

## Cedar Storage Bench



### Router Bits used:

- 2 pc. Shaker Rail & Stile set (item #8837)
- 45 degree Shaker Raised Panel bit w/ Undercutter (item #8699)
- Reverse Glue Joint bit (item #7853)
- 1/2" Rabbeting bit (item #7693/5393)
- 1/8" Slot Cutter bit (item #7661/5361)
- Finger Nail bit (item #8884)

### Additional Items needed:

- Waterproof Wood Glue
- 3" Non-Mortise Hinges
- H-9 Size Wood Biscuits
- Backsaw or Dovetail Saw
- Optional: 12" Light Duty Chain (to stop lid travel)
- Optional: 2 pcs. 5/8" woodscrews to secure the optional chain

### Preparing the wood panels:

1. Referring to the parts list, glue up enough stock to create the sizes listed for the lid, front, back and side panels. It is advisable to make these oversized and trim them to the final dimensions after the glue has dried. To create strong glue joints on all of the panels, either H-9 sized biscuits or a reverse tongue and groove glue joint can be used. In our prototype, biscuits were used on the raised panels and a reverse tongue and groove glue joint was used on the bench lid. Refer to the

instructions available on our website for proper use of these bits to create the joints that they produce. Use ample glue and place the glued up assemblies into clamps while they dry. Avoid using too much clamping pressure as this may squeeze too much glue out of the joint causing the joint to fail.

### **Cutting the Rails and Stiles for the Panel Frames:**

1. Referring again to the parts list, cut the stock needed for all of the end rails, intermediate stiles and end stiles to their final dimensions. Lay out the pieces to mark each piece using a piece of tape as there will be many pieces to rout. (see figs. A & B)



fig. A



fig. B

2. Install the rail cutting router bit into your router table. You will use this router bit to make the cross-grain cuts on the top and bottom rails. You will also use this bit to rout the ends of the intermediate stiles where they intersect the top and bottom rails. A safety coping sled (items #9497/9495) will make this operation easier and safer as the narrow ends will tend to want to “dip” into the router bit opening in the fence as they come off of the in-feed fence. (see fig. C)

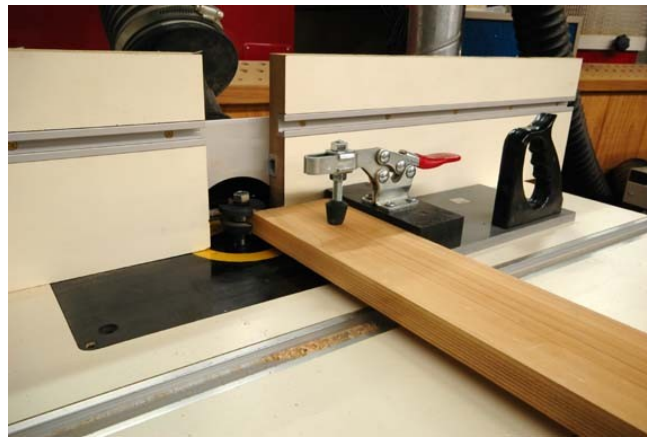


fig. C

3. Next install the stile bit into your router table. Rout the profile and slot along the length of one side of each of the end stiles, along the length of one side of each top and bottom rail and along the lengths of both sides of the intermediate stiles. (see fig. D)

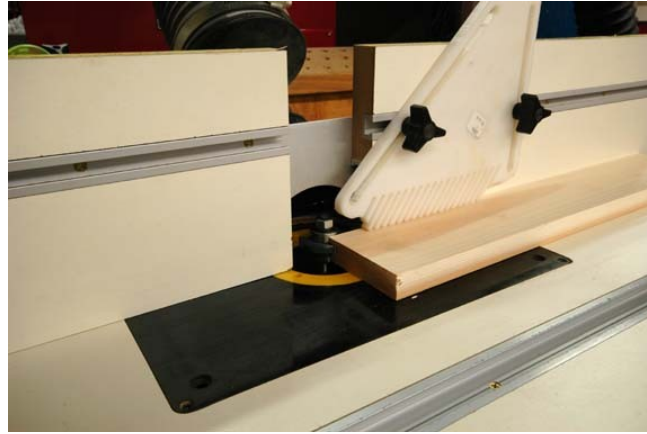


fig. D

4. Install the 1/2" rabbeting bit into your router table. Using a piece of scrap stock the same thickness as your stiles, adjust the router bit height to 1/8" above the router table.
5. Rout the top and bottom of one edge and adjust the router bit height to produce a tongue that is 1/2" thick. (see fig. E)

