

# Scratchbuild A Backwoods Water Tank

## Part III - Building the Water Tank

By Dwight Ennis



When scratchbuilding, it turns out that many, if not most, dimensions depend upon the dimensions of other pieces. This is particularly true when one cuts their own scale lumber, since the width and thickness of individual pieces are bound to vary. For that reason, we'll be cutting most pieces to fit after other subassemblies are completed.

### Download the Drawings

As was said previously, you'll need **Adobe Acrobat Reader**, a free program, to open/view/print these drawings. If you haven't gotten the **Adobe Acrobat Reader** yet, [download it here](#) and install it before proceeding to download the drawings.

The following drawings are for this section:

- **Drawing One - Water Tank Front View**
- **Drawing Two - Water Tank Top View**
- **Drawing Three - Water Tank Right-Side View**
- **Drawing Four - Water Tank Sectional View**
- **Drawing Five - Detail of Water Tank Supports**

After downloading the drawings, print one or more copies.

### Cutting the Tank Walls

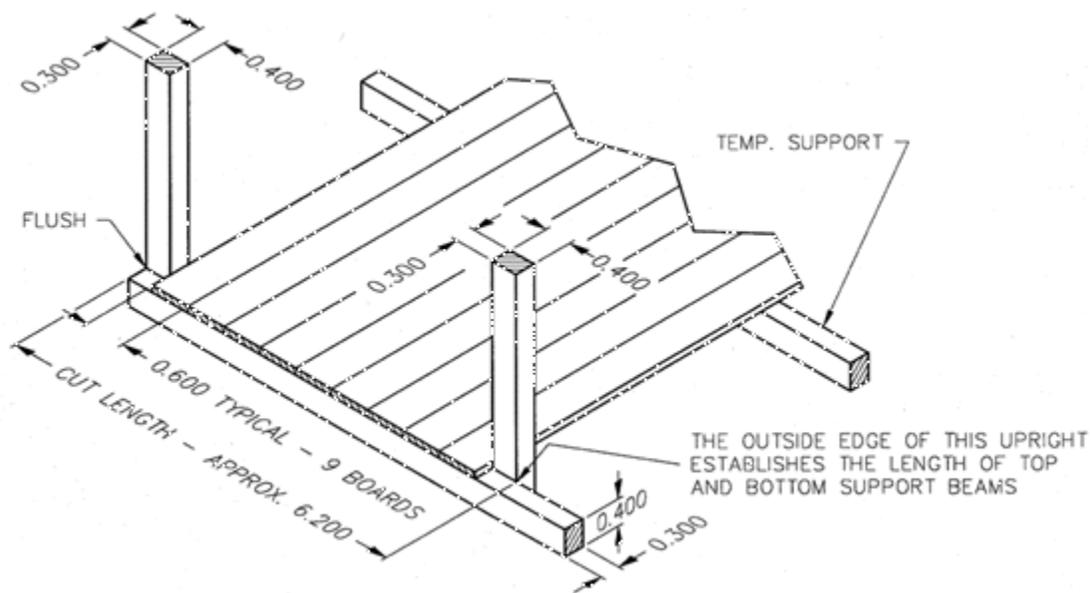
The sidewalls, top, and bottom of the tank are made from scale 2 x 12's. In 1:20, this works out to 0.10 x 0.60 x 7.00 long. Actually, the 7.00 long works out to 11'-8" in 1:20, or 11'-10.1" in 1:20.3. In cases like these, I usually round things to something that's easy for me to measure instead of using a scale 12 feet.

All told, you'll need 8 boards for each side, and 9 each for the top and bottom, for a total of 32 boards (I generally cut a couple of extras). Because we're just beginning this project, these boards can be cut to length now. Since the boards which comprise the front and rear walls of the tank will need their length sized to fit, we'll cut them later, but make sure there's enough 0.10 x 0.60 material left over for them.

## Cutting the Water Tank Support Beams

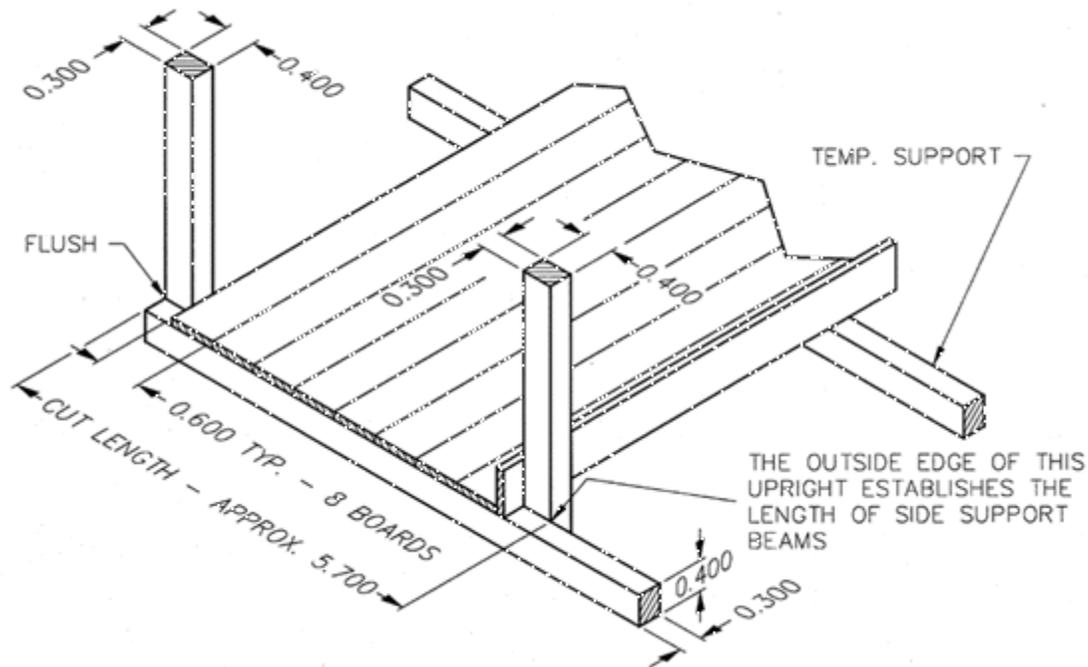
Cut up some scale 6 x 8 (0.30 x 0.40), strips. We're going to use a lot of these, so make plenty of them. Any that are left over can be used for other projects.

The first step is to establish the length of the top and bottom support beams. This is the first case we encounter where the length of one piece depends upon the widths of others. The lengths of the top and bottom support beams for the water tank will depend upon the width of your 2 x 12's which make up the top of the tank itself, and upon the width of the side support beams.



**Figure 1**

Refer to **Figure 1**. Lay two 6 x 8's on a flat surface, with the 8" (0.40) dimension facing up. Lay nine 2 x 12's on top of the 6 x 8's. Take two more 6 x 8's and hold them vertically against one horizontal beam as shown, with the 8" (0.40) sides facing inwards, and the outside edge of one of them flush with the end of the horizontal beam. The outside edge of the remaining vertical 6 x 8 marks the length of the horizontal beam - the Top and Bottom Support Beams. If your 2 x 12's are 0.60" wide, and your 6 x 8's are 0.40" in the long width, the length of the support beams will be 6.20" but fitting them this way guarantees that they won't come up short. Cut twelve 6 x 8's to the length you just established for the Top and Bottom Support Beams (again, I generally cut a couple of extras).



