DuckSkiff

Duckskiff is a 14 foot skiff I designed for a buddy of mine named Tim that I work with. Tim is an avid Duck hunter and wanted a fairly lightweight boat but in nice quiet wood rather than noisy aluminum. He also wanted something a little boatier than a Johnboat styled craft. What I came up with for him is a 14 ft long 5 ft wide at the shear (45 inches wide at the bottom) kind of semi-dory hull. I did this to make it an easier and dryer proposition when pulling a large dog over the side and back into the boat. The additional ultimate stability of the 23° flare to the sides allows a lot of weight to be right at the sides of the boat while at the same time getting the shear lower to the water. He wanted to be able to use his 7 hp motor to get around now with the probability of upgrading to a higher hp later on. As the hull was originally derived from a rowing style hull I was playing with a few months previously I tweaked both of them so that they were brother and sister similar and decided to present them to you here. Enjoy…

Specifications for motorized version:

LOA: 14’ 3”

Beam: 5’ 2” (with trim)

Depth at midships: 18”

Draft at design weight of 860 lbs is 4.5”

Approximate boat weight: 180-220 lbs

Motor to 25hp

Specifications for rowing version:

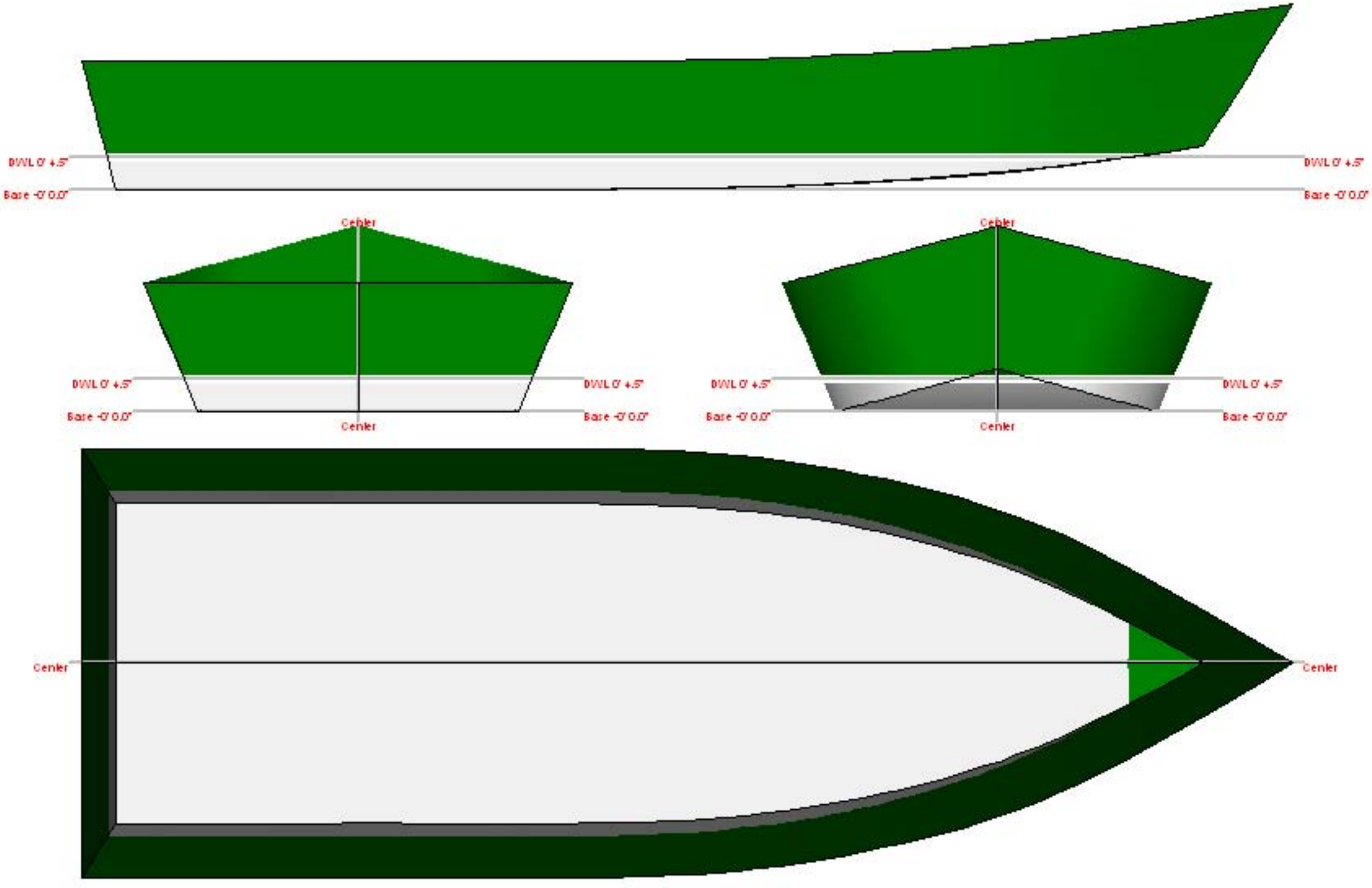
LOA: 14’ 1”

Beam: 5’ 2”

