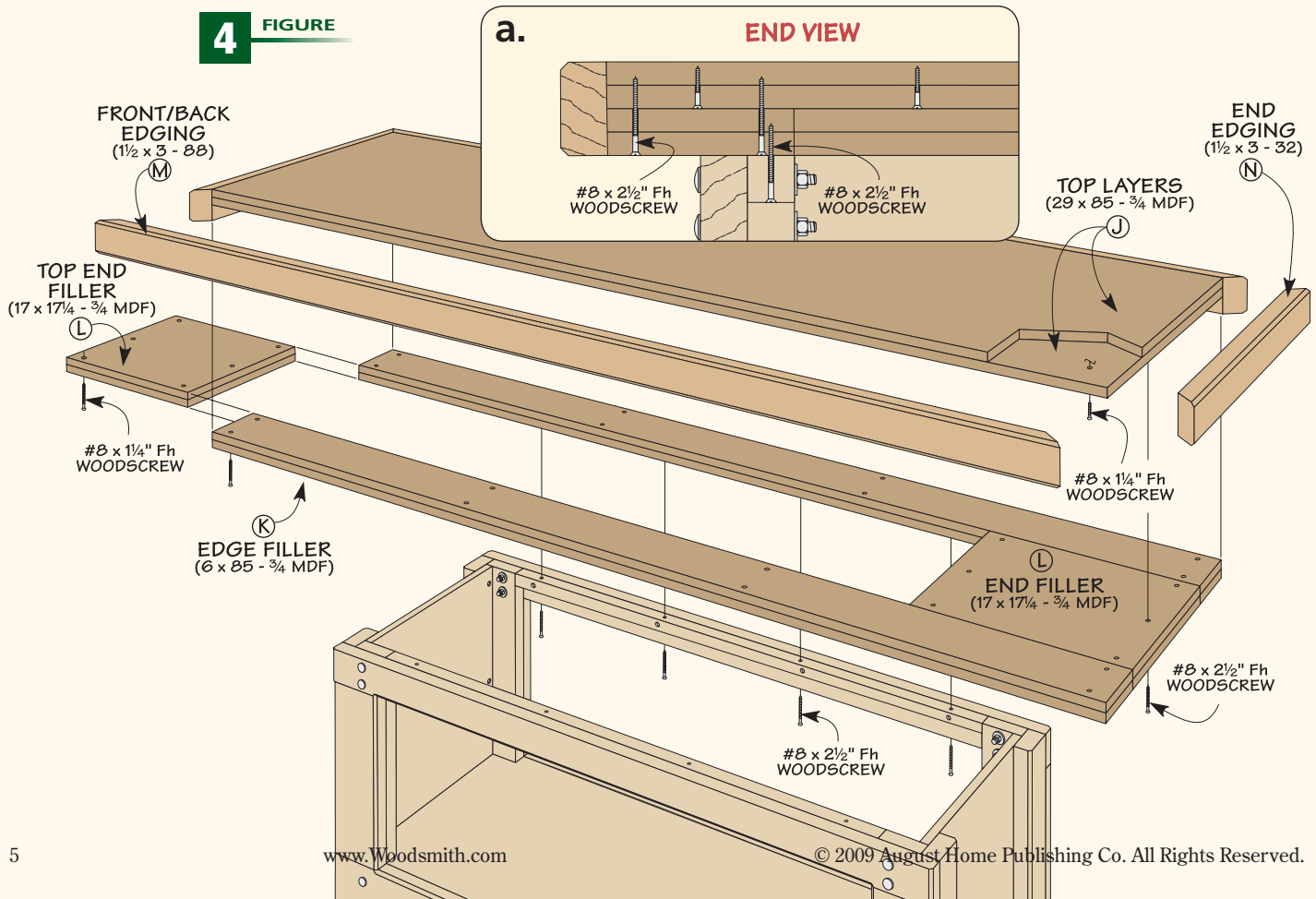
By using pieces, I was able to get these extra “layers” from a single sheet of MDF. Installing these

pieces just along the edges of the benchtop provides the extra thickness right where it's needed the most for clamping workpieces or adding accessories.