**Figure 2**

Next, we need to establish the length of the Side Support Beams, and we'll use a similar procedure. Refer to **Figure 2**. The main difference here is that the sides of the tank are made up of eight boards instead of nine, and that we also have to allow for the thickness of the top of the tank. Consequently, we're only going to use eight horizontal boards here, and we're going to add one 2 x 12 stood on end as shown. The rest is exactly as described above, so go ahead and establish the length of the Side Support Beams and cut twelve of them to length as well.

### **Building a Jig for the Tank Supports**

As was mentioned previously, you'll need something flat upon which to construct a jig. I actually don't often use jigs in the projects I build, but in a case such as this where several identical sub-assemblies need constructing, and where they need to align precisely later, it's the only way to go, so we'll be making a few of them during this project. We'll also use this first jig as a drilling fixture for the tank's tie rods and NBW castings.

I used a hunk of 1/2" cabinet-grade plywood that's smooth on both sides as a base for my jig. If you have a piece of something laying around that will work as well, feel free to use it. You'll need a piece that's at least 8" x 6" to use as a base. You'll also need some strips that are straight. I used some 1/2" x 1/2" pieces that were left over from when I built my trestle, but anything will work that's straight, can be cut to length, and can have holes drilled in it.

Whatever you decide to use for strips, cut a piece that's at least 1/2" longer than the Top and Bottom Support Beams. Drill a hole in it near each end and another roughly in the middle and temporarily nail it to the base so that it's approximately parallel to the long side. There's no need to be precise here. Make the hole size just slightly smaller than the nails you intend to use. This allows the nails to firmly hold the strips to the base without splitting them in the process.

Cut two more strips about 1" longer than the Side Support Beams and again drill a hole in each end. Start a nail in each hole. Butt one end of one strip against the previously-nailed strip and, using a small square, nail the piece in place so that it's perfectly square to the previous piece.



Now take two of your Top Support Beam pieces, and lay one into the jig against both strips. Lay the other along the bottom of the jig against the left strip and parallel to the other.



Take the remaining strip and butt one end against the top strip, and the side against the two Beams and nail it in place. You want it to hold the beams tightly enough so that they don't move side-to-side, but loose enough so that they'll slide out easily. Your jig is now complete.



### **Drilling the Support Beams**

With the jig now constructed, it's time to drill the holes in the Support Beams for the tie rods and NBW castings. This next step is critical to things aligning properly down the road, so work carefully and precisely.

Refer to Drawing Five - Detail of Water Tank Supports. Take one of your Top and Bottom Beams and lay out a hole on the narrow (0.30) side that's 0.15" from the edge and 0.30" from one end. Use a T-Pin or straight pin as a center punch and make an indentation to guide the drill when it starts. Drill the hole using a #53 (0.0595) drill.

Now place your jig on the drill press table. Take the beam just drilled and place it in the jig against one corner. With the drill press turned off, align the jig so that the drill bit aligns with the hole in the beam, and clamp the jig to the drill press table in this position.



Double-check your alignment after clamping to ensure that the drill bit is perfectly aligned with the hole. All the remaining holes of this type depend upon it.



With everything properly aligned and securely clamped, turn the piece end-for-end in the jig and drill the other side. Make sure to hold the piece securely against the jig when drilling. Here's another tip. Redwood has

softer wood sandwiched between harder grain lines. Even a jig won't always keep a small drill bit from walking slightly as it starts if the hole happens to align with one of these harder grain lines, or from subsequently drilling the piece at an angle. For this reason, SLOWLY start the hole thereby allowing the drill time to cut into the material where you want it to, rather than simply punching through it. Once the drill bit has started the hole, and you can see that it's placed where you want it to be, then increase pressure. Even exercising such care, the drill will invariably begin in the wrong place on some boards. If you see this happening, stop and flip the piece over to the opposite side (not the opposite end). Chances are the grain is in a different location on that side, allowing you to proceed. If all else fails, throw the piece away and replace it with one of the extra pieces you cut.

Drill the remaining Top and Bottom Support beams - one hole on each end on the narrow side (pay attention here - it's easy to make a mistake and drill the wide side accidentally - I speak from sad experience). Also drill all the Side Beams, again on each end of the narrow side.

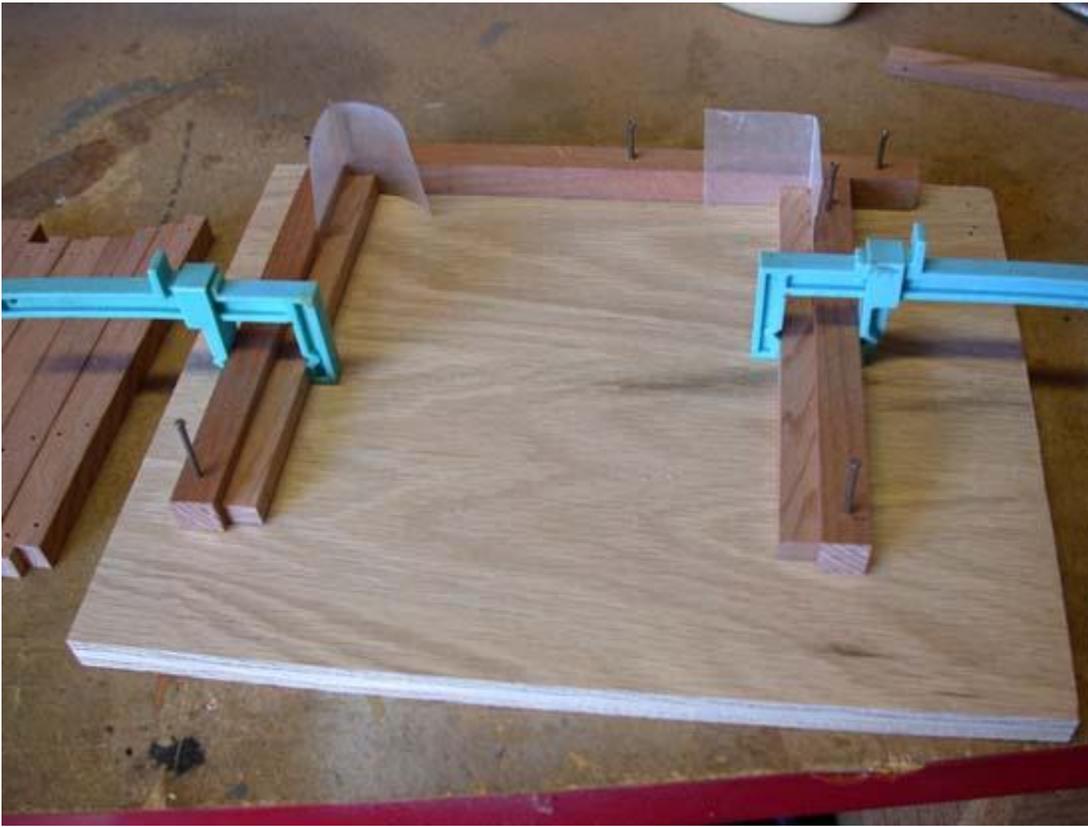
You're now finished drilling the Top and Bottom Beams, but the Side Beams need one last hole. On the narrow side, lay out the third hole so that it's 0.15" from the edge and 1.50" from the hole towards one end, or 1.80" from the end itself. Mark it, drill it, align and clamp the jig, and drill the remaining eleven Side Beams just as before.