Depth at midships: 18”

Draft at design weight of 600 lbs is 4”

Approximate boat weight: 130-160 lbs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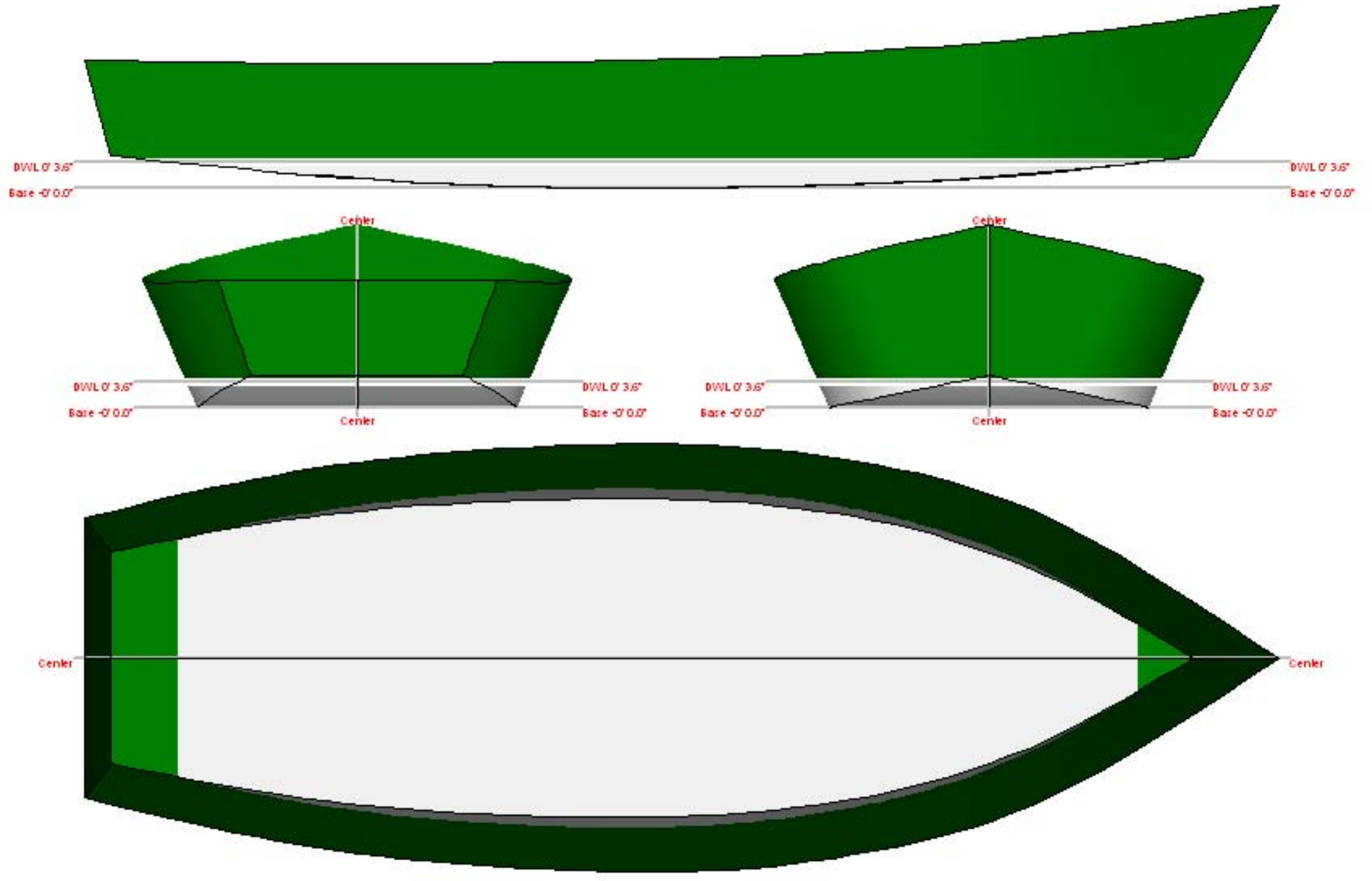
DWL 0' 3.6"
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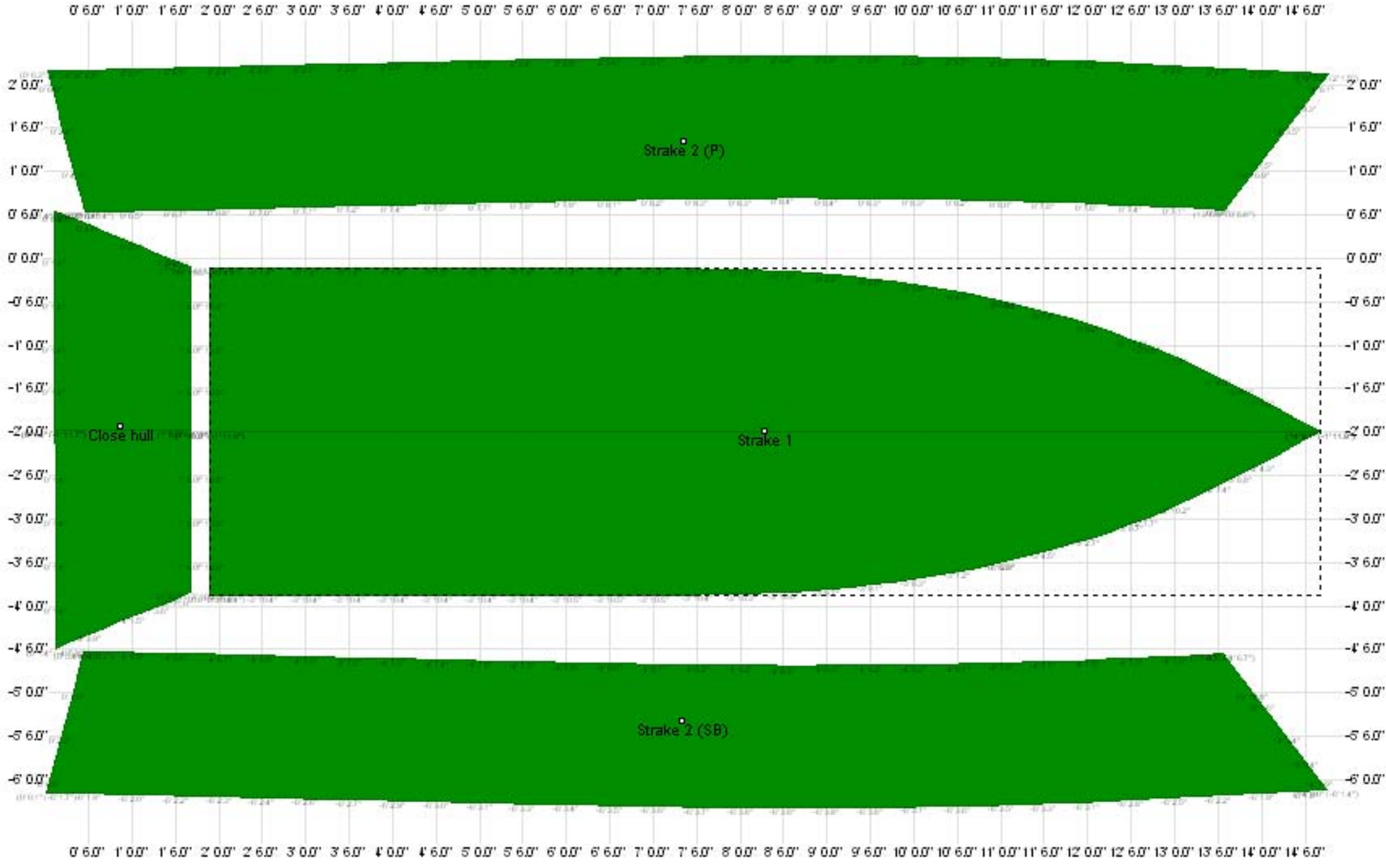
Drawing showing the shapes of the completed panels, use the offsets not the shown grid.