BENCHTOP ASSEMBLY. Just like I built the base in sections, I also assembled the benchtop in sections. The top two layers were cut to size and then glued and screwed together. The bottom two layers (assembled from pieces) were completed the same way. Once that's done, you can

assemble the entire benchtop. The only thing to watch here is that you keep all the edges flush. To see how I did this, turn to page 7.

EDGING. MDF edges aren't all that durable. So to protect the edges and give the workbench a more finished look, I attached edging made from “two-by” stock, as illustrated in Figures 4 and 4a. And to give the workbench a clean, finished look, this edging is wrapped around the top with mitered corners.



4 FIGURE

The challenge here is clamping the edging in place across the long top. If you don't have long enough clamps available, you can "make" longer clamps using pipe couplers or by connecting a series of clamps, as shown on page 7.

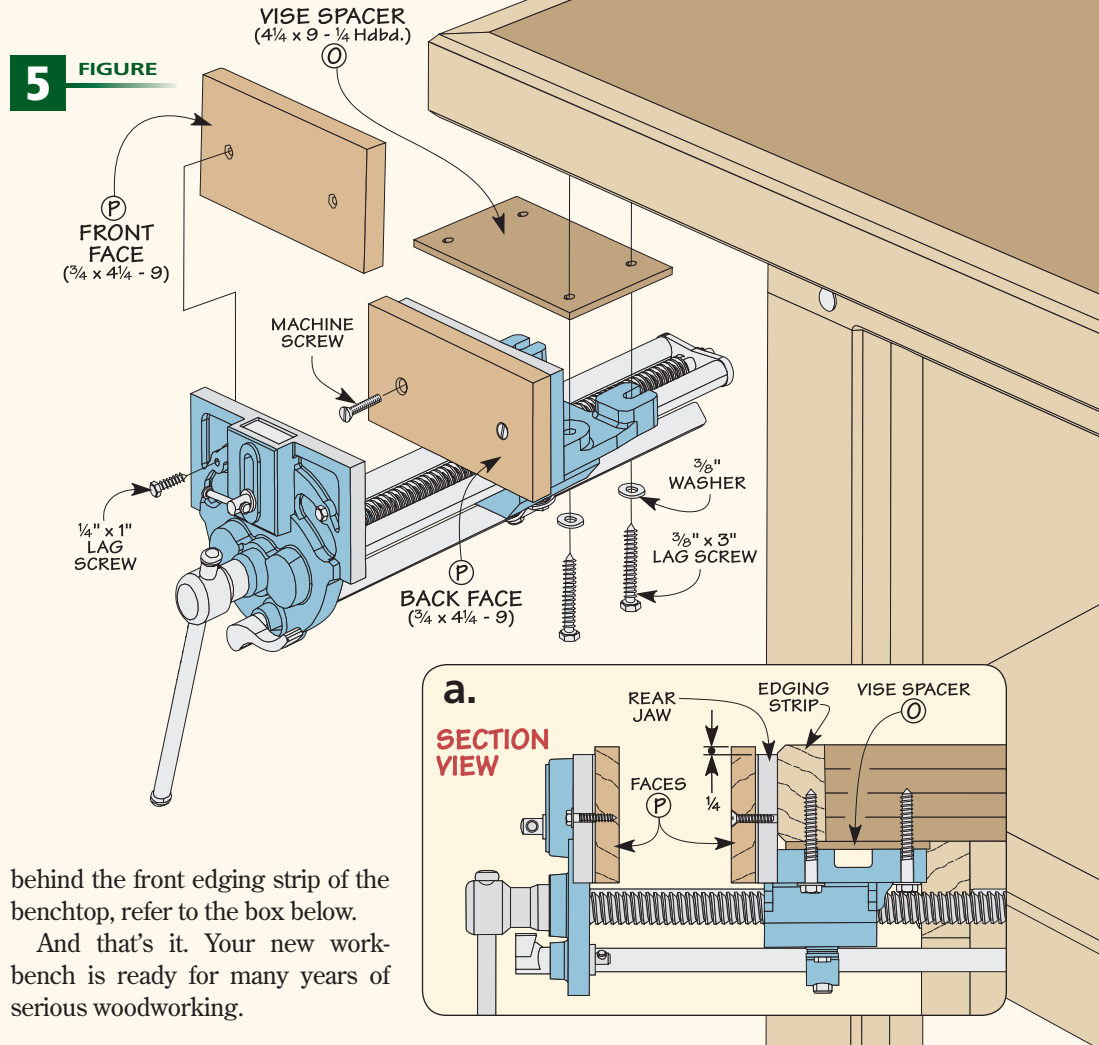
INSTALLING A VISE. The workbench is ready to use at this point. But to make the bench even more versatile, you can add a bolt-on vise, like the one shown on the previous page.