You may have noticed by now that we haven't done anything about the Front and Back Support Beams. This is because their length needs to be established later in order to get a good tight fit. Don't worry about them at this point - we'll get around to them later.

## **Building the Initial Tank Frame**

"What?" you say? "We're finally going to glue something?" Yes, it's about that time. It was necessary to drill all the Beams first because there's no way it could be done later. I actually started constructing the tank on my first go around, and was well over half-done before I realized this. As I said before, if you screw up, throw it away and start over. I had many hours of work into my first attempt, but I still had to do just that - throw it away and start over. Advance planning isn't always my strongest point.

Back to the work at hand. Get some wax paper and cut a couple of small rectangles about 1" x 2" or so, and fold them in half. Place two Side Beams, wide side up, and with the third hole nearest the bottom, into your jig against the side strips with the top end butted against the top strip, wedging the wax paper against the top corners, and clamp them in place. I'm using a couple of small X-Acto clamps for this. Since the Side Beams are not symmetrical due to the third hole, double-check it's location now as being furthest from the wax paper and the top.



Now as for what glue to use. I use Titebond II for wooden structures. It's water-resistant, though not waterproof, but it will hold things together unless they're submerged. It's easy to use and apply - about the same as Elmer's White Glue, but it holds better. If you want to use something else, that's fine. Just make sure it won't fall apart if it gets wet.

Whatever glue you decide to use, it needs to be used somewhat sparingly. If you use too much, it's going to squirt out when the pieces are clamped, marring the finished model. On the other hand, if you don't use enough, the model will fall apart, or at the least will be very fragile. This is one instance where I can't tell you exactly how much to use. You may need to practice with a few scraps before proceeding here. I can tell you that I apply the glue, then spread it with my finger to a thin film, meaning that the area isn't dry. I also use my finger to wipe along the edges in a diagonal fashion, and always wiping towards the end and not towards the center. Wiping the edges helps to ensure that the glue in the center has room to be squeezed without seeping out along the edges.

With that being said, apply glue to one wide side of a Top Beam at each end. Don't get the glue further back than the width of the Side Beam that you're gluing to. Position the piece so that it's against the jig's top strip before touching the Side Beams. You don't want to smear the glue where it isn't wanted. Once positioned, press the Top Beam against the Side Beams. While holding the Top Beam against the jig's top strip, clamp each joint with a couple of small c-clamps. The clamps need to be tight enough to put pressure on the joint, but not so tight as to leave an impression in the Beams themselves once removed. Look for excess glue in the exposed corners and carefully remove it with a toothpick or scrap of wood. Allow this assembly to dry for whatever time period is specified on the label of the glue you're using - with Titebond II, it's one hour minimum. Don't be in a hurry here. Give the joint adequate time to cure, or the model may fall apart later. This is one area that sets building models for outdoor use apart from those built for indoor use.



Once the glue has dried, remove the beam assembly from the jig. The wax paper has kept any glue that squeezed out of the joints from gluing the assembly to the jig itself. This is the time to inspect the joints for excess glue on the outside edges, and scrape or sand away any that you find.

Build five more beam assemblies just like the first.

We now need to drill more holes. Doing this after assembly instead of before ensures better alignment. On the Top Beam's wide side, lay out a hole on the left end that's 0.20" from the end and 0.20" from the top edge. Again use a pin and make an indentation to start the hole. Drill the hole and place the assembly back in the jig. As before, align the jig so the drill bit aligns with the hole and clamp the jig in place.



Remove the assembly from the jig and lay a Bottom Beam across the bottom to support the Side Beams.



Turn the assembly over, reinsert in the jig, and drill the other end.



Drill the remaining five assemblies in the same manner.

Insert an assembly into the jig with the bottom side against the top strip. Holding the Side Beam against the side strip, drill the bottom end of the Side Beam. Repeat for remaining five assemblies.



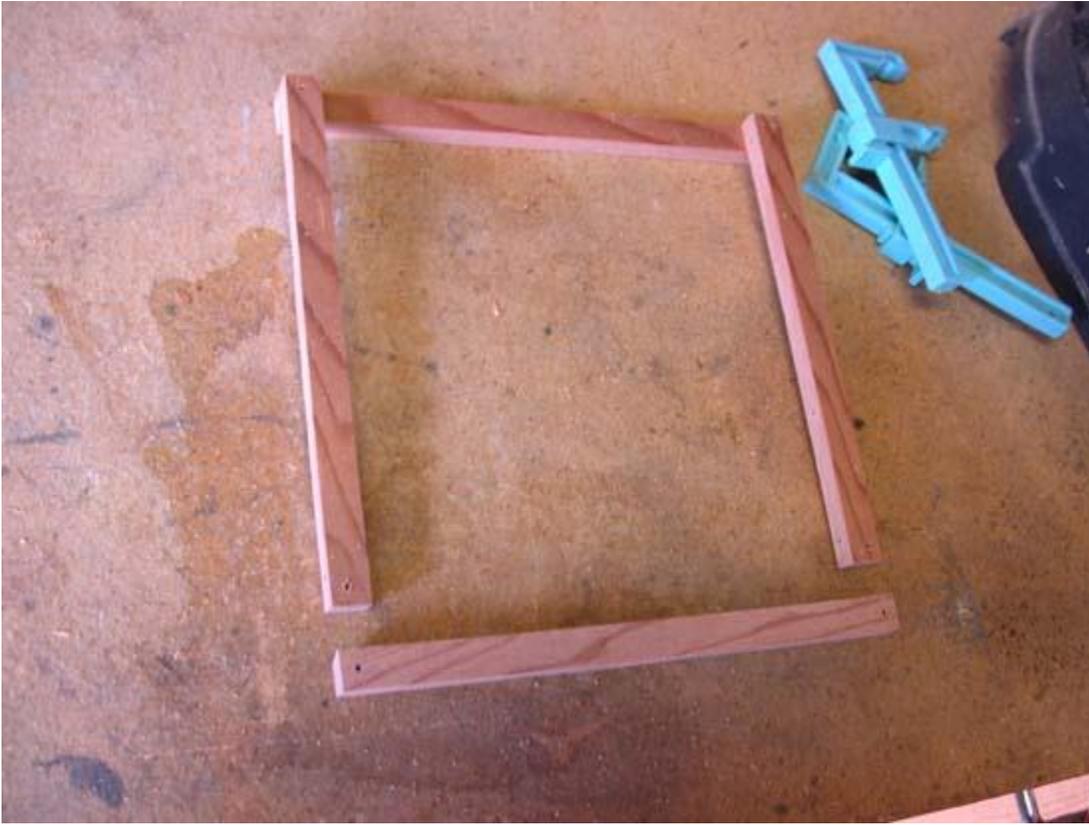
Next, place one of the Bottom Beams near the top strip to support the Side Beams, and drill the remaining Side Beam. Repeat for remaining five assemblies.