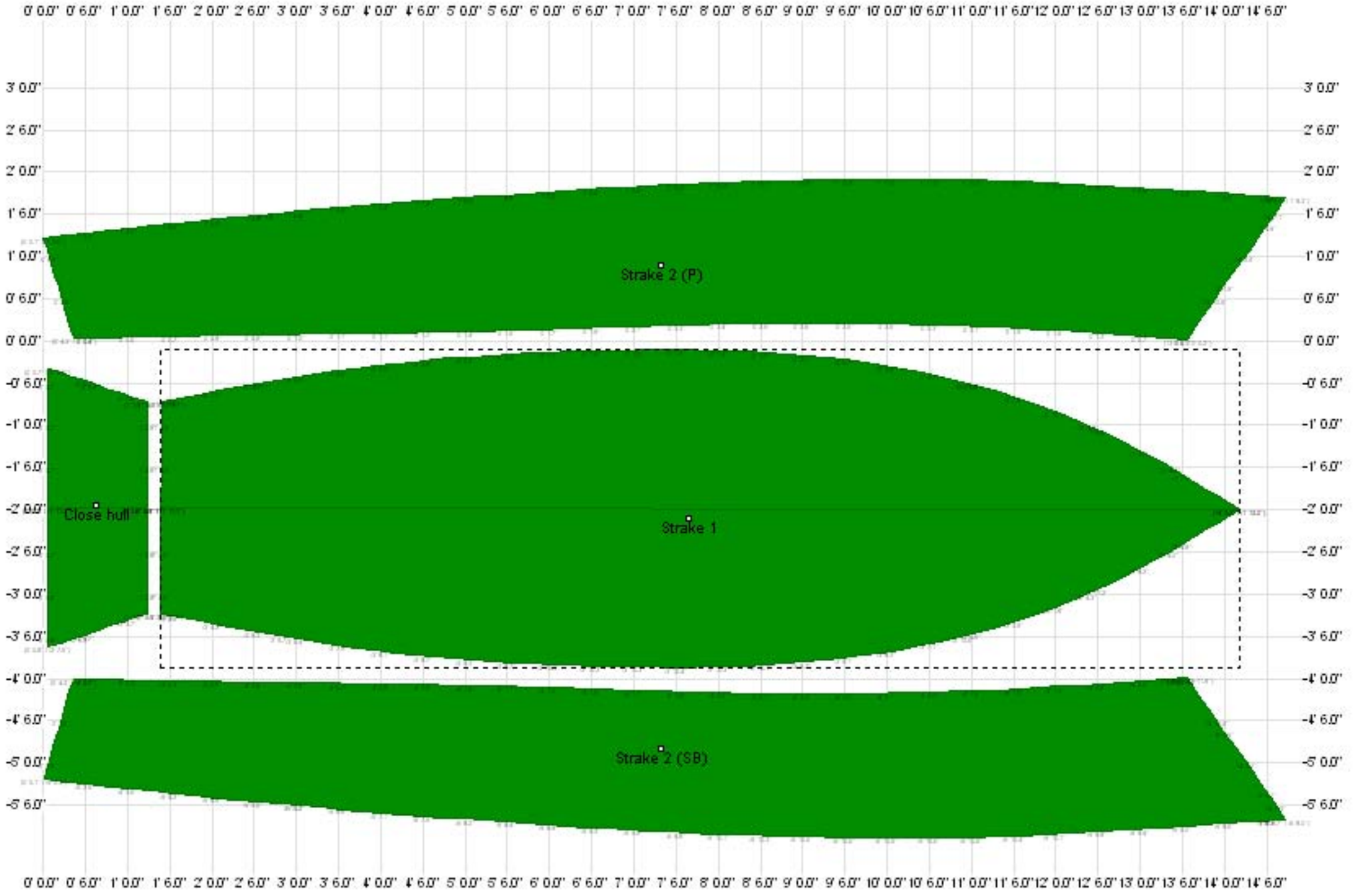
Bottom Panel Half				
Station	X	Y	X2	Y2
1	0	0	0	22 8/16
2	61 3/16	0	61 3/16	22 8/16
3	76 8/16	0	76 8/16	22 4/16
4	91 13/16	0	91 13/16	21 1/16
5	107 2/16	0	107 2/16	18 8/16
6	122 7/16	0	122 7/16	14 5/16
7	137 14/16	0	137 14/16	8 4/16
8	145 9/16	0	145 9/16	4 6/16
9	153 5/16	0	153 5/16	0

