Beginner – Intermediate Group (BIG) Workshop Demonstration – 10/07/2017
Making a pair of hinged sawhorses – Part I, by Bob LaCivita

This BIG Workshop Demonstration was our first meeting of the 2017/18 season. Bob LaCivita returned as our host/demonstrator for another year. Our topic was a step-by-step demonstration on how to make a pair of sawhorses. Although sawhorses are rather ubiquitous most workshops, there is not much mystery in the design. A well-constructed pair of sawhorses is a versatile addition to any workshop. One less desirable characteristic of sawhorses is a tendency to get in the way when they are not being used. Storing or transporting sawhorses can be a challenge because of their inherently large footprint. The large footprint is a necessary characteristic that gives the sawhorse strength and stability. In this BIG workshop demonstration Bob shows us a clever solution to this problem.

Bob begins by talking about a few things to consider before constructing a pair of sawhorses. Sawhorses may need to be of a specific size, strength or other functional requirements that need to be incorporated in the design. Length of the leg parts will determine the height of the sawhorses. Length of the rail and stretcher parts will determine the width of the sawhorses. Overall height and width of a pair of sawhorses is typically based on how they will be used (i.e., supporting/cutting sheet stock, dimensional lumber, bench extension, out feed table extension, etc.). For this project the sawhorses will be constructed to meet Bob's needs, with his preferred working height of 30". Determining the ideal height, width, strength, etc., is entirely up to each individual.

The wood selected for this project will be some leftover pieces of birch from Bob's scrap pile. Other good wood alternatives include cedar, poplar or other relatively clear stock of approximately 2" x 4" rough dimension. When selecting the stock for this project, he looks for pieces with a minimum number of knots. He explains that the stock for this project can have some knots, but recommends close inspection to confirm that the knots are tight within the wood. We should avoid using stock with knots that have visible gaps, separation, twisting, or that are located in areas that may compromise overall strength or interfere with the joinery.

As a time-saver in preparation for this demonstration, Bob completed the millwork of the birch stock to the final dimensions of 1 1/8" x 3" and cut the boards to proper length for each of the sawhorse project's wood parts. He also constructed one of the two sawhorses in advance of today's BIG meeting to use as an assembled reference for the demonstration. He notes that at these dimensions the sawhorses will be able to support up to about 600 pounds. The number of pieces and final dimensions of the wood parts required for two sawhorses using Bob's design are as follows: 8 legs at 1 1/8" x 3" x 27"; 4 top rails at 1 1/8" x 3" x 30"; 4 stretchers at 1 1/8" x 3" x 21".

Although Bob chose to use the *Festool* Domino joining system for constructing each leg-rail-stretcher assembly, he recognized that most of us probably do not have the

Festool setup necessary for using the Domino method. Hence, in addition to demonstrating the Domino joinery system, Bob discussed in detail and demonstrated how to do the layout, cuts and assemble the joints using three other joinery techniques, any of which would be excellent alternatives. These other joinery techniques were the half-lap joint, bridle joint and the mortise and tenon joint.

Bob explained that by using the Domino joinery system, doing the layout is quick and easy. Bob explained that unlike the biscuit joinery system, the Domino system, with its thicker floating tenons, provide sufficiently strong joints for this project, whereas a biscuit joinery system, using thin biscuit inserts, would not provide adequate joint strength for the sawhorses.

Bob now proceeds to arrange two leg parts, one stretcher, and one rail on his bench, configured to make one leg-rail-stretcher assembly. The stretcher is positioned between the two legs, 8 inches up from the bottom of each leg. The top rail is positioned on top of each leg, centered to extend 1 1/2 inches beyond each leg. Bob now does the layout, marking the center points of each joint to reference the Domino jointer when he makes each cut.

Before making the Domino joinery cuts he makes sure the tool has the correct cutter bit size for the floating tenons he will be using. He then adjusts the cut depth to accommodate the floating tenons. He positions the cutter bit to cut reasonably centered mortises into the 1 1/8 inch thick parts.

After doing a dry-fit assembly and inspection to be certain that the parts fit together properly, Bob takes the pieces apart and proceeds with glue up of the four parts. Glue is added to the mortises, floating tenons and shoulders, followed by assembly of the parts into one leg-rail-stretcher assembly for the second sawhorse. Bob quickly applies clamp pressure to each leg-rail joint, followed by a third clamp across the full width of the assembly, pulling the legs into the stretcher. Bob now checks that the clamped assembly is square by measuring the diagonals before the glue sets up. One diagonal is about ¼ inch longer than the opposite. Bob slightly loosens the leg clamp for the rail-leg joint on the short side diagonal and tightens the clamp for the rail-leg joint on the long side diagonal of the assembly. He measures the diagonals once again and confirms the diagonals are equal, and the assembly is square. Bob will assemble the second leg-rail-stretcher assembly for sawhorse #2 offline. During the first part of our next BIG meeting, scheduled for December 2, he will finish sawhorse #2 by demonstrating how to install the hinge and leg stay hardware to the two leg-rail-stretcher assemblies.

Bob's demonstrations for how to layout, cut and assemble the alternative joints began with the half-lap joint. He used his miter gauge insert for his table saw to carefully cut the joint shoulders. Next, he uses the stacked dado set on his table saw, adjusted to ¾ inch, to show us how to carefully remove the waste wood while creeping up to the proper fit. He also suggested using 4-penny nails, clenched, to

provide superior strength to the joint. For the bridle joint, Bob set up a tenoning jig on his table saw to make the cheek cuts to both parts. He also used his tenoning jig to remove the waste from both parts of the joint. Last, he showed us how to make the mortise and tenon joint using his bandsaw and backsaw to cut the tenon cheeks and shoulders. He used his drill press to remove most of the mortise waste, with cleanup being done with a mortise chisel and a paring chisel. For final fitting of the tenon, Bob used his rabbit plane to shave a few thousandths off the cheeks.

Respectfully submitted by Robert Wyatt