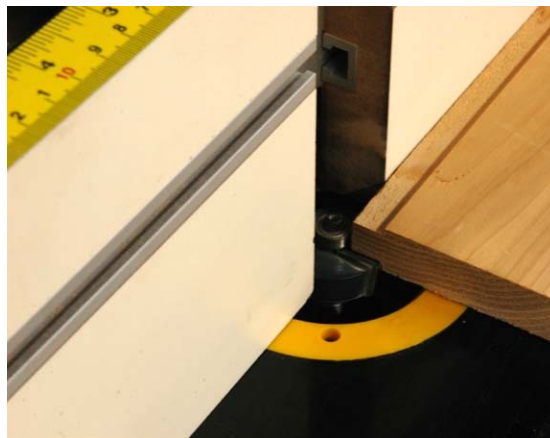


fig. E

6. When you have attained the proper router bit height, rout the long edge (opposite the profile and slot) of each end stile.
7. Using a handsaw or table saw, remove one inch of the tongue on the top and bottom of each stile. A chisel can be used to clean up any remaining wood after the stiles are notched. (see figs. F- H)



fig.F



fig. G



fig. H

### **Cutting the Raised Panels:**

1. After the glue joints on the panels have dried, remove the clamps and once again refer to the parts list, mark the final dimensions on each of the raised panels.
2. Cut the raised panels to their finished dimensions.
3. Install the Raised Panel bit with Undercutter into your router table.
4. Start by cutting across the end grain first, then making the cut with the grain to clean up any tear-out you may get. Several shallow passes will produce a better cut than making one or two aggressive passes. Because we are using the undercutter style raised panel bit, the fence will need to be adjusted between each pass as the cutter height must remain constant to create a proper tongue on the edge of the panel. (see fig. I)

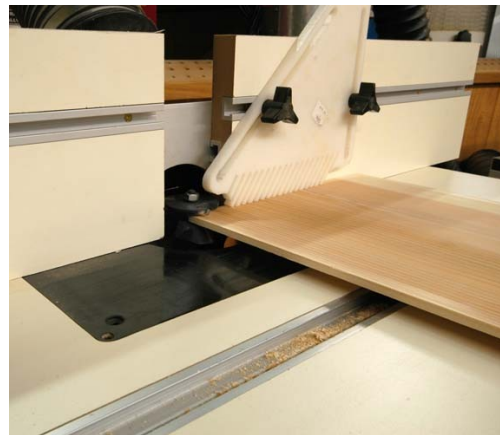


fig. I

### **Assembly of the Side Frames and Panels:**

1. Layout the pieces for each frame and panel assembly on a flat work surface.
2. Dry fit each panel to make sure the assemblies fit together properly before they get glued together. (see fig. J)



fig.J

3. Glue up one frame and panel at a time. Have your clamps ready to accept the glued up assembly as the glue sets up pretty quickly.
4. Apply glue to the ends of the bottom rail and slide the tongue on each end of the rail into the groove on each stile.
5. Slide the raised panel into the slots on each stile and the bottom rail. *The raised panel is not to be glued as it must be allowed to expand and contract due to seasonal temperature and atmospheric conditions*
6. Apply glue to the ends of the top rail and slide the tongue on each end of the rail into the groove on each stile and over the tongue on the raised panel.
7. Quickly clamp this assembly together and check to make sure that it is square.
8. Repeat for the second side frame and panel.

### **Assembly of the Front and Back Frames and Panels:**

1. Layout the pieces for each frame and panel assembly on a flat work surface.
2. Dry fit each panel to make sure the assemblies fit together properly before they get glued together. (see fig. K)



fig. K

3. Glue up one frame and panel at a time. Have your clamps ready to accept the glued up assembly as the glue sets up pretty quickly.
4. Apply glue to the ends of the bottom rail and slide the tongue on each end of the rail into the groove on each stile.
5. Slide the raised panel into the slots on each end stile and the bottom rail. *The raised panel is not to be glued as it must be allowed to expand and contract due to seasonal temperature and atmospheric conditions*
6. Apply glue to the ends of the intermediate stile and slide the intermediate stile into place, allowing the tongue on each panel to fit into the slots on the intermediate stile. Slide the intermediate stile all the way down until the tongue on the intermediate stile slides into the slot on the bottom rail.
7. Apply glue to the ends of the top rail and slide the tongue on each end of the rail into the groove on each stile and over the tongue on each of the raised panels and intermediate stile.
8. Quickly clamp this assembly together and check to make sure that it is square.
9. Repeat for the second side frame and panel.