Side Panel First Chine				
Station	X	Y	X2	Y2
1	5 4/16	0	0	19 7/16
2	12 14/16	3/16	12 8/16	19 11/16
3	28 3/16	8/16	27 12/16	20
4	43 8/16	13/16	43 1/16	20 6/16
5	58 12/16	1 2/16	58 6/16	20 11/16
6	66 7/16	1 4/16	66	20 13/16
7	74 1/16	1 7/16	73 11/16	21
8	89 6/16	1 10/16	89	21 3/16
9	104 13/16	1 11/16	104 6/16	21 4/16
10	120 8/16	1 9/16	120 1/16	21 2/16
11	136 11/16	1 2/16	136 4/16	20 11/16
12	153 11/16	7/16	153 4/16	20
13	162 9/16	0	176 14/16	18 12/16

Transom Half		
Station	X	Y
1	0	22 8/16
2	18 10/16	30 2/16
3		
4		

Max Beam Station Half		
Station	X	Y
1	0	22 8/16
2	18 10/16	30 2/16
3		
4		

Drawing showing the shapes of the completed panels, use the offsets not the shown grid.



Bottom Panel Half				
Station	X	Y	X2	Y2
1	0	0	0	15
2	7 4/16	0	7 4/16	16 10/16
3	23 1/16	0	23 1/16	19 3/16
4	38 6/16	0	38 6/16	21 1/16
5	53 12/16	0	53 12/16	22 2/16
6	69	0	69	22 8/16
7	70 15/16	0	70 15/16	22 8/16
8	84 5/16	0	84 5/16	22 4/16
9	99 10/16	0	99 10/16	20 14/16
10	114 15/16	0	114 15/16	17 13/16
11	130 4/16	0	130 4/16	12 9/16
12	145 11/16	0	145 11/16	4 14/16
13	153 6/16	0	153 6/16	0

Side Panel First Chine				
Station	X	Y	X2	Y2
1	4 4/16	0	0	14 4/16
2	12 2/16	3/16	11 9/16	15 9/16
3	27 11/16	8/16	27 2/16	17 2/16
4	43 3/16	11/16	42 8/16	18 9/16
5	58 8/16	9 6/16	57 13/16	19 13/16
6	73 13/16	1 6/16	73 2/16	20 14/16
7	75 12/16	1 7/16	75	21
8	89 2/16	1 14/16	88 6/16	21 12/16
9	104 8/16	2 3/16	103 12/16	22 6/16
10	120 2/16	2 2/16	119 6/16	22 10/16
11	136 5/16	1 10/16	135 9/16	22 7/16
12	153 8/16	11/16	152 12/16	21 12/16
13	162 10/16	0	176 10/16	20 2/16

Transom Half		
Station	X	Y
1	0	15
2	14 1/16	19 13/16

Maximum Beam Station Half		
Station	X	Y
1	0	22 8/16
2	18	30 2/16

Keel Line Offsets for Skeg		
Station	X	Y
1	0	4 8/16
2	7 10/16	3 12/16
3	22 15/16	2 5/16
4	38 4/16	1 2/16
5	53 9/16	5/16
6	68 14/16	0