Finally, insert a Bottom Beam, wide side up, against the top strip and drill the end. Flip it end for end and drill the other end. Repeat for remaining five Bottom beams.



You should now have six assemblies like the following photo.



## **Blackening Metal Castings**

We've reached a point where we need to install some Nut-Bolt-Washer (NBW) castings, so this is a good spot to discuss blackening. Blackening has some advantages over paint, the first being that it holds up a little better. Additionally, when white metal is blackened, it takes on a nice rusty-brown look, giving instant weathering in one step as opposed to two (paint it grimy black, then overspray with rust). Cleanup is also easier, since all one needs to do is dispose of the blackening agent and rinse the bowl.

I use Blacken-It, a product meant for hobby use and available at hobby shops, through Walthers, or through Micro-Mark. I use a RubberMaid container that I begged from my wife for the Blacken-It, and the bottom of a 1-liter soda bottle for rinse water. A pair of tweezers, a disposable brush, and some paper towels complete the list.

The first thing to do is rinse the nut-bolt-washer castings in denatured alcohol or something similar to remove all traces of mold release that may remain from the casting process. Take a bag of Ozark OM-07B NBW castings and dump it into a container of alcohol and swish them around for a bit, then remove them and place on a paper towel to dry.



You'll note that the RubberMaid container is propped up at an angle. This saves Blacken-It, a consideration since, once used, you shouldn't pour it back in the container. It contains chemicals that, when used, get "used up" and mixing it with fresh fluid will contaminate the bottle. Instead, I have another empty bottle into which I pour the "used" fluid. I marked "Used" on the label in red marker. The solution is reusable up to the point that it gets too weak, so it's worth saving, since it costs money. When it gets too weak to be effective, I pour it into an old gallon jug which I dispose of properly when full. One other word of caution - this stuff is toxic, so read the label and observe all precautions, and use it in a well ventilated area.

Take the castings previously cleaned in alcohol and dump them into the Blacken-It container. Add enough Blacken-It to completely cover the castings and let it work for a minute or two. With fresh solution, you'll see the castings start to darken almost immediately. After thirty seconds or so, take the disposable brush and "poke" the castings with a scrubbing motion. Small air bubbles get trapped on the castings and will cause shiny spots - areas where the fluid wasn't in contact with the metal because of the air bubble.

The longer you leave the castings in the fluid, the "rustier" they will become. After a minute or two, pick up the container and tilt it in the opposite direction to uncover the castings. Swirl the castings around a little with the brush and take a good look at them. If you're satisfied with their appearance, you can remove them - otherwise give them another minute in the solution.

Set the container flat and with your tweezers, remove the castings one by one and dump them into your container of water. The solution needs to be rinsed off. Once all your castings are in the water container, remove them one by one and lay them on a paper towel folded in half to drain.



You're going to need 124 of these NBW castings for the tank alone (over six packs), and more when we build the supporting trestle work. At this point, we only need eight of them, so I'll leave it up to you whether you want to do a few now or the whole lot. You'll need to blacken some brass rod later anyway when we get to the tank's tie rods.

### **Installing the NBW Castings**

We need to install NBW castings on two of the tank support frame assemblies now, since they'll be difficult to do later due to the close spacing of the supports at tank center. Take a casting in your tweezers and place a small dab of gap-filling CA on the end of the pin.



Now carefully insert the casting into the hole in the support frame's corner - note the orientation of the frame in the photo. You want to place the NBW on the wide side of the horizontal support beam. Some of the glue will squeeze out onto the surrounding wood. To keep this from pooling on one side, spin the casting 180 degrees at this point, and press it the remaining distance into the hole. This rotation helps distribute the glue evenly under the washer. Apply pressure with your tweezers for about 30 seconds, or until the glue starts to harden.



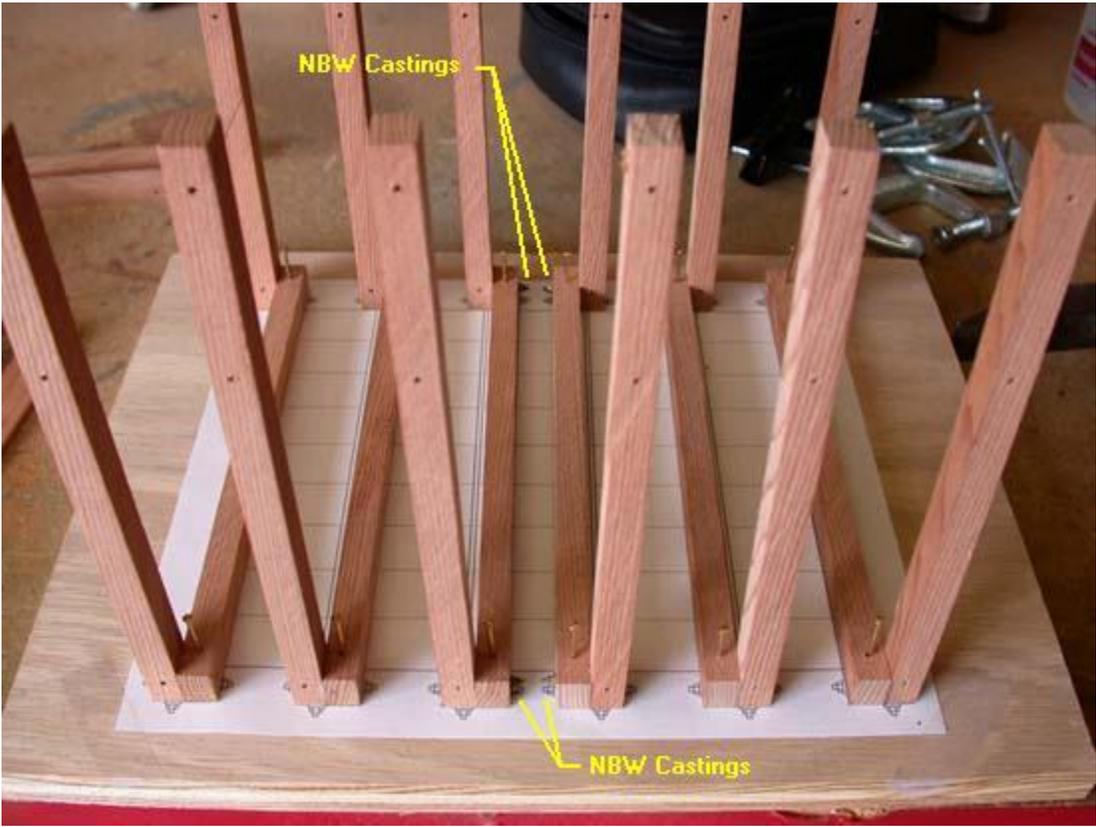
Glue a NBW into the opposite corner as well. Do this to two frame assemblies.