### **Making the Bench Legs:**

1. Cut the 1-1/2" square leg stock to a finished length of 20".
2. Re-install the 1/2" Rabbeting bit into your router table. Adjust the router bit height to cut a 1/2" wide slot in the center of the thickness of each leg. (see fig. L)

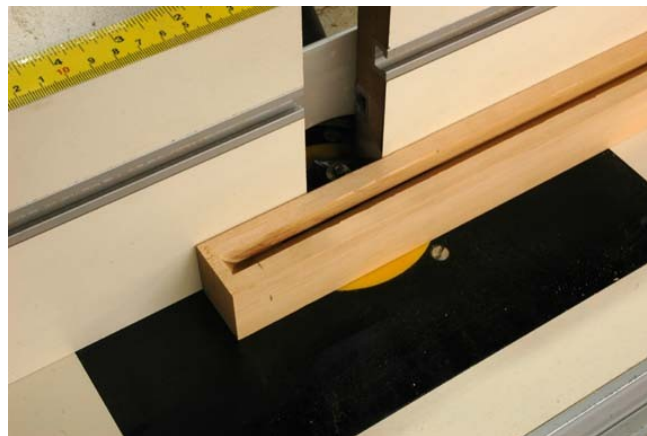


fig. L

3. Adjust the router fence to make the following cuts in multiple passes, moving the fence backward to attain the full cutting depth of the router bit.
4. Create a full 1/2" wide by 1/2" deep stopped mortise, 15" long (to accept the tongue on each end stile), on two mating surfaces of each leg.

## Assembly of the Bench Base:

1. Dry fit the tenons on the stiles into the mortises on the legs to check for fit. If needed, the tenons on the stiles may be shortened to accommodate any variances in the length of the mortises in the leg.
2. Apply glue into the mortises of all four of the legs. An acid or glue brush may make it easier to spread the glue to all surfaces of the mortise.
3. Working quickly, assemble the frame and panel assemblies into the legs and secure with clamps until the glue dries. (see fig. M)



fig. M

## Completing the Bottom of the Bench Base:

1. Cut mounting cleats out of 3/4" square stock to fit in between the legs along the bottom of each frame and panel. Glue in place and secure with clamps until the glue dries. (see fig. N)



fig. N

2. Cut the bottom slats to finished length and notch the corners of the two end slats to fit around the inside corners of the legs. (see fig. O)



fig. O

3. Place the slats in place leaving equally spaced gaps between them. The gaps are for air and any water drainage.
4. The slats can be left free floating or tacked in place with a single brad in the center of their width to allow for wood movement.

### **Making and Installing the Base Cap Trim:**

1. Miter cut the base cap trim at 45 degrees, taking the measurements from the inside corners of each leg. (see figs. P & Q)



fig. P



fig. Q

2. Apply glue to the mitered corners of the base cap trim, to the top of the legs and to the top edge of the frame and panels.
3. Carefully clamp the pieces in place while the glue dries. As an alternative, masking tape or 1" galvanized brads or finish nails can also be used to secure the base cap trim in place while the glue dries.

## Making the Bench Lid:

1. Cut the bench lid panel that was glued up earlier to final dimension.
2. Install the Finger Nail profile router bit into your router table. Cut the radius profile on only the front edge of the bench lid. (see fig. R)

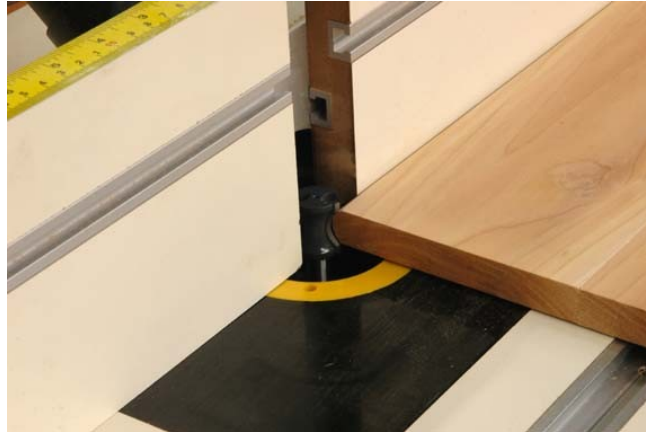


fig. R

3. Cut the back cushion retainer to length with 45 degree mitered cuts on each end. (see fig S)



fig. S

4. Cut the side cushion retainers to length with mitered cuts on the ends that will be matched up to the back cushion retainer.
5. Mark out the radii on the front edges of the side cushion retainers. Using a jigsaw or band saw, cut the front edges to shape them. A belt or disc sander will help clean up any rough-cut areas left by the saw blades.
6. Glue and clamp the cushion retainers to the back and outside edges of the bench lid panel.

