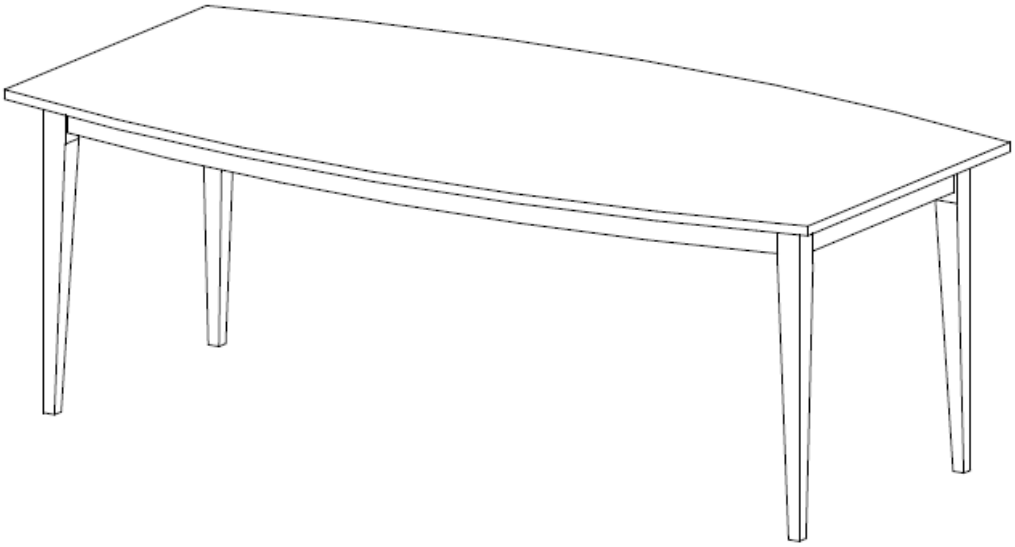
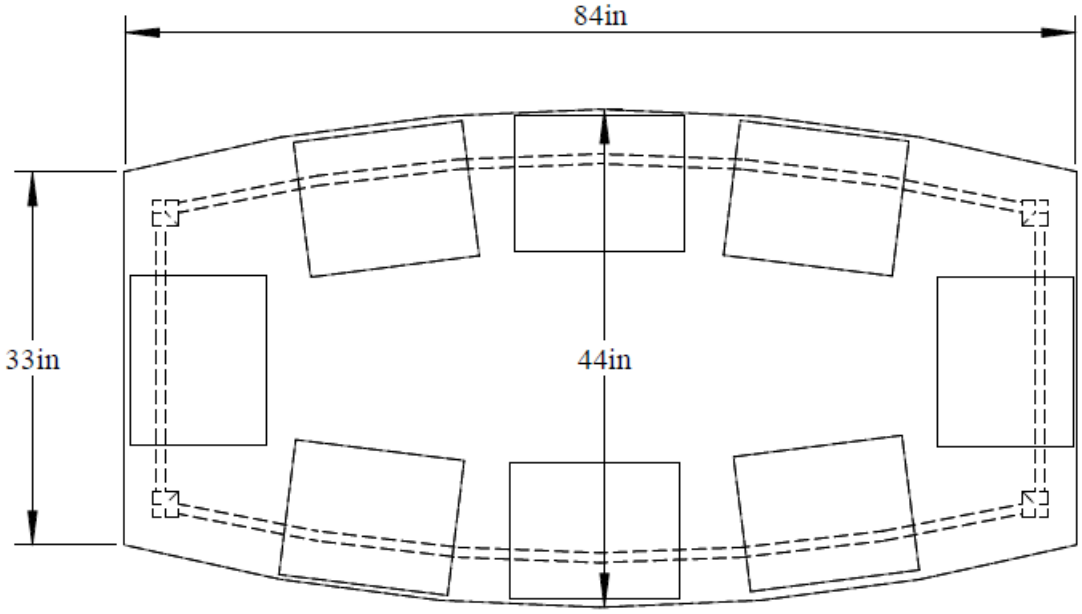
CHERRY BOAT TOP DINING TABLE

DESIGN PHASE

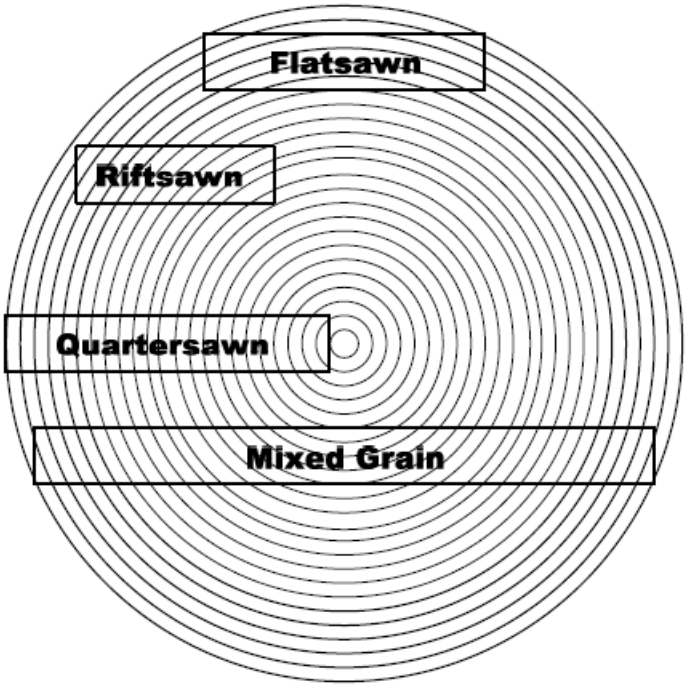
The desire was for a tabletop 84” long and 44” wide. There was concern that a rectangular top would inhibit conversation between individuals at diagonally opposite ends of the table.