DuckSkiff14 and DuckSkiff14R

Building Instructions

(Note: Read the whole thing at least once all the way through prior to starting)

Introduction:

Using these instructions, along with the accompanying sketches, drawings, illustrations, photos and tables, you should be able to build either version of DuckSkiff14with relative ease over the course of 2-6 weekends. The original instructions were written for just the motorized version but have been added to, amended to and revised in the appropriate areas where the information or building instructions differ for the rowing version. Please take the time to read ALL of the information as better than 90% applies to both forms of the boat and in both methods of construction. The photos are not of this particular boat but are used to illustrate what a certain method or outcome should look like. Do not be thrown off by a Vee bottom or a differently shaped hull but use it as a visualization of one possible way of doing something. The Photos are also not all mine but are courtesy of my many online friends in the various forums and groups that I inhabit

Bill of Materials and Construction Sequence

Bill of Materials:

1: Two sheets of 3/8” (Row) or 1/2”(Motor) plywood or MDO (Medium Density Overlay) for the bottom (Note: the longest life can be expected from marine grade plywood and MDO…lesser grades can be expected to have a shorter life span)

2: Two sheets of 1/4” (Row) or 3/8" (Row or Motor) plywood or MDO for the sides

3: One sheet of 1/4" plywood for seat boxes (if building them)

4: One sheet of 3/4” plywood or MDO for transom and doubler and also knees and breasthook if not using solid wood (required only on the motorized version). You can use 3/8” ply for the transom on the rowing version provided you add some framing t o stiffen it up a bit. The knees and breasthook can be of 1x stock.

5: 12’ and 16’ lengths of 1x stock. The amount will depend on the intended building method and finishing. At a minimum you will need 2”- 3” wide strips for the inner and outer wales, floor stringers, bottom rub strips and cleats… plus additional 1 1/4” wide strips for Chine Logs if building that way. You may also wish to use 1x stock for seat planks. If you choose to space the gunnel you will need to factor that in too. Sit down and calculate what you need by how you are planning on building the boat. You should only need the 16’ stock for the gunnels, but you can

get away with shorter stuff if you don't mind joints. All joints should be in the aft sections of the boat. The better the quality of the wood the easier to finish and the longer lasting.

6: Stem piece: 28" long piece of 2"x3" or 2"x4" fir or hardwood

7: A bag of 100 4" plastic wire ties or a roll of copper wire for the Stitch and Glue version

8: Epoxy…the minimum amount of epoxy needed is about 1 quart, for taping, gluing and filling on a boat built with Chine Logs. Stitch and glue will require another quart, as will glassing the bottom. If you wish to totally seal the boat (not a bad idea at all)…you will probably need all of the above and an additional quart…so about 1 gallon of epoxy. I don't recommend polyester resin as it is not useful as a glue, isn't really waterproof in the amounts you would use and doesn't stick to wood nearly as well as epoxy does. To save some on epoxy you can use a glue like PL Premium polyurethane glue when gluing parts together, but it tends to foam up so it doesn't work so well as a sealer.

7: Filler for the epoxy…I like wood flour mixed with Cabosil (fumed silica…wear a dust mask) 2 lbs of wood flour and ½ lb of Cabosil will do the trick for Stitch and Glue, half that for Chine Log.

8: Fiberglass: Tape =10 yards for Chine Log, 25 yards for Stitch and Glue Cloth= 50" width x 5 yards 4-6 oz cloth if you plan on glassing it the bottom.

9: Mixers, mixing containers, tongue depressors or shaped applicators (for fillets) latex or plastic gloves, dust masks, sandpaper, 3/4" Stainless screws (if leaving them in) or drywall screws (if removing) Clamps (cheap plastic ones are fine, or cut some 4"-6"schedule 40 PVC pipe into 1" slices and split one edge for a really cheap clamp), primer and paint. Deck and porch paint or any good exterior heavy duty paint is fine along with a good primer, Painters plastic or plastic sheet for covering windows (better).

10: Tools: The absolute minimum I would want to get by with is a circular saw and a power drill/driver for power tools although if you are good, a jigsaw will do the job. Hand tools include a tape measure, a square, a small block plane, a small hand saw for trim work and a screwdriver. An Orbital sander is a definite nice thing to have when it comes to rounding the Chines over and feathering the tape edges in. A table saw makes cutting bevels on long pieces a snap too, so you might want to borrow or rent one for a couple of hours and get all your parts cut out ahead of time. If you don't want to use screws to hold things together…you will need a bunch of clamps. Cheap spring clamps work most of the time but you could probably use a few C (or G) clamps for any tough stuff. You can also make cheap clamps out of 6" Schedule 40 PVC pipe…just cut 1"-2" slices of the pipe and then cut a slit in them so you can open them up.

11: Batten: Personally I use a 1" x 1/8" x 8' strip of aluminum as a batten and I recommend you do too, especially if you are building the Chine log version. You can use a wider batten on the Stitch and Glue version but you only have 1/2" space for your batten and nails on each side when laying out the bottom panel with the Chine log version.