This type of vise only requires four lag screws to attach it to the benchtop (Figure 5a). Depending on the size of the vise, you may have to install a spacer between the rear jaw and the benchtop.

This spacer keeps the metal edge of the vise lower than the benchtop (Figure 5a), preventing any interference with a workpiece or possible damage to a tool. My spacer was simply a piece of $\frac{1}{4}$ " hardboard.

I also added wood faces to the metal jaws. This ensures a secure grip without damaging the workpiece.

For a "cleaner" vise installation, there's another mounting option that buries the rear jaw of the vise



behind the front edging strip of the benchtop, refer to the box below.

And that's it. Your new workbench is ready for many years of serious woodworking.

OPTIONAL VISE MOUNTING



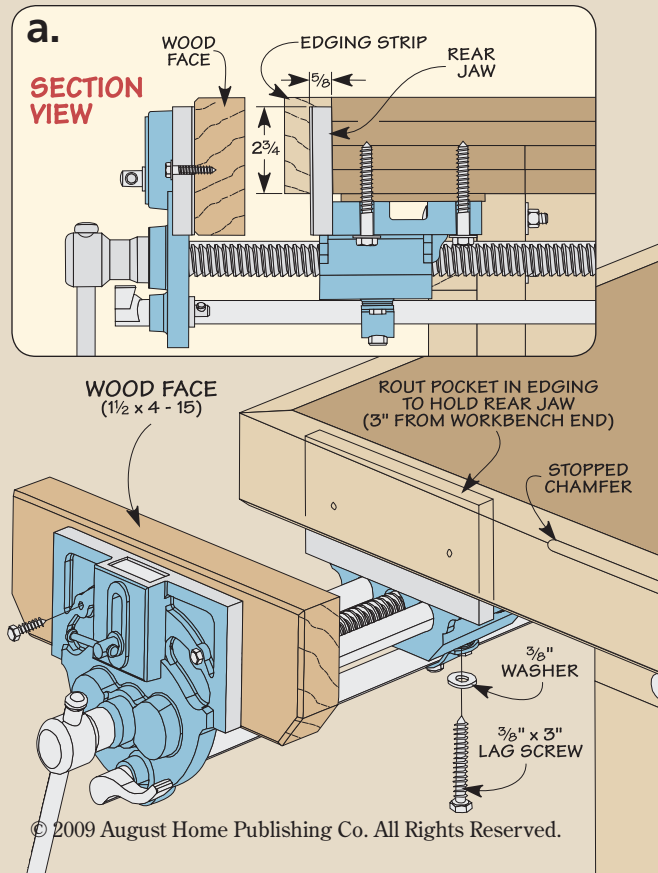
Another way to mount a wood-working vise is to bury the rear jaw behind the edging, like you see in the above photo. This allows you to clamp long pieces flat against the front of the workbench.

Installing the vise this way requires a little planning. Before

you attach the edging, you'll need to rout a "pocket" in the edging that will house the rear jaw (detail 'a').

Once the edging is installed, you can slip the rear jaw of the vise into the pocket and bolt it securely to the benchtop from underneath with lag screws. Here again, you'll need to place a spacer between the vise and benchtop, as shown in detail 'a'.