### **Assembling the Frames and Tank Top Wall**

Take your jig and turn it over. Make or print a copy of **Drawing Two - Water Tank Top View** and tape it to the board. Carefully align one of the frame assemblies without the NBW's with the drawing at one end and secure it to the board with small nails or brads. Use something here that fits loosely through the predrilled holes. Secure another frame assembly (without NBW's) to the other end. Place one of your 2 x 12's against the vertical supports on one side to align the remaining assemblies and secure them all to the board.



The two with NBW's go in the center, with the castings facing each other. Make sure the vertical supports on one side are tight against the edge of the 2 x 12, and that each assembly is lined up correctly with the drawing.



Lay two 2 x 12's atop the horizontal supports, and with the first board's edge against the vertical supports. Lightly draw a pencil line on the horizontal supports marking the inner edge of the second board.



This line will serve as a guide for where to place glue.



Apply glue sparingly inside your guide lines.



Use your finger to spread the glue around and remove any excess. Again wipe the edges of the horizontal supports diagonally with your finger to minimize glue being squeezed out. This will be the top of the tank, and so will be highly visible. Since the supports are necessarily nailed to the jig, you won't be able to see this excess glue until it's too late to remove it. The trick is to use enough glue to secure the boards (the surface definitely still needs to feel "wet"), while at the same time not to use enough to cause it to squeeze out all over the place once clamped.



Position your first 2 x 12 board with its edge against the vertical supports, and its ends flush or centered with the outer two vertical supports. Do this from above without letting the board touch the glue. Once positioned, press it into place. Position the second board against the first and again, once positioned, press it into place. You don't want to slide these boards around in the glue, or you'll get glue where it isn't wanted, and where it will be visible later.



Place a stout board atop your 2 x 12's and clamp them in place. Allow to dry for the required amount of time.



Lay the third, fourth, and fifth boards in place just as you did the first two, draw a pencil line, apply glue, position and press the boards into place, clamp and allow to dry. Repeat with the sixth, seventh, and eighth boards.



Hold the last board against the uprights and mark it's needed width on both sides. I use a scalpel for this. Lay a straight edge to your marks and trim the board's width as required for a tight fit. Once trimmed, glue it in place, clamp it, and allow to dry.



Remove the nails securing the tank assembly to the jig board, remove the tank assembly and flip it over. Check for any glue where it doesn't belong. If some managed to get in the wrong places, you can remove it with either a scalpel (for blobs in the corners), or try sanding it off. A fingernail emery board works for this.



### **Assembling the Tank Side Walls**

You now have a choice on how to make the tank side walls. Because I have the small MicroLux table saw, I decided to dado my side walls to allow the front and rear walls to fit into the slot. This requires pre-assembly of the walls, which I'll describe next. If you don't have the equipment to dado the walls, or elect not to, it still pays to pre-assemble the walls because the pieces used to hold them together will add structural reinforcement. You can also create the walls just as you did the tank's top - i.e. by gluing the boards to the vertical supports two or three at a time, clamping them, and allowing them to dry. If you choose to go this last route, skip down to the section on **Mounting the Side Walls**. Either way, the vertical supports need to be aligned with the drawing and nailed to a jig board just as we did with the top.

To pre-assemble the side walls, we'll need to make another jig. As before, start with a 7" or longer strip of straight scrap pre-drilled and nailed to a base board roughly parallel with the long edge. Affix another piece of pre-drilled scrap at least 4-3/4" long along one side, and square to the first piece.



Lay eight of your 2 x 12 side boards into the jig, and affix a third piece of scrap parallel to the third. Make sure the side boards are held tightly together by the third piece when nailing it into place. Remove the side boards and check this last piece to be sure it's square with the second piece, and parallel with the first.



Place your eight side boards back into the new jig, making sure that one end is tight against the side piece of the jig.



Take two pieces of scrap (size doesn't matter), and glue them to the side boards. They need to be at least one inch back from each end of the side boards to allow clearance for the front and back walls, and leave 0.10" minimum of the side boards exposed to allow clearance for the top and bottom. You can use glue liberally here, then clamp and allow to dry.



The photo below shows one finished side wall after putting in the dados, which start 0.40" from each end, are 0.10" wide, and are about half the material width deep, or 0.05".



## Mounting the Side Walls

Whether or not you chose to pre-assemble and/or dado the side walls, or to build them up as we did with the top, you'll need to fasten each of the tank frame vertical supports to a jig in order to keep them properly aligned. This is done just as we earlier did the top. Tape a side view drawing to the jig base, align each piece, and hold it in place with small nails or brads driven into the base board through the pre-drilled holes.



If you pre-assembled the walls, put it in place and draw a light pencil line on each vertical support along the bottom edge of the wall to act as a guide for where glue is needed. Put glue sparingly on each support, position the wall without touching the glue, and press it into place once positioned. The end of the walls should be flush with the outer edges of the outer two vertical supports, and the top edge butted tightly against the top boards previously installed. Clamp the wall and allow to dry. I placed a piece of the same scrap used to hold the wall boards together down the middle temporarily to put clamping pressure in the center of the wall. Once the glue dries, repeat with the other wall.



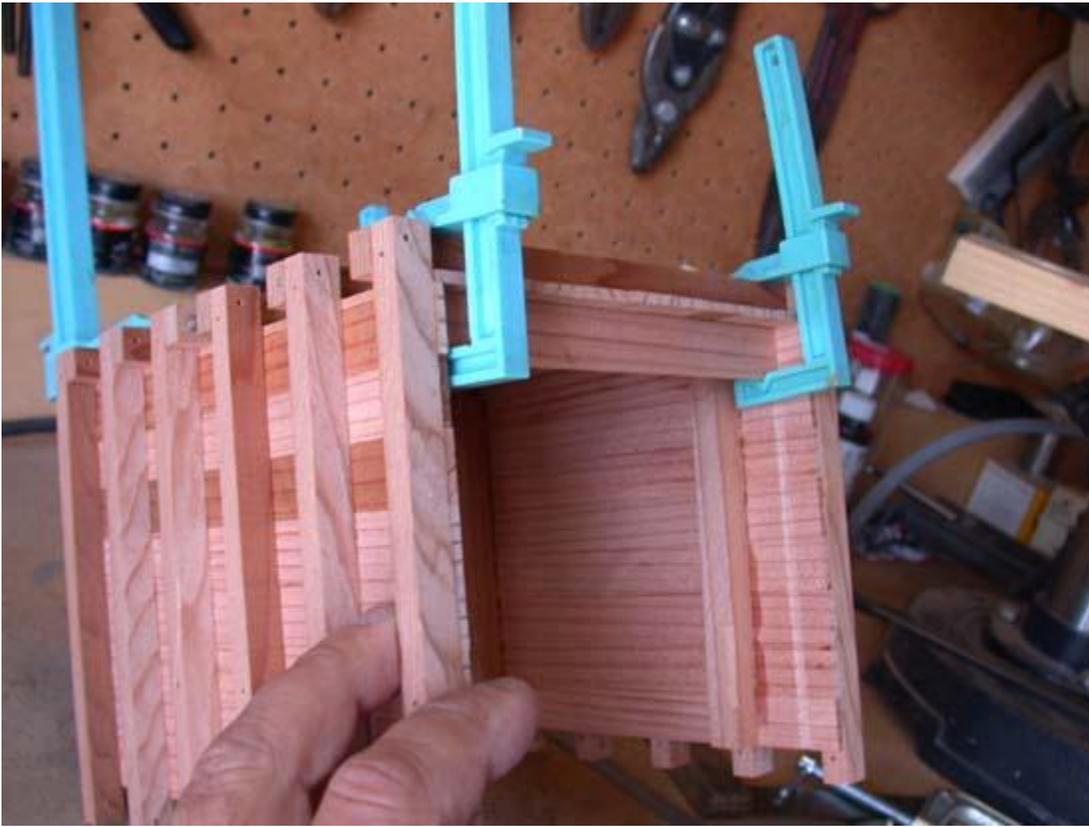
If you're building the walls up without pre-assembly, do exactly as you did for the top, building up each wall two or three boards at a time.