A traditional “boat top” shape was requested keeping the given length and maximum width, tapering to 36” wide at the ends of the table. The overall height would remain at 30”.



The rectangles show the approximate size of placements. The design should seat eight comfortably. Dashed lines show the placement of aprons and legs under the top. (Given the amount of curve, it was felt that a corresponding curved apron would be more appropriate than a straight one.)



Given the length of the table, it was felt quartersawn and riftsawn lumber was preferred, to minimize seasonal cupping of individual pieces in the top. Additionally, given the 44" width of the table top, it would be difficult to arrive at a pleasing combination of flatsawn boards with varying arch and cathedral patterns.

LUMBER SURFACING

After delivery, the rough lumber was allowed several weeks to acclimatize to the ambient temperature and humidity of the workshop.

The table top is quite long, so surfacing of the boards was performed over several weeks. For each board one side was flattened on the jointer, the other side made parallel on the planer, and then returned to the storage rack for another ten days. Each board was jointed and planed a second time and put on the storage rack. This process allows the boards to acclimatize to ambient relative humidity and to relieve any newly exposed internal stresses, so that they will want to remain flat for generations.

MAKING THE CURVED APRON RAIL BENDING FORM

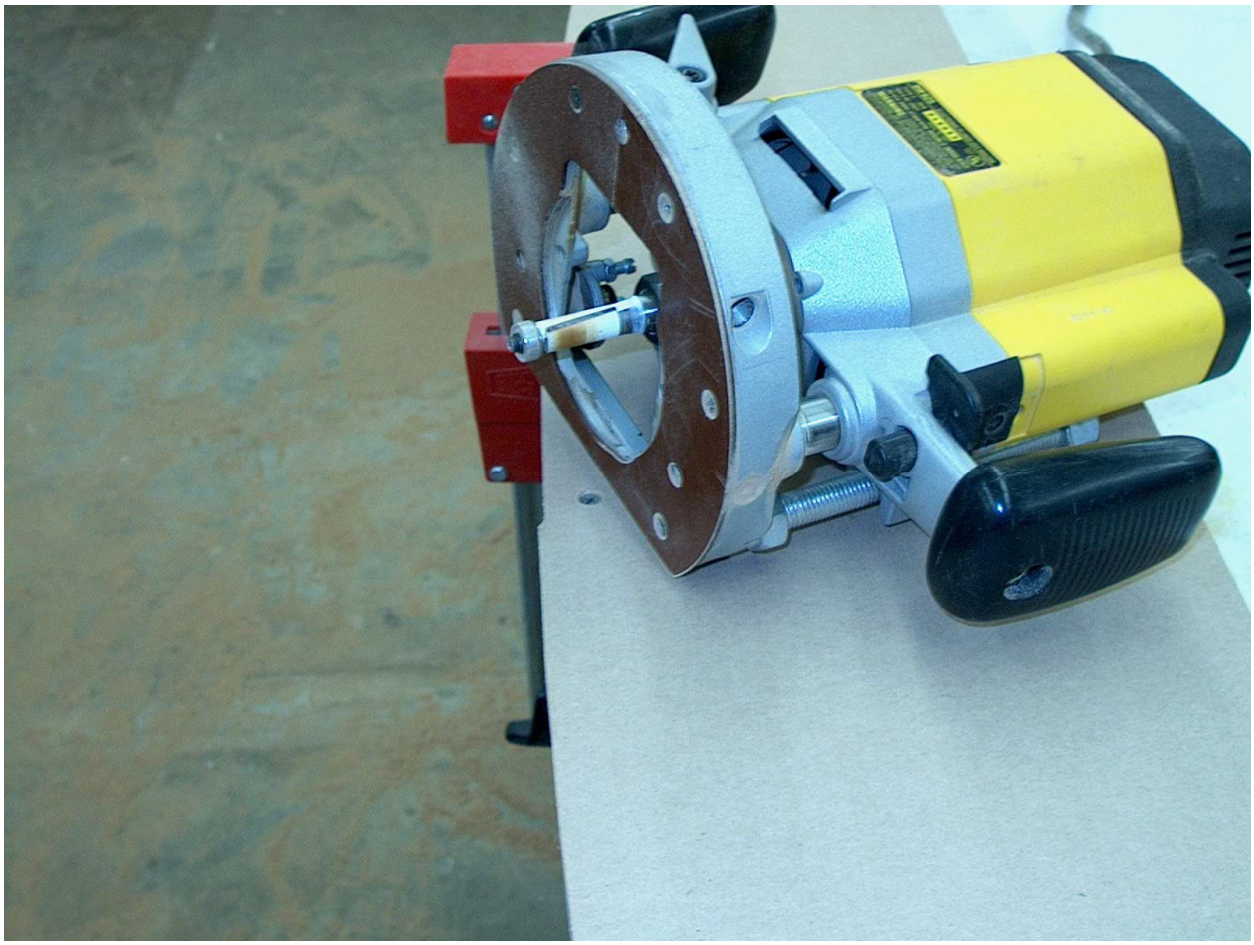
The curved rails will be made by gluing together thin strips of cherry on a bending jig. Prior to making the bending jig, a full sized drawing was needed.