The final detail is to add a wood face to the front jaw. To match the look of the edging, the thickness of the wood face is the same thickness as the edging. The face is also longer to provide more clamping surface against the edge of the bench.





Building a Large Benchtop

A large workbench like this one presents a couple challenges, such as building the layered top and then adding the edging.

LAYERING THE TOP. The trick with the top is keeping all the layers flush

with each other as you glue them up. To do this, I used screws to keep everything aligned and act as “clamps.” Plus, working in stages makes things less hectic.

I started by cutting the top two layers to final size. Then, after clamping them together with the edges flush, I pre-drilled all the holes for the screws.

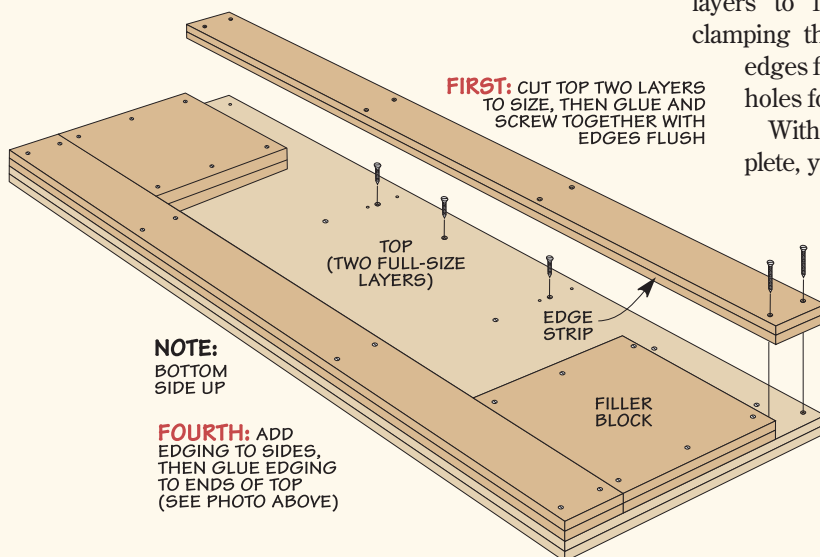
With the screw holes complete, you can separate the two

layers and spread on some glue. A slow-set glue works best here. Then it’s just a matter of “clamping” the two layers together using the screws.

To build up the other layers, I followed a similar process. First, I glued up and installed the two long strips along the outside edges of the top. Then, I sized a filler block to fit in between, gluing and screwing them in place. Be sure to stagger the screws to avoid interfering with the screws in the top.

ADD THE EDGING. At this point, you’re ready to add the edging. My problem was none of the clamps I had spanned the length of the top. If you have pipe couplers, you can simply “make” longer clamps.

For my top, I tried something different (photo above). Instead, I connected the clamps in series to create “longer” clamps that reached from one end to the other.