### **Making the Front and Rear Tank Walls**

The length of the 2 x 12 pieces making up the front wall needs to be determined now. You'll need to do this by trial and error to obtain a good, snug fit with the side walls. There's no magic formula for this. Cut a piece a little long, then trim it to either...

- fit snug inside the side wall dados
- butt squarely and snugly against the side wall boards

Once you establish the length of the top piece, cut seven more to exactly the same length (having them exactly the same length is even more critical if you chose not to dado the side walls, since any gap will be visible). Once all eight pieces are cut, glue the top board in place. Put a thin line of glue on the top of the board where it butts against the tank's top, on on each end. Use your finger to spread it thin to prevent "squeeze-out" and install it. Clamp it and allow to dry.



Glue the remaining boards in place. I should mention here that I also put a dado (or is it called a rabbit here), in the bottom board, 0.10" wide and 0.05" deep along the bottom edge to accept the ends of the tank's bottom boards). Again, clamp things and allow to dry. Repeat this whole process to make up the rear wall.



You should now have something that looks like the photo above. If you've worked carefully and kept everything square with everything else, you should be able to lay one of the bottom supports against the bottom of the vertical supports and the ends should align perfectly, as in the photo below.



Take some pieces of scrap and cut them 0.10" minimum shorter than the length of each inside corner, where side walls meet front and back. Liberally apply glue and press into place to reinforce the wall joints.

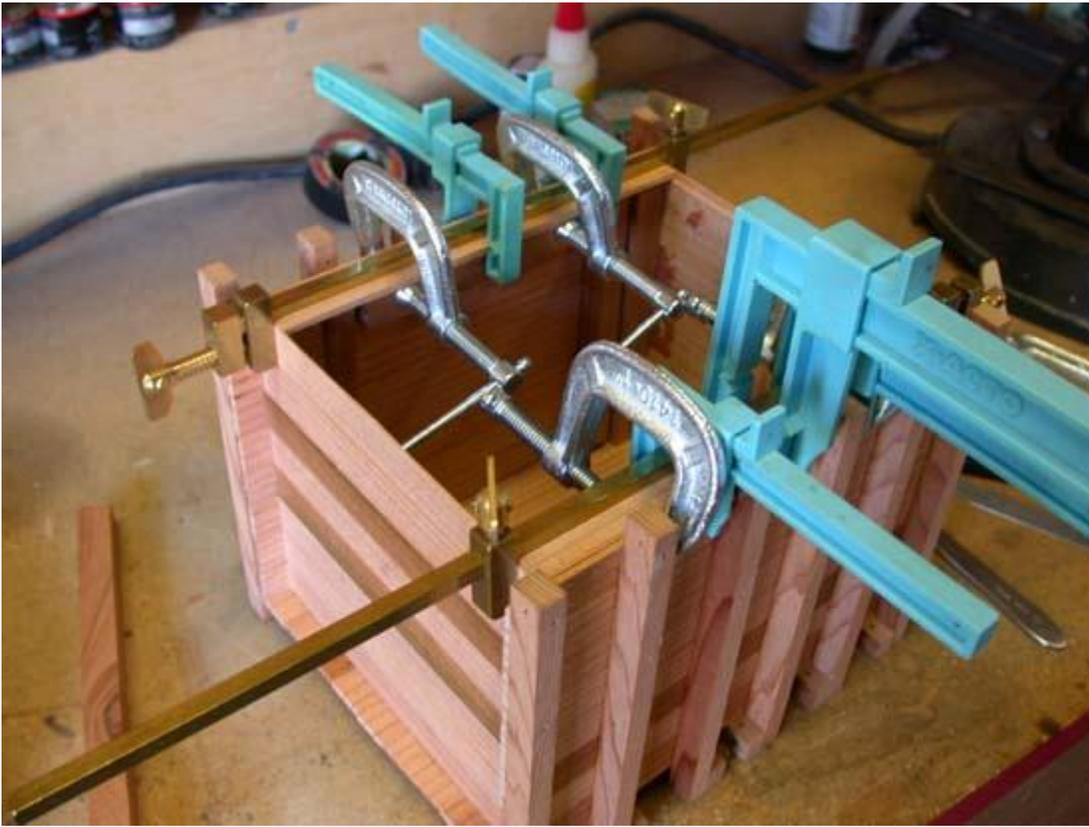


If you didn't dado the side walls, you'll need to use care here so as not to break loose the thin joints where the front and back walls meet the sides.



### **Making the Bottom Tank Wall**

Determine the length of the bottom boards just as with the front and back - through trial and error. They require a snug inside-fit within the sides and ends. If you put dados the bottom of the ends, this should support the bottom boards where they meet the front and back. If you didn't, you might want to glue a piece of scrap in place 0.10" from the bottom edge to support the bottom boards (if I'd thought of it in time, I'd have probably also put dados the bottom side boards as well). In either event, glue the two outer bottom boards in place.