10/7/09 1:52pm

In addition to the table top, the drawing shows the location of the legs and apron rails. While making the CAD drawing the radius of the table top's sides was found to be just over 13' 7". A piece of plywood held a pivot screw, joined strips of plywood became a swing arm, and curves were drawn for the sides of the table and the inner and outer edges of the apron's curved rails.

Although not shown in the picture, the inner edge of the apron's curved rail was also traced on a piece of ½" medium density fiberboard (MDF). After careful cutting out and smoothing, this piece of MDF became the **master pattern** for the curved rail.

The apron rails will be 3" wide. To allow for trimming after glue up, the bending jig was designed to be 3 ¾" wide. MDF ¾" thick was used, requiring five layers. The master pattern was traced onto a piece 96" x 10", which was then cut slightly oversize on the band saw. The master pattern was then used to pattern rout the first layer to final shape.



A second layer was cut slightly oversized and screwed to the shaped first layer. The first layer then was used to pattern rout the second.

The process was continued for three more layers. In the above picture, the curve is being traced on the fourth layer. The original master pattern is shown in front of the partially completed bending jig.

MAKING THE LEGS

Many feel the most attractive table legs, especially those with a rectangular cross section, show narrow straight grain on all four sides.

As indicated in the earlier log/lumber diagram, that occurs when the leg blank has riftsawn grain.

After looking at the CAD drawing with 1 ¾" thick tapered legs, it was felt a 2 ¼" thick tapered leg was more suited to the overall mass of the table.

The thickest available lumber was 8/4, or 2" roughsawn. Therefore it was necessary to glue together two narrower pieces to make a blank for a 2 ¼" square leg.

Some of the pieces show grain lines almost completely perpendicular to the face and some grain lines more diagonal to the face. When the grain lines are more than 60 degrees to the face, the board is quartersawn. When the grain lines are between 45 and 60 degrees to the face, the board is riftsawn. In red oak the distinction is more important, as the prominent ray flakes of mission furniture are found in quartersawn but not riftsawn lumber. With cherry, the ray flakes are less prominent and the distinction between quartersawn and riftsawn is less critical.

A glue line in the middle of a leg's side might be very distracting. A better solution is to rotate the leg blank 45 degrees in the glued lamination. This will place the glue line at opposite corners, where it will not be noticeable.

In this picture, thin masking tape was used to outline how the leg blank would be cut from the lamination. All four surfaces of the resulting blank would show fairly narrow grain lines.

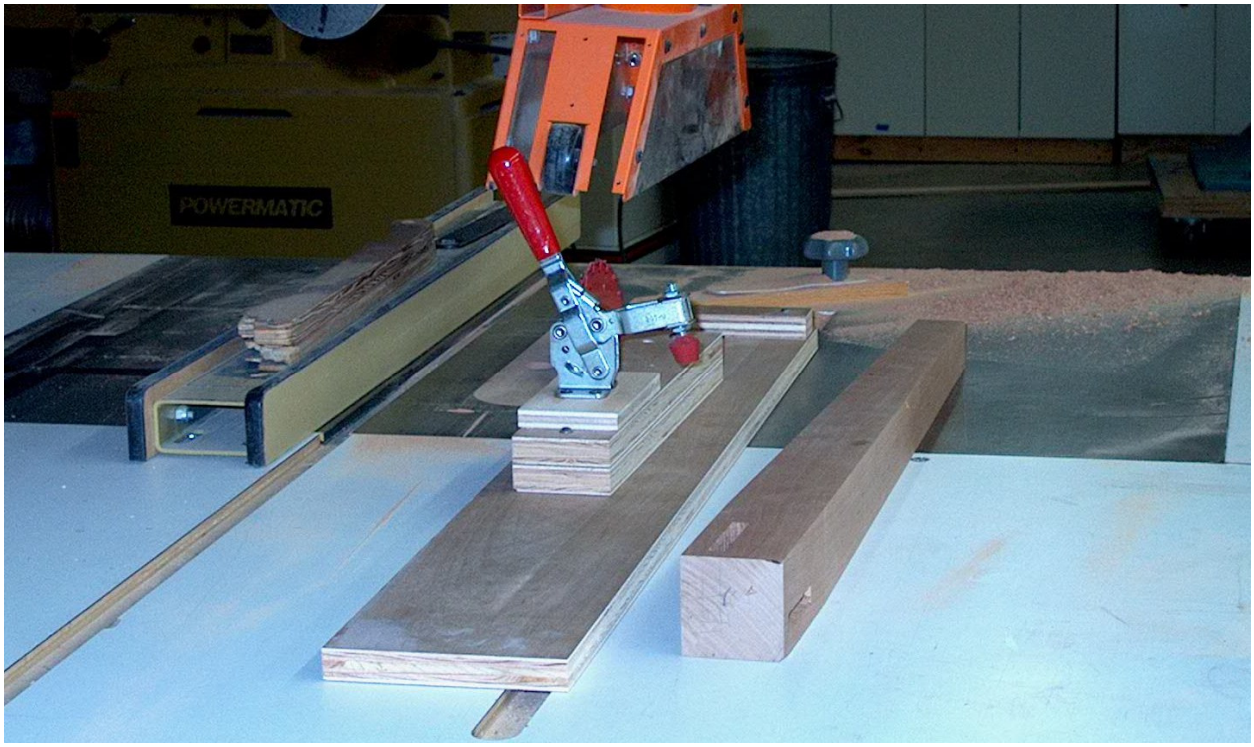
Eight pieces of cherry were cut from three boards to make the four laminations. After cutting to width, they were paired based on color. A square pattern cut from white paper was used to evaluate grain direction of the four leg faces, and the individual pieces oriented accordingly.