Step One Laying out the panels:

Option One: Stitch and Glue Construction for both versions:

We'll start with the bottom panel. You will need one full sheet (96") and one piece cut to a length of 59 1/2" of your chosen thickness Ply.

Butt the two pieces of ply together lengthwise with the shorter piece on your left and the factory edges together. Run a line down the center of the panels for the full length. This is the Center line of the boat. Measure out 22 ½" on either side of the Center line and draw parallel lines…these are the outside edges of the finished panel. The left edge of the plywood is the transom end. Mark these lines on the other side of the sheets. Measure along the centerline a distance of 61 3/16" (71" for the rowing version) and mark this point. Mark points along the outside edges at the same distance and connect the dots with a line. This is your Max Beam Station (orange highlight in the offsets table). (For the rowing version…skip to the next paragraph). From there forward the sides curve in and will use the X2 and Y2 offsets to plot the curves of the bow on both sides of the centerline. The X2 dimension is measured from the left edge of the plywood and the Y2 dimension will be the distance from the centerline to the upper and lower points. Measure the distance "X2" along the centerline and put the square there. Measure up Y and mark a point at the correct distance from the centerline for that coordinate. Do the same thing on the other side of the centerline. The last point at the bow should be on the centerline and almost to the right edge of the plywood. Hammer in nails placed outside each point and offset by the thickness of the batten. Bend the batten against the inside of the nails and clamp to each nail, then run a pencil line through the points along the batten. Take selected measurements between the points on each side and adjust the lines so that they are equal all the way to the bow. Cut out the bottom panel and set it aside.

For the rowing version, Start at the transom end on the centerline and plot the X2 and Y2 coordinates, mirroring the points from the upper edge line on the bottom edge line. For example… for the coordinates X2=14", Y2 =18" you would measure 14" along the centerline then measure up 18" perpendicular (use a square) and mark your point. Then you would measure 18" down from the centerline and do the same for the other half of the bottom panel. Once you have all your points plotted, connect them as described above.

To do the side panels, stack two sheets of plywood (good face in) and cut two 22" wide full length strips from the stacked sheets. Measure in from the outside edges for each strip, leaving the center as scrap. Keeping the paired faces together butt the strips end to end with the factory edges on the bottom. From the **right** edge measure to the **left** 176 7/8" (176 5/8" for the rowing version) and draw a line perpendicular to the bottom factory edge or parallel to the left edge (hopefully it is both). This line is the Y baseline and is the transom end of the panel. Start laying out your offset points moving from the Y baseline to the right, using the bottom edge of the sheets as your X line. Join the end points with straight lines and spring a batten through the top line of points (X2, Y2) and the bottom line of points (X, Y), connecting the dots. Make sure to draw a line between the top and bottom points of the Maximum beam station on both panels and

both sides(Hint: drill a very small hole just outside each of the two points, then connect the holes on the other side). Cut each pair of panels at the same time, making exact mirrored copies for each side. As a final item. draw a line from the bottom corner of the transom end at an angle of 15° from the transom edge (or 90° from the waterline) forward and up to the shear. On the motorized version this will be perpendicular to the bottom edge but on the rowing version it will look slightly canted due to the upward and inward curvature of the bottom on the finished hull. You will use this line later as a starting point for some measurements.

Using 3/4" ply (3/8” for the rowing version), Layout and draw the transom remembering to subtract the thickness of the side panel from each side edge and the bottom panel from the bottom edge and cut it out. When cutting the bottom and top edges, put a 15° bevel on the edges (see sketch). For the Motorized version you will need to know what sized shaft your motor has. If it is a short shaft (15”) you will need to cut a piece out of the top of the transom to get it to the correct height. For a Long shaft you will need to add a center ‘bump’ of 3 1/4" to raise it to 21”.For the rowing version you can make the top of the transom with a nice curve above the shear and you don’t have to bevel it. For the motor version only: Cut out a second piece that is the same as the top of the transom down to about half the depth of the transom…this is the doubler and you will trim it to fit later. The Doubler should have the same bevel at the top as the transom (see sketch). When laying out the transom…the offsets are for half of the transom (just like the bottom) and the transom looks like it is sideways (see picture). For both make a mold out of 1x4s and plywood scraps for the max beam station (see sketch).

Option Two: Chine Log Construction.

The only difference in the layout of the panels is in the bottom panel. You must add an additional inch to **each side** of the bottom panel to accommodate the chine log. You do not have to add the inch to the transom edge. This applies to both versions of the boat.

Step Two: The Stem Piece:

The stem piece for both options and building techniques is nearly the same: The angle of the bow is 32° for the Motor version and 34° for the Rowing version so half of those will be 16° and 17° respectively. Cut your chosen stem stock with the correct angle on both forward sides, so that you have a triangle shaped piece that matches the bow point of the bottom piece. Put an arrow on the top so you can orient it easily. Put one of the sides of the triangle up against the bow part of a side piece and mark the angle that the bottom edge meets the front edge at. Leave some extending above the top of the panel. You may want to leave it long as a useful post to tie

a painter to or you can cut it down and cover it with the breasthook to hide it. Trim the bottom end to the correct angle and the stem piece is done for now.