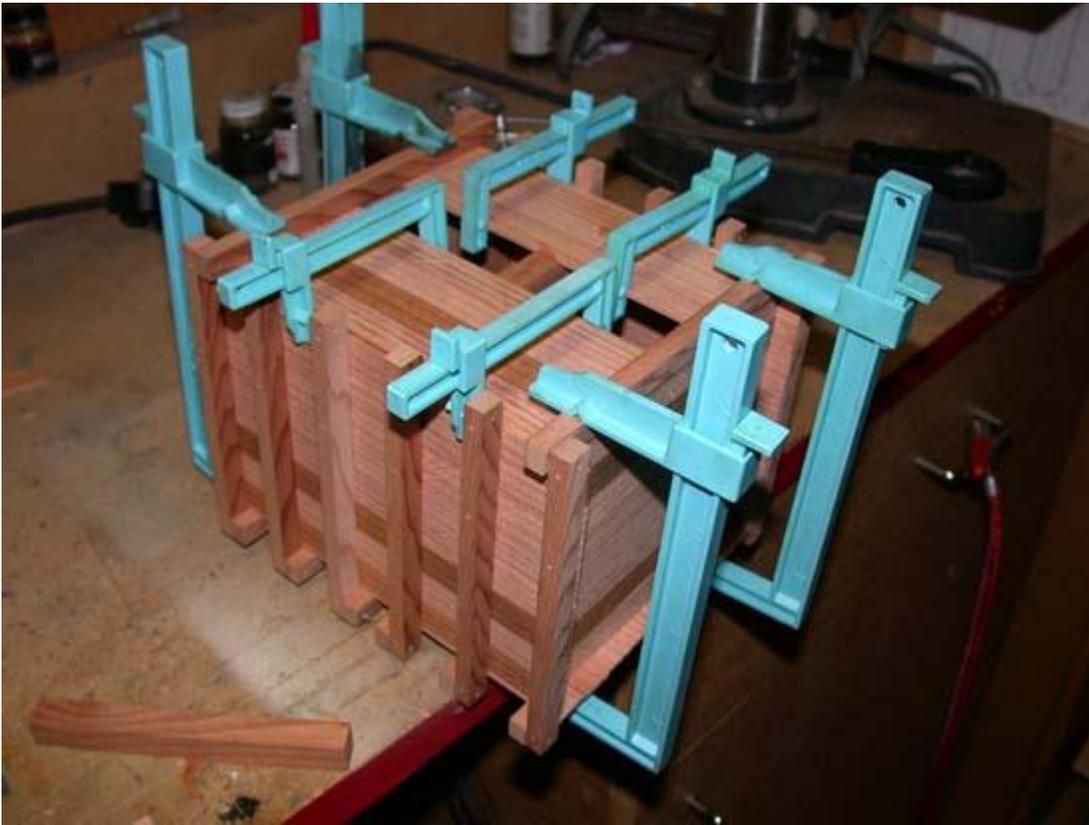
Cut some more reinforcing scrap and glue in place where the bottom boards meet the sides.



Cut one more piece of scrap and glue it in between the two reinforcement strips just applied to support the bottom of the tank.



The bottom of the tank, like the top, is made up of nine boards. However, where the top was an outside-fit like a lid, the bottom is an inside-fit. This means one board will be narrower than the others, so we'll place it in the center. Glue three more bottom boards in place on each side, leaving a gap for the ninth board in the middle.

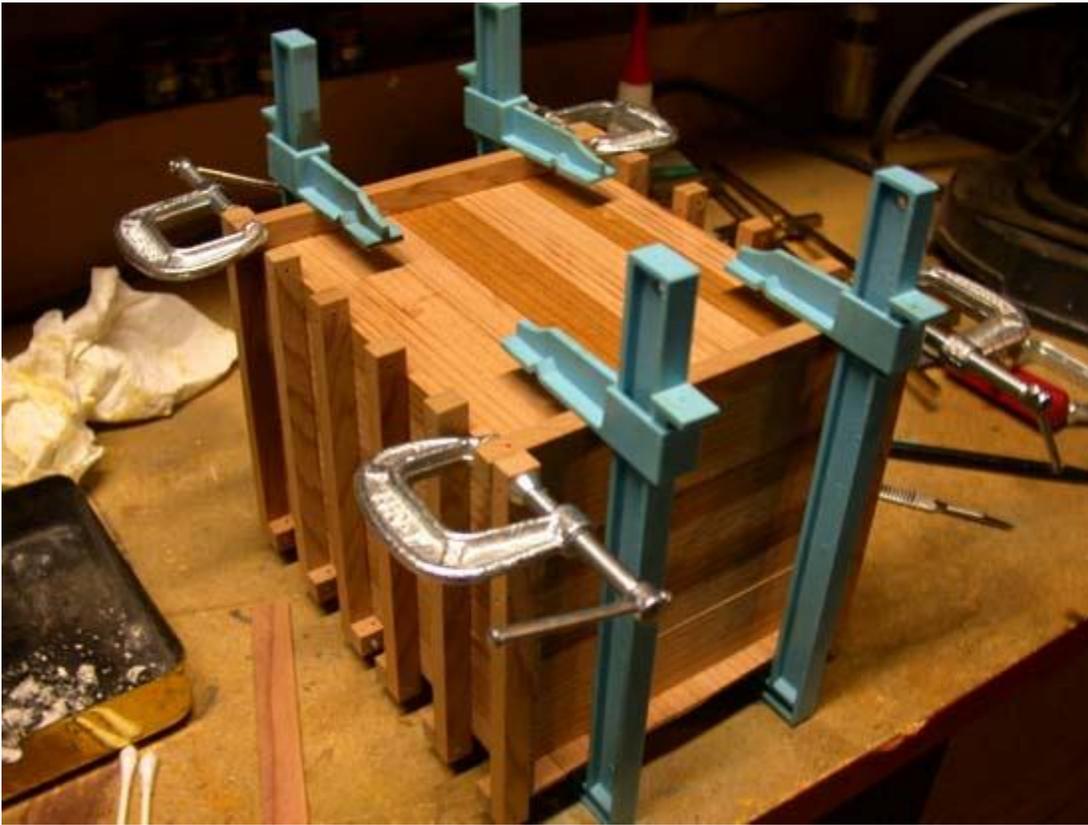


Trim the width of the last board to fit snugly into the gap and glue it into place.

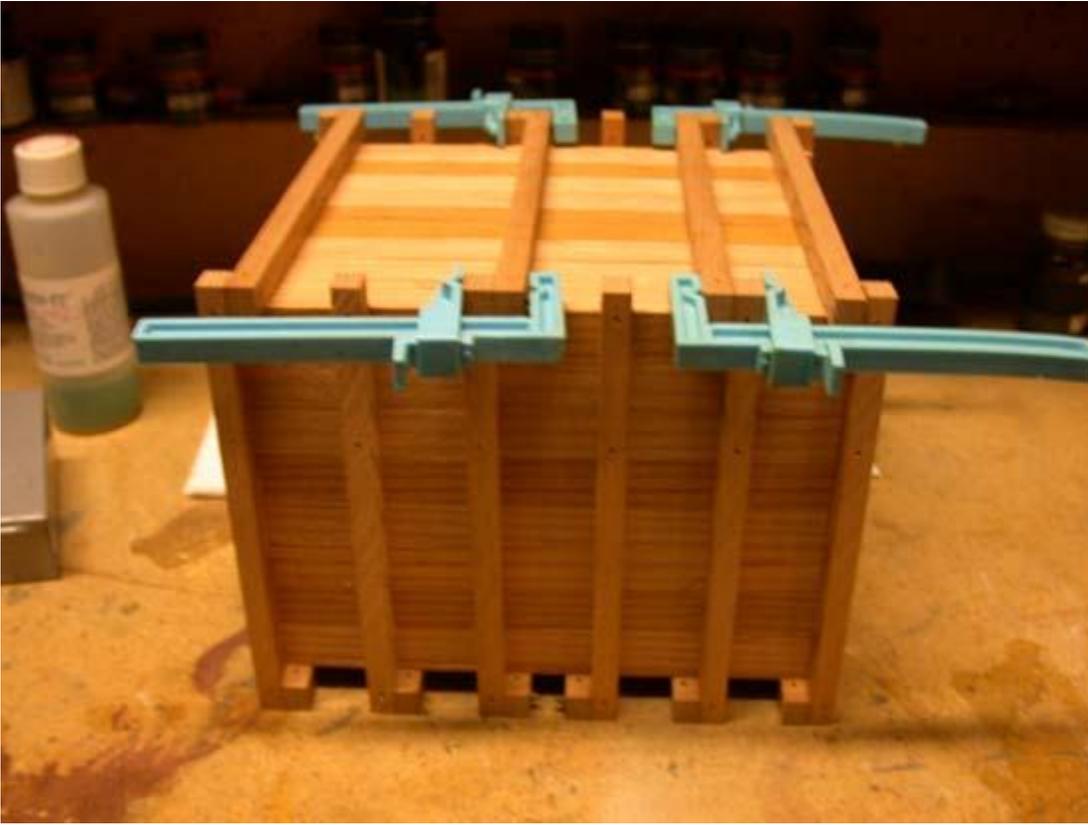


**Installing the Bottom Supports**

Glue the outer two bottom horizontal supports into place. These should be glued to both the bottom boards and to the vertical supports.