After the pair matches were finalized, the mating surfaces were planed absolutely flat and straight. The paper alignment pattern is visible behind the plane.

To confirm that the two gluing surfaces are parallel, position them against each other and then push the upper piece at one end. If the piece pivots easily, there is a high spot.

The glue line in the leg blanks ideally will fall on a diagonal, so it will not appear in one of the four faces. To achieve this, a pair of 45 degree cuts were made on one edge, and then parallel cuts made at the other edge.

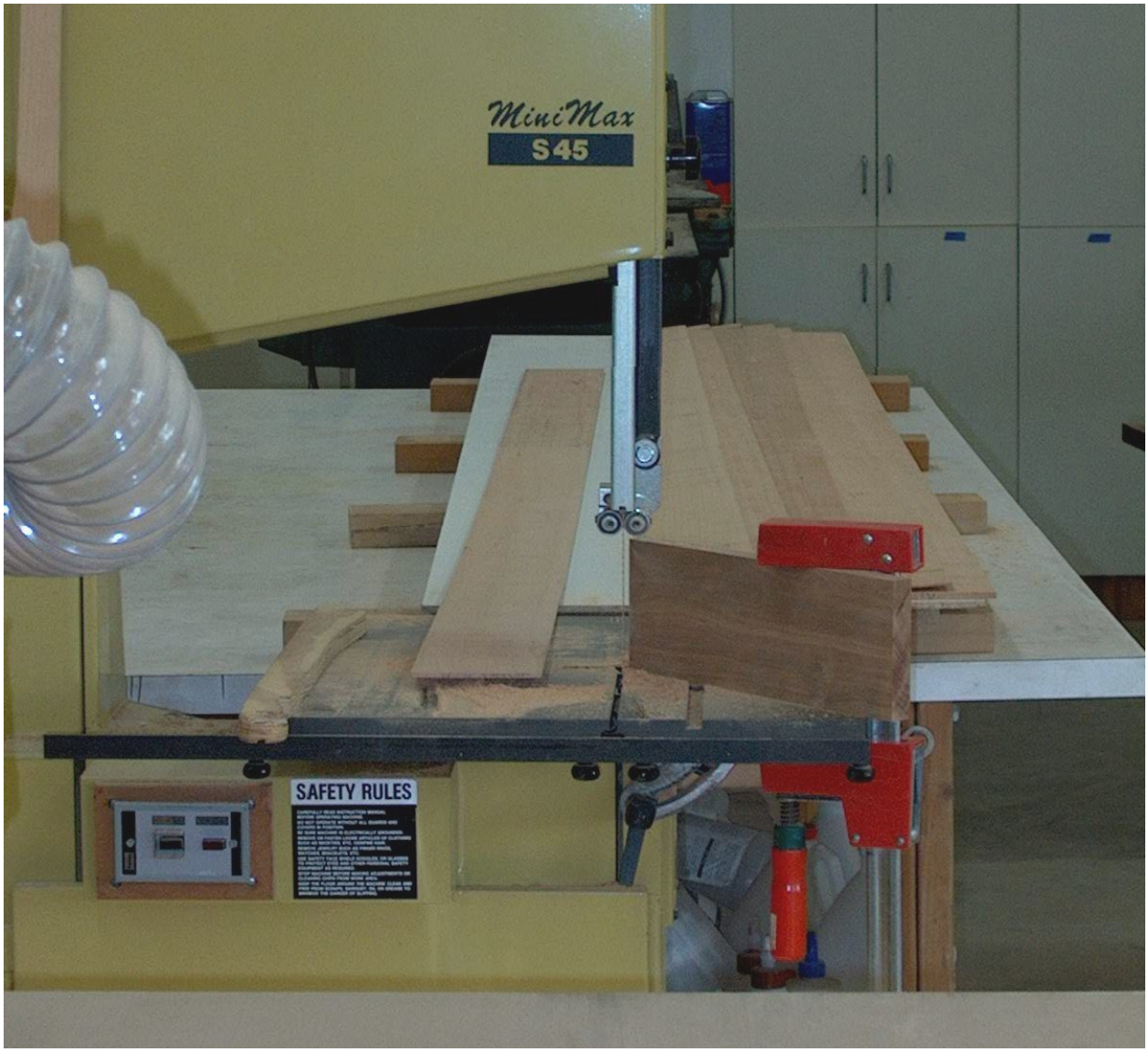
After the glued leg blanks have been squared, the mortising machine makes the mortises for the apron rails. Because the curved rails meet the legs at an obtuse angle, a jig was made and used to tilt the leg blank at the correct angle.