Step Three: Assembly:

Joining the panels for either version or method of construction:

To begin assembly, you need to first join the pieces of the panels together. This can be done with Butt blocks or with fiberglass butts (If you want to scarf the panels together, you will have to scarf them beforehand then layout the panels and cut). To make a butt block, take a piece of plywood of the same thickness and 12 times as wide as the plywood is thick and long enough to leave just enough room for a fillet and tape (about 2") on each side of the bottom and on the bottom edge of the side panels (Stitch and Glue). For Chine Log building you can go to within 1/2" of the edge and bevel it. On the top of the side panels, leave enough room for your inside wale. To attach the butt block apply epoxy to the edge grain of the panel pieces to be joined until it doesn't soak in anymore, paint the surfaces to be mated with epoxy and join the panel pieces in the center of the butt block and either clamp or put in a few screws to keep everything together while the epoxy cures. (you may use other waterproof glues such as PL Premium for these also) Do this for each of your panels. Put a piece of plastic down under the joint to keep things clean and prevent gluing the panels down to something permanently. You may use the panels as is until you come to finish the outside. When you are taping the seams or chine log, you should tape the outside of the joint. This isn't strictly necessary, but it does prevent any possible cracking at these joints and is only a tiny bit of extra work and materials.

When using fiberglass butts, the tape can go the entire length of the joint. You will need some scrap to screw the panels to so that they can't move while the epoxy is curing. Take some plastic sheeting and place it over the scrap so the panels won't be glued to it. Soak the edges of the joint and the faces where the tape is going with epoxy, lay the tape onto the plastic and wet it out too. Lay the panels down with the joint centered on the tape and tight together and then screw the panels down to secure them. Make sure you screw outside of the area that was taped. Wet the up side of the joint and lay tape over it and wet it out. Place some plastic over this and then screw another piece of scrap down (outside of the taped area) to clamp everything and put something heavy right in the middle. Let this cure. For 3/8" ply, one layer of glass on each side is sufficient, but for 1/2" ply I would use 2 layers. If you are going to glass the whole bottom of the boat and are using 1/2" ply, a single layer of tape under the bottom glass is ok, with 2 layers on the inside. The first layer of tape should be an inch wider on each side than the second layer so you can feather them down. You can also combine the two methods such as buttblocking the bottom and glassing the side joints. Pictures of both methods are on my web site.

Assembling the hull (both versions) Stitch and glue method:

To begin the assembly of the hull, we first need to drill the holes for the stitches. As this hull doesn't have any drastic curvature we can space the stitches out. On the run aft of the max beam station the stitches can be 12" apart. In the front section 8-10 inches would be good. Start with the side panels by facing them together and lining up all the edges. Clamp them together so they don't wander and then start marking for your holes. Leave a 3" space from the transom edge before your 1st aft hole, and also a 3" space at the stem area. Mark your holes about ¼" – 5/16" in from the edge. Drill the holes using a 1/8" – 3/16" bit (Hint: use a backing plate to prevent splitting and ragged holes as the bit comes out).

Next we glue and screw the stem to the side pieces. Here you need to preplan a bit… you will need to decide if you want to have the stem protrude or if you want the breasthook to cover it. If you want it covered, you will need to trim it down to below the level of the shear. Supposing your Breasthook thickness is ¾" you will need to cut the stem so that it is 9/16" below the top edge of the sides. This will take care of the thickness of the Breasthook plus 1/16" fitting room MINUS the 1/4" for the outer rail cap over the plywood edge (explained later). Cut the stem so that it is parallel to the shear so the breasthook will sit flush and even with the shear. When mounting the stem be sure to drill the holes for the screws to prevent splitting the stem. Space your screws every 2" or so. Now it is time to go 3D. There are two ways to do this…starting from the front or from the back. The traditional method starts at the transom working forward around the mold then pulling the sides together to attach the stem. My preferred method starts with putting the front together then using the length of the panel as leverage to bend the ply. (it also allows you to have the stem glue fully cured and strong when you bend) You will need quite a bit of room for this method though as the side panels will angle out in a wide vee at first. Put the bottom panel in the middle of the vee, put glue on the bottom of the stem and on the spot where the bottom will contact the stem and put a couple of screws through the bottom panel into the stem, making sure it is well lined up. Go to the other end and drill a hole in the bottom 3" forward of the transom edge on each side. Bend the sides around and put a 4" wire tie through the last hole on each side making sure the corners are together at the transom edge. Slide the transom in and tack it into place with a few finishing nails. Put the center mold in place (with the forward edge on the line) forcing the sides outward and tack it in with more finishing nails. Drill holes in the bottom corresponding to the holes in each side and wire tie from bow to stern, pulling the panels into place…but leave a bit of slack in each of the ties until the whole thing is stitched up. Snug the ties up, alternating sides to keep everything even but leave a couple loose at the transom end. Pull out the transom, soak the edges with epoxy until they stay wet, then thicken some up and put a bit along the edges of the side panels and transom and put the transom back in. Nail or screw it in to apply a bit of pressure then tighten the rest of the stitches. Go have a beer…you done good! (But don't take off for too long, you will want to square up the boat before the epoxy glue on the transom cures).