FIRST: CUT TOP TWO LAYERS TO SIZE, THEN GLUE AND SCREW TOGETHER WITH EDGES FLUSH

SECOND: CUT EDGE STRIPS AND FILLER BLOCKS TO SIZE, THEN GLUE AND SCREW TOGETHER

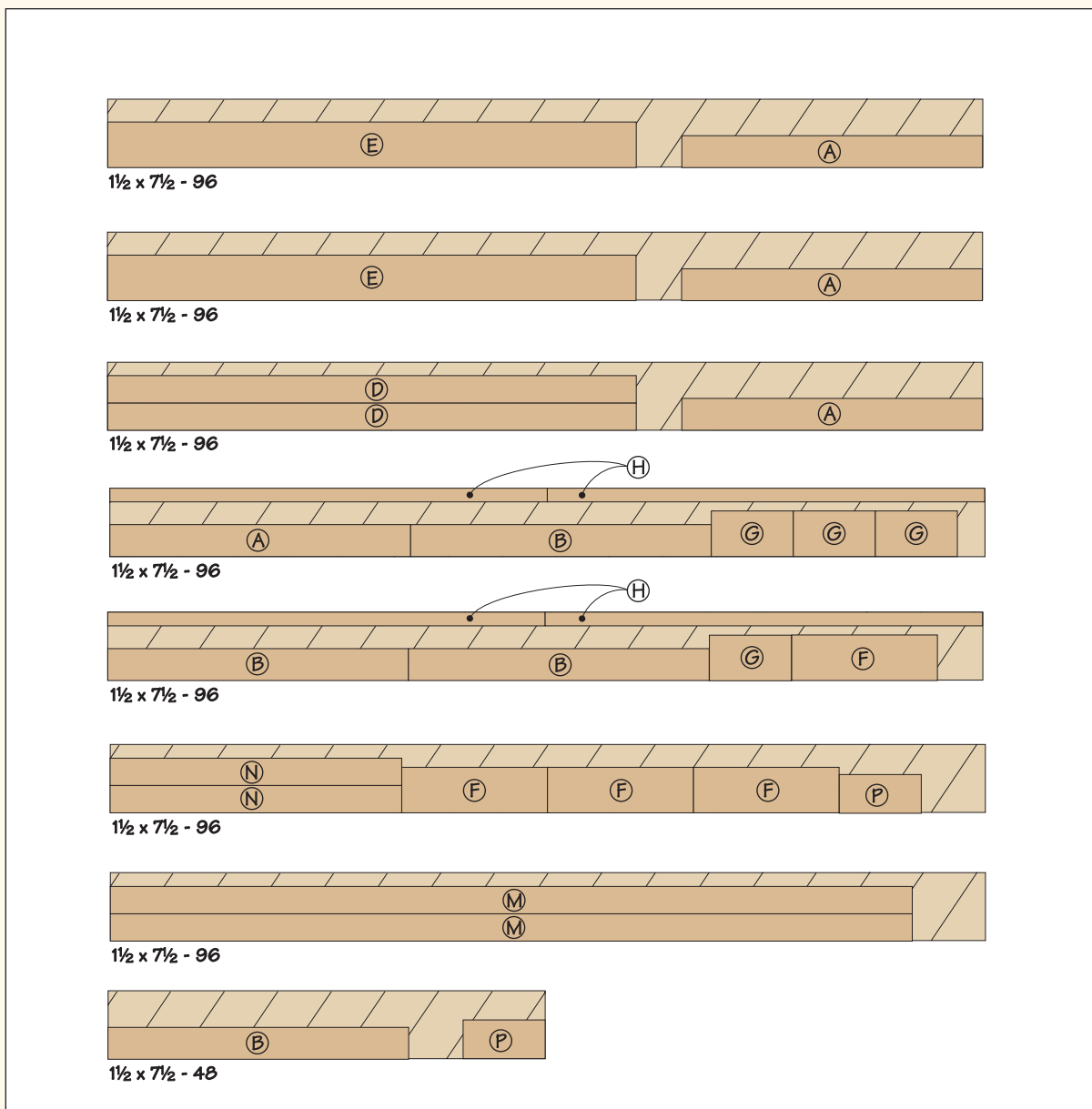
THIRD: GLUE AND SCREW EDGE STRIPS AND FILLER BLOCKS TO TOP LAYERS

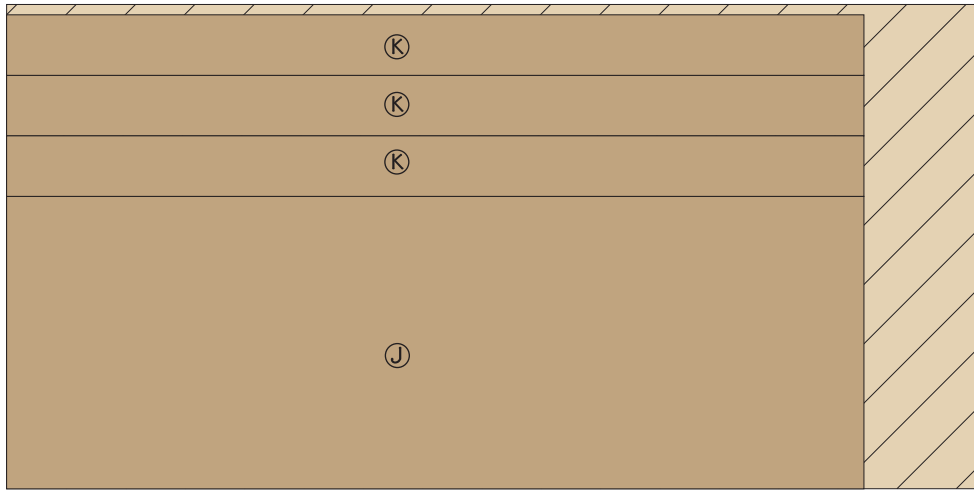