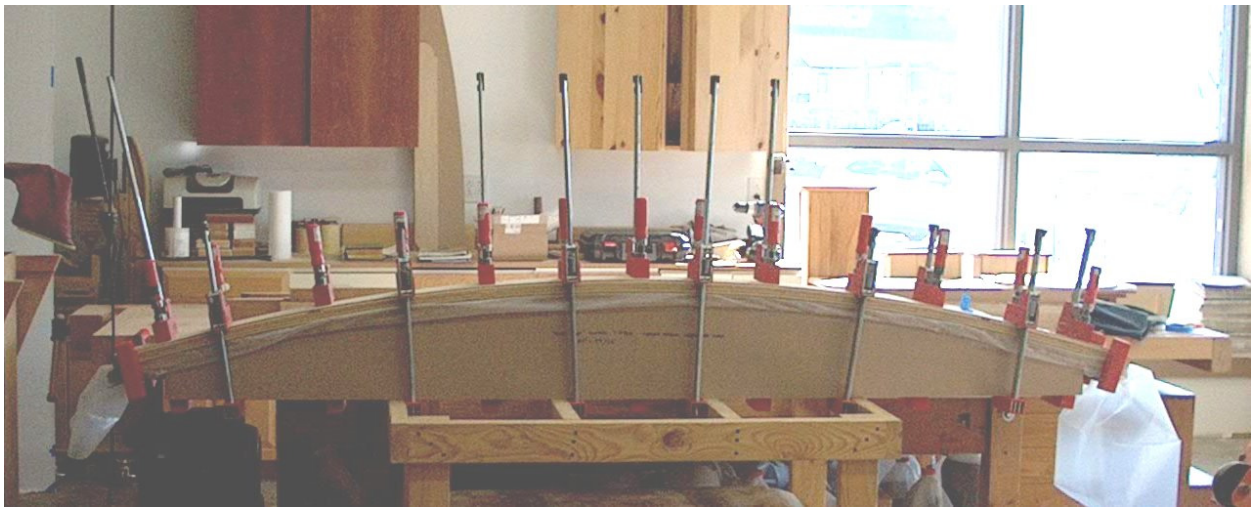
After the mortises are finished and the apron rail tenons fitted, the legs are tapered on a custom jig.

Saw marks from tapering are removed with a smoothing plane. Only light hand sanding will be needed after gluing the apron rails and legs, prior to staining and finishing.