Install the remaining four bottom supports. I did mine in alternate pairs to leave room for the clamps.



### **Making the Front and Rear Supports**

Take a piece of your 6 x 8 (0.30 x 0.40) material and, with the narrow side facing outward, determine the needed length to snugly fit between the tank's top boards and the bottom horizontal support on the tank's front side. Cut three boards this length.



One by one, hold the front supports, again narrow side up, against the side wall and, using a #53 (0.0595) drill in a pin vise and inserted through the middle hole in the vertical support, drill through the front support (you can mark the locations in this manner and do the actual drilling on the drill press). You'll be drilling through the wide side, by the way.



On the narrow side, lay out and drill a hole on each end that's 0.15" from the side edge and 0.30" from the end. Lay out and drill a third hole on towards the bottom that's also 0.15" from the side, but 1.50" from the bottom end, or 1.20" from the other hole (see photo below). Make sure this last hole is on the same end as the hole in the wide side previously drilled.



Repeat these steps to make the rear supports.

### **Installing the Front and Rear Supports**

On the top and bottom edges of the front wall, find the exact center, then measure over 0.15" left of center and put a small mark. These marks establish the left edge of the center support. On each side, measure over 0.70" from the side wall and place marks. These establish the outer edges of the outer supports. Do the same on the rear wall. Once the support edges are established, glue the supports to the front and back wall.



Clamp and allow to dry. I used my jig boards for pressure blocks between a couple of bar clamps.



## Installing the Tie Rods and NBW Castings

We're coming into the home stretch so far as the tank proper is concerned. If you didn't blacken the remaining NBW's needed for the tank before, now's the time.

Starting with the top-left corner of the supporting framework, glue six NBW's into place.



Take a piece of 0.052" brass rod, and cut six pieces so that they will fit about 1/8" into the holes in the vertical supports on each side. Blacken these brass rods. I do them one at a time to ensure that the solution is in contact with all areas of the rod. Also, it pays to use fresh solution here. Rinse them and drain as before.

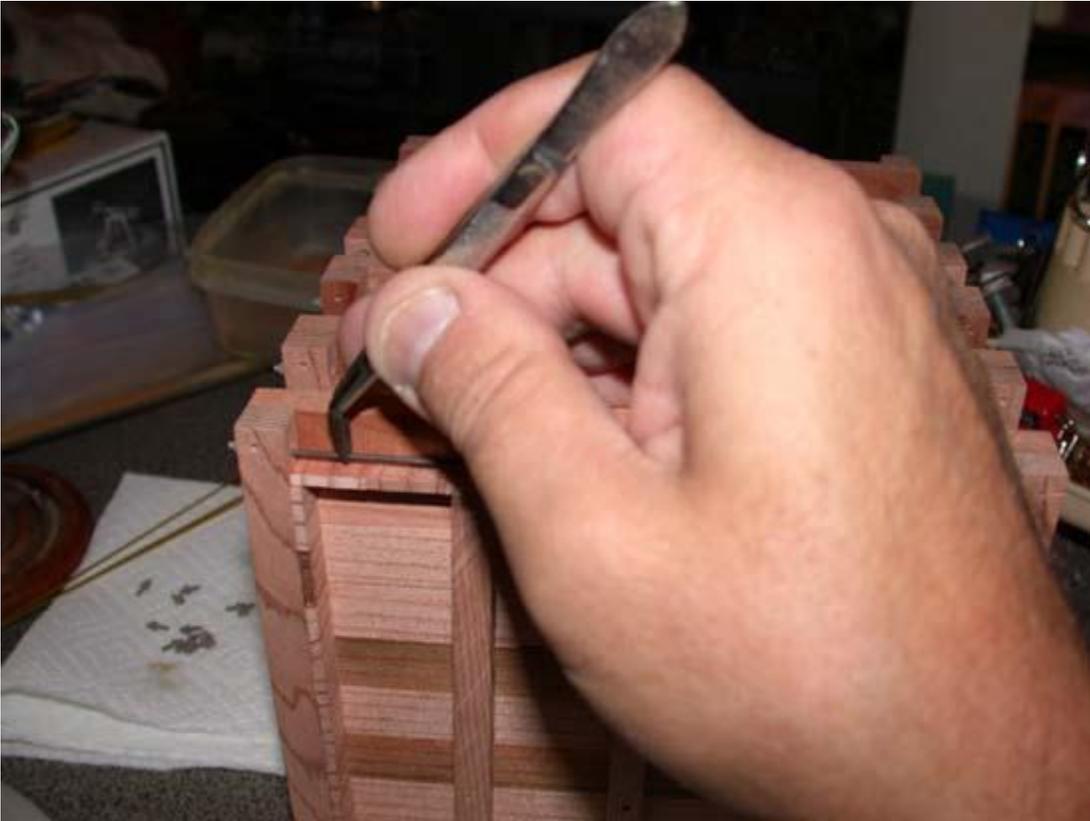


If you want to apply a light overspray of rust, do so now.

Slide the tie rod into the open hole of a vertical support, opposite the NBW previously installed.



Grab the rod with tweezers, pull it through, and insert the other end in the remaining inner hole. Install the remaining five top tie rods.



Flip the tank on its side, NBW's down, and glue six more NBW's into the vertical supports, essentially trapping the tie rods.



You may notice areas where the blackening has rubbed off the brass rod, leaving a shiny spot. If this happens, touch it up with either some Blacken-It applied with a brush, or with black or rust pant. Be careful to keep Blacken-It off the wood itself, as it will stain it badly.



Make and install the tie rods and NBW's for the bottom, sides, front, and rear. Lastly, install the remaining NBW's in the corners, sides, front, and rear.

You have now completed the water tank itself. Sit back and admire your handy work. If you've gotten this far, you deserve it!!



In **Part IV**, we'll construct the supporting trestle work, and the water pipe. Then we'll mount the tank on the trestle frame. In **Part V**, we'll construct the frost box and the spout hanger, and we'll mount the water spout. In **Part VI**, we'll finish the project by making the water gauge and the ladder, and constructing a hatch on top of the tank.