## Attaching the Bench Lid to the Bench Base:

1. On the backside of the bench base, measure in 3-1/2" from the edge of the base cap trim and place a hinge there.
2. Mark and pre-drill the mounting hole locations for the hinge. A flash bit (item #9371) can be used to center and pre-drill the location. (see fig. T)



fig. T

3. Mount the hinges to the base cap trim.
4. Lay the bench base on its back. Place the bench lid, bottom side up, in front of it.
5. Place spacers under the bench base to raise the hinges to the height of the bench lid.
6. Lay the hinges in position on the bottom side of the bench lid and mark and pre-drill the mounting hole locations for the hinge. (see fig. U)



fig. U

7. Attach the hinge to the bench lid. Carefully return the bench base and attached lid to the upright position.

## Attaching the optional Lid Stop Chain:

1. Attach the chain to inside of the base cap trim using a 5/8" long woodscrew through the end link in the chain. The distance should be 7-1/2" from the back of the inside of the base cap trim. (see fig. V)



fig. V

2. Attach the other end of the chain to the underside of the bench lid using another 5/8" long woodscrew. The screw position should be 10" from the back edge of the bench lid, and 2-5/8" in from the side of the bench lid. The chain only needs to be on one side of the bench as the only purpose it serves is to limit the hinge travel of the lid. (see fig. W)

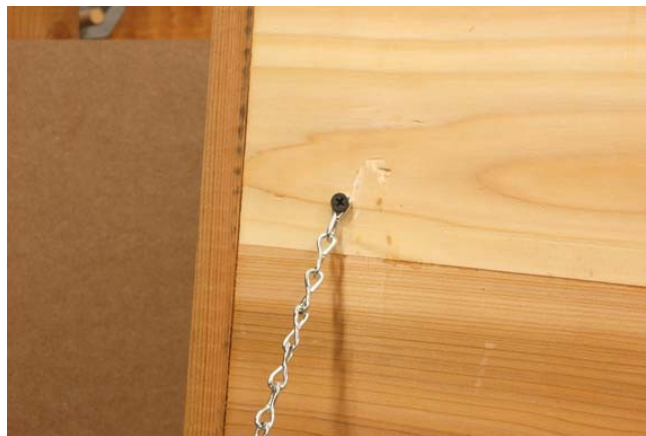


fig. W

*Your Cedar Storage Bench is now complete and is ready for final sanding and protective finish. If untreated, the cedar will attain a gray weathered finish from exposure to UV rays and weather conditions. A high quality UV protective finish will help to protect your cedar bench from exposure and prevent it from fading to a gray color.*

## Cut List for Cedar Storage Bench:

Part Description	Length	Width	Thickness	Qty.	Notes
Bench Lid	38-7/8"	17-7/8"	3/4"	1	Glued Up Panel
Cushion Retainer - Back	40-3/8"	2-1/4"	3/4"	1	*
Cushion Retainer - Sides	18-11/16"	2-1/4"	3/4"	2	*
Base Cap Trim - Front / Back	39-3/8"	1-5/8"	3/4"	2	*
Base Cap Trim - Sides	17-7/16"	1-5/8"	3/4"	2	*
Legs	20"	1-1/2"	1-1/2"	4	
End Stiles	17"	3"	3/4"	8	
Intermediate Stiles	12-3/4"	2-5/8"	3/4"	2	
Front / Back Rails	31-7/8"	2-1/2"	3/4"	4	
Side Rails	9-7/8"	2-1/2"	3/4"	4	
Front / Back Panels	12-11/16"	14-15/16"	3/4"	4	Glued Up Panel
Side Panels	12-11/16"	9-3/4"	3/4"	2	Glued Up Panel
Bottom Slats	14-13/16"	3-1/8"	3/4"	10	
Bottom Cleats - Front / Back	35-1/4"	3/4"	3/4"	2	
Bottom Cleats - Sides	14-1/8"	3/4"	3/4"	2	
					* These will be cut to finished length during construction