MAKING THE CURVED APRON RAILS

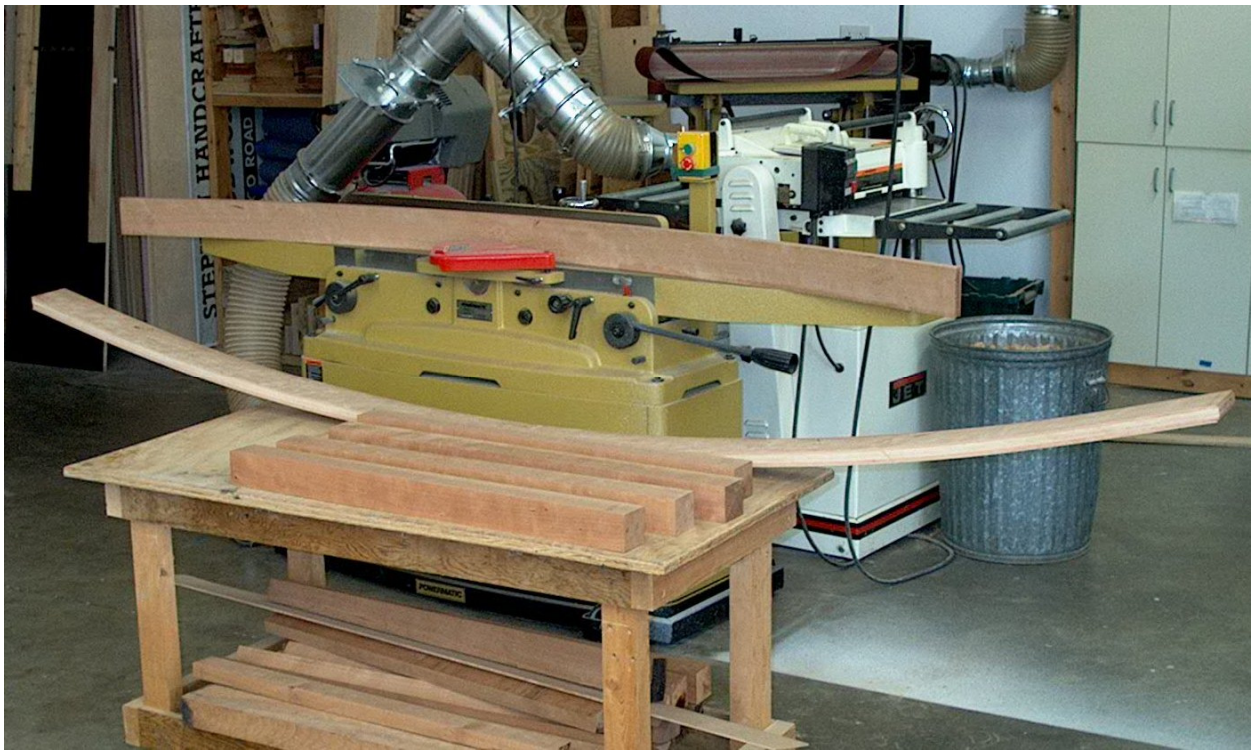


To make a strong and stable curved apron rail, straight grain boards are re-sawn into thin strips, about 3/16" thick. The clamp is holding a piece of scrap used as a fence. Behind the band saw, shims elevate a piece of melamine board on the router table to support the long strips as they are cut.

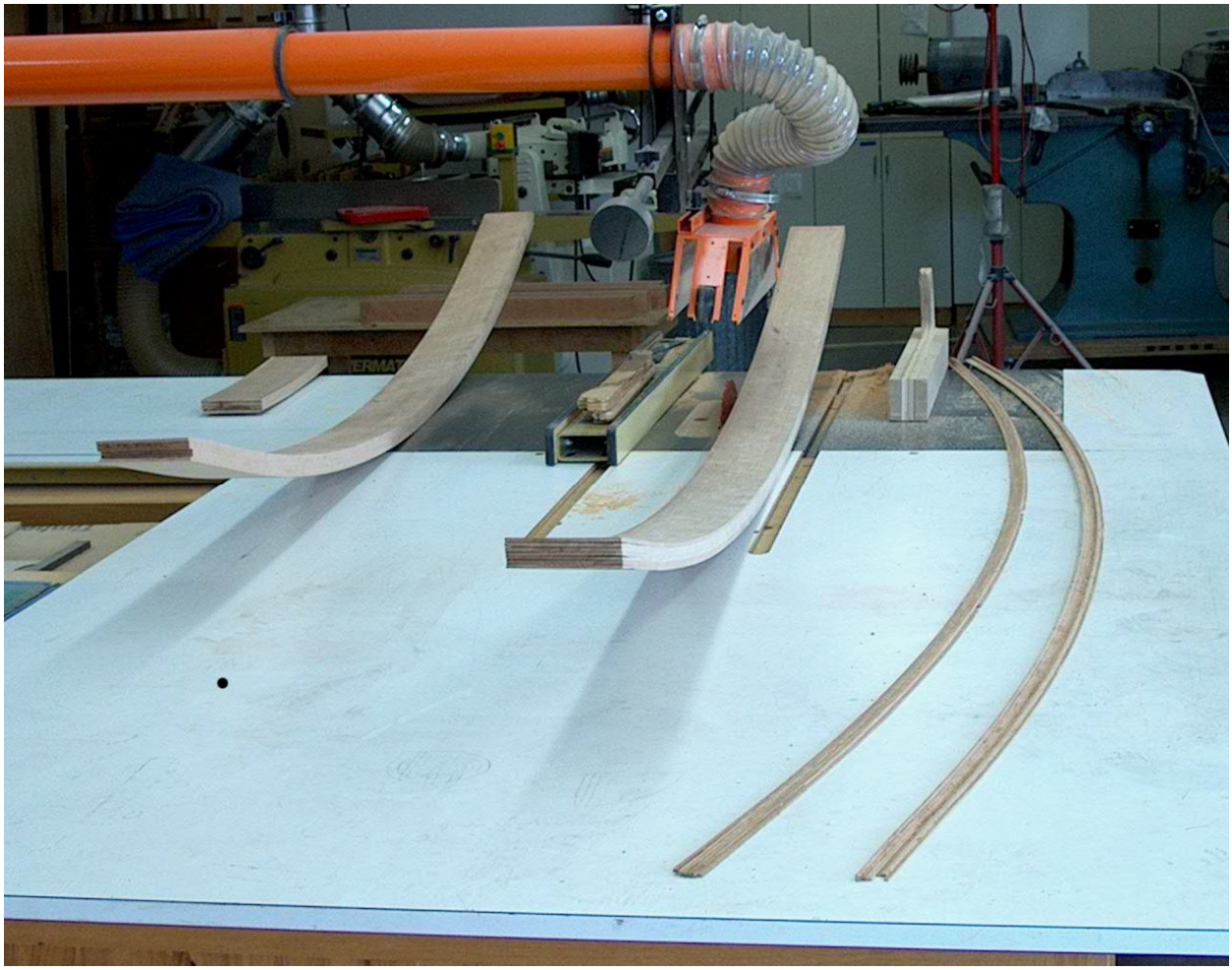


Each set of strips is glued using the bending form and a rigid glue. Typical white and yellow glues might be easier as they do not require mixing, but they are not rigid – after the clamps are removed there would be some springback.