NOTE: BOTTOM SIDE UP

FOURTH: ADD EDGING TO SIDES, THEN GLUE EDGING TO ENDS OF TOP (SEE PHOTO ABOVE)

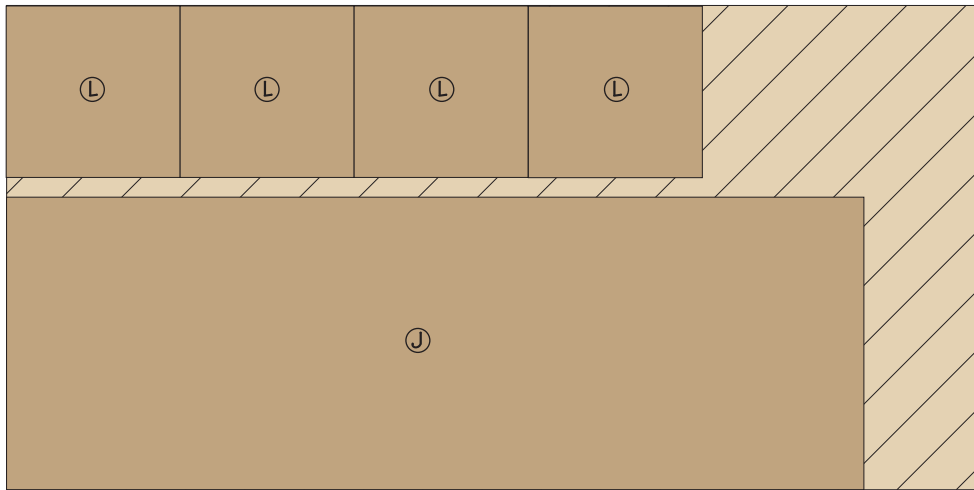
HEAVY-DUTY WORKBENCH

Cutting Diagram

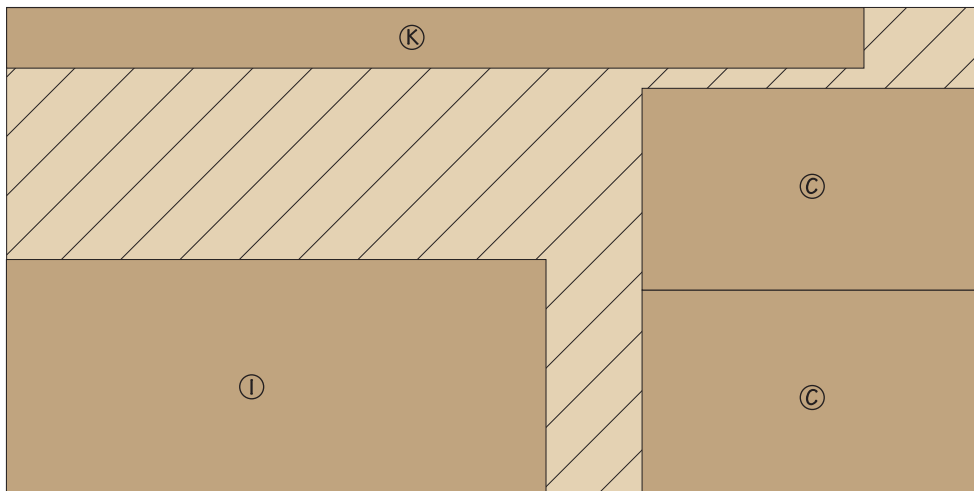




47" x 97" - 3/4" MDF



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