A couple thicknesses of ½" plywood on top of the strips distributes the clamping pressure so the bend is smooth. Plastic film protects the bending form from glue squeezeout. Each curved apron remains clamped overnight.



After the glue is fully cured, one edge is made straight and square to the face on the power jointer.

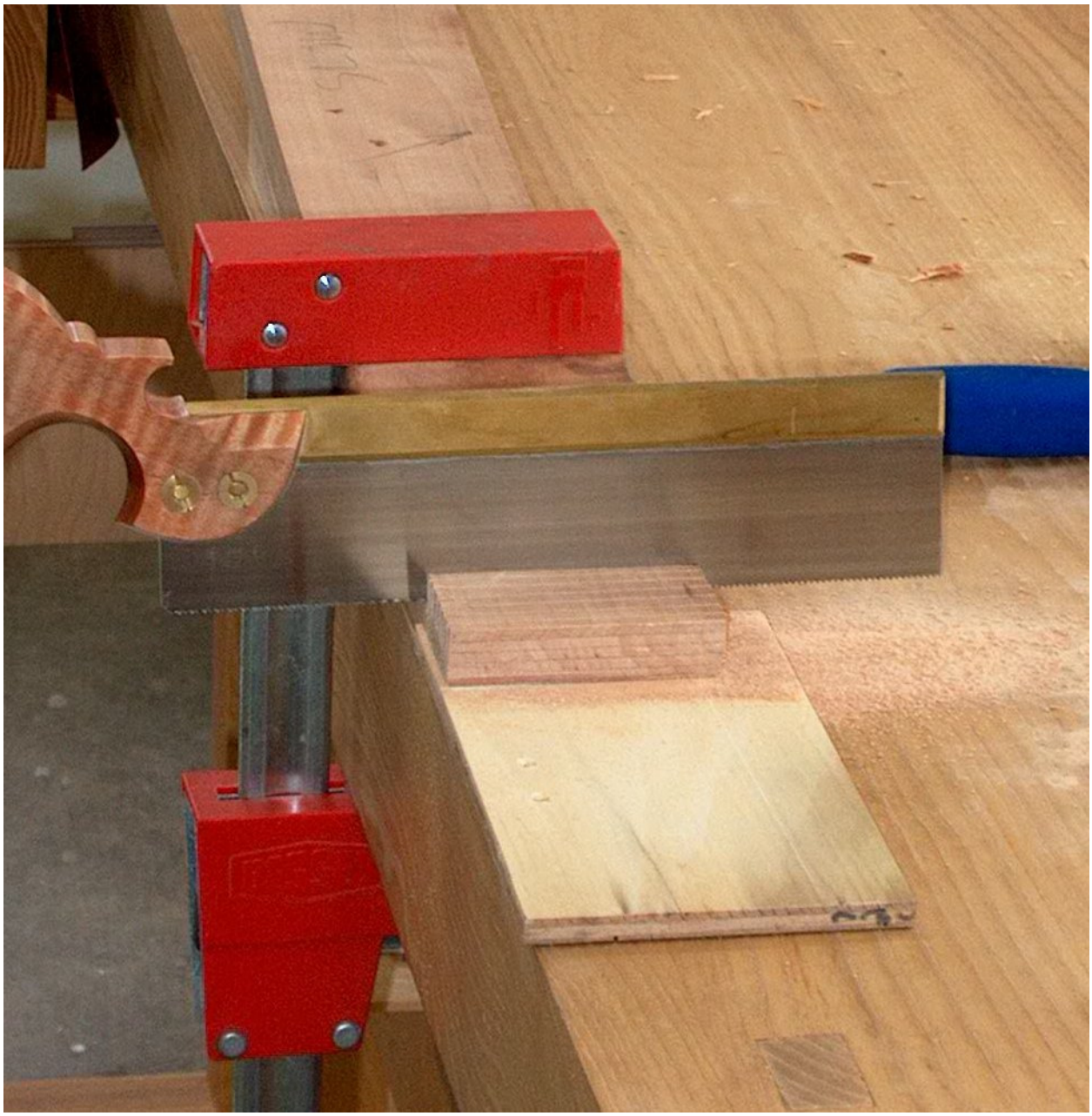


The curved aprons are trimmed to width on the table saw. The saw marks are then removed with a couple passes on the power jointer.

A full sized pattern of the curved apron end and tenon were printed from the CAD program and glued to stiff cardboard. The front edge of the curve, and the tenon, were cut out in the pattern. The curved aprons were cut to length with a hand saw and the tenon pattern marked on the apron rail with a utility knife.

The bending form was used to hold the curved apron rail. The front face was started by making a series of parallel cuts with a hand saw, and the waste removed with a chisel.

Final shaping of the front face of the tenon was effected with a rabetting block plane. The tenon shoulder was trimmed with a wide chisel and mallet.

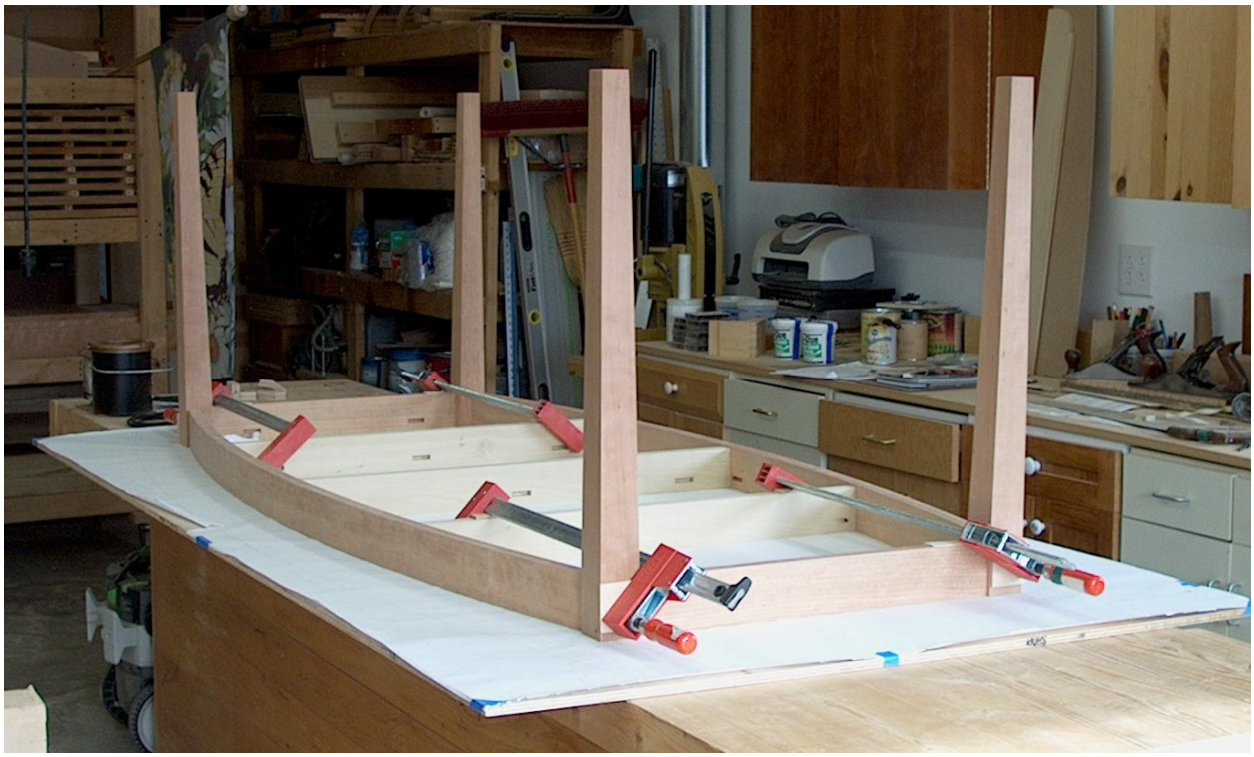


A different support block and clamp were used to hold the curved apron for work on the back side of the tenon. The width was marked, and then the back face worked to the marked line.

The tenons were shaped just slightly wider and thicker than the marked lines, and then each trimmed to a final friction fit with its corresponding leg mortise. A “friction” fit means the tenon and mortise slide together with moderate pressure. Most glues do not have significant strength in a thick glue line, so the joint needs to be tight. If too tight, the glue will be scraped from the surface when the joint is assembled. A “friction fit” leaves an ideal glue line.

It's not uncommon to find that the lines of grain will be slightly diagonal with the edge of a board. Most often, "leaning" grain looks unsettling in a piece of furniture. This board will become one of the end apron rails. The band saw removes a wedge of wood to make the remaining edge parallel to the grain lines. After jointing the sawn edge straight and smooth, the table saw will cut the other edge parallel.

After the tenons were completed, the table base was dry fit on the full size drawing to confirm the overall size and shape.



To assemble the base, the legs and (straight) end apron rails were first glued together. The next day, the curved apron rails were glued to the end assemblies. The lateral cleats, used to reinforce the base and attach the top, were first screwed to the curved apron rails. The cleats then provided a means to pull the end assemblies tight to the curved apron rails.

MAKING THE TOP

The top was made up of a number of individual boards. A lot of time was spent looking at different sequences of the various boards, to arrive at the best possible matching of color, grain and figure between adjacent boards.

After the sequence was decided and the boards numbered, each first had its edges made perpendicular to the surface and flat and straight on the power jointer. The edges were then improved with a long jointer plane.

Then groups of the boards were dry stacked and checked with a straight edge to insure that the boards wanted to lie in perfect alignment with each other.

The top was glued in three stages over three days. There were too many joints to glue in one pass without having partially cured and therefore weak joints. The entire top was clamped each day, though, so the individual boards would stay in alignment and the edges straight.

The long “cauls” help align the edges of adjoining boards as they like to slide when wet with glue and the clamps tightened.

After glueup was complete, the apron bending form was used to trace the curves of the top, and the ends were marked square. The curves were cut with a jig saw, and the ends cut with a circular saw and saw guide. Saw marks were removed with hand planes.

The top was attached to the base with L-shaped wooded “buttons” that hold the two together but allow for seasonal expansion and shrinkage of the top across its width.

The completed table, ready to begin the finishing schedule.