When you get back to the boat, take a good look at it…admire it…pat yourself on the back then get back to work. Next is squaring up the boat, beginning with leveling the bottom. After that you need to shape the bow area at the shear as it is probably narrower up front than the design calls for and the bottom is missing some rocker. How you will fix this is to put in a couple of spreaders made from 1x2 strips to push the sides out to the shape we want. The spreaders should be nailed in with a small finishing nail through the hull just to keep them in place and should be below the level of the inside wale so that they can be installed with the spreaders still in place. Taper the ends all the way around so it fits well against the inside curve of the side (see sketch). You will remove these once the inside wale is on. The distances forward of the transom bottom (that line you drew at the transom end of the side panels earlier) and how wide the outside edge of the ply should be at these points are in the offset tables. The best way to get these points marked is to measure the length from the bottom/transom joint and subtract 1 1/4" for the motorized version or 5/8" for the rowing version (Stitch and Glue) or the thickness of your cleat plus the thickness of the transom (Chine Log). Plant the corner of your square at the correct length and right in the corner of the side and bottom. Put a level against the upward arm of the square. Please don't get too hung up on the lengthwise location of these points as it is not very critical so a variance of 1/2" from the table values won't make much of a difference…so long as both sides are equal in that variance. The width can also vary by 1/4" or so.

On both versions you will want to check the heights of the bottom at the bow and transom…both ends should be about 4 1/2" (Rowing version) with the center resting on the floor or work surface. On the motorized version you should have 6" at the bow and the transom end should be flat on the floor and there should be no humps or bumps in the flat run from the mold aft. Block the Row boat at this height so it won't rock on you (the motor version should stay put but you can block it if you want). What you want to do next is measure from the very tip of the bow along each side to a point that is 3 or 4 feet **along the curve**. Mark this point and then measure from a top corner of the transom to the mark on the **opposite** side panel and write it down. Do the same on the other side and bang, bump and twist the hull until the measurements match. Take some scrap plywood strips and tack it at the corners and the points, making an x across the boat to hold it square. Examine the boat from all sides to see if it looks square and not twisted. Once you are satisfied, take your roll of tape and lay strips out along the dry joint to measure them out. Have enough to overlap at the transom and stem corner areas. But wait you say…what about the mold??? Leave a 3" space on either side of the mold unfilleted and taped…you will pull the mold later and fill it in.

Once this is done you are ready for some filleting. If your ties are tight and you have some gaps due to wobbles when you were cutting, put some duct tape on the outside to keep the epoxy from dripping through. The easiest way (**much less sanding**) to do the inside is in one shot. This is easier with some help, but you can do it by yourself too. Step one is to wet the joint with unthickened epoxy so the wood doesn't absorb too much from your filleting mix. Step two is to mix up a batch of filleting material to the consistency of peanut butter. Do not mix too much and use a container that allows you to spread it fairly thinly across the bottom of the container. Use about 5 or so ounces of resin at a time (depending on your ratios) and add the filler to that. Take a tongue depressor or a similarly shaped stiff plastic object and scoop up some putty and lay it into the joint, shaping it into a smooth curve from side panel onto bottom panel, with a good

¼" – 3/8" depth at the center. Run down one whole side, then mix up a small batch of regular epoxy and take a disposable brush and wet the surface of the fillet, smoothing it as you go. Don't push too hard as you don't want to deform the fillet. Wet the side and bottom as you smooth the fillet to a width slightly more than your fiberglass tape. Take a length of tape and lay it into the fillet being careful to keep it relatively centered. Carefully smooth it into the fillet and onto the panels. The glass will soak up some of the epoxy so all you will have to do is wet out the white spots if any. Do the other side joint. At the transom and Stem ends overlap the tape in the corners, making sure to fillet up high enough on the transom end so there is fillet under the tape overlap area. Just a little bit is needed at the stem, just enough so there are no air pockets under the tape. You do not have to tape the Stem all the way up, but you can if you want to…it's up to you. You should seal the joints between the stem and the plywood with a little putty though. You will want to fillet and tape the transom to side and transom to bottom joints so do these next…while things are still sticky. Now you can let the whole thing cure overnight (follow the directions of your epoxy as to the temperature needed to cure). If you are a real stickler for perfect joints…you can fillet the joints then sand them to your satisfaction, glass then sand to your satisfaction…you get the picture. After the joints have cured overnight it is time to sand them, feathering the edges of the tape into the wood. If you have weave showing, you can carefully wash off the blush (waxy coating) of the epoxy with water and a green plastic scrubby pad, dry it off then fill the weave. You can use plain epoxy in numerous light coats re-applying while the surface is still tacky to avoid having to clean off the blush each time. You can also use epoxy filled slightly with Cabosil or Micro balloons to fill the weave in one shot. Once you have the weave of the cloth filled and cured, sand a bit to smooth. When you pull the mold, sand the epoxy/glass ends to give it a bit of tooth and fill and tape the gap using the same method as above. Glue and clamp or screw the transom doubler on, making sure to coat all the edges with epoxy, letting it soak in.

Assembling the Hull Chine Log Method:

To begin assembly of the hull, we need to attach the chine log to the bottom outside edges of the side panels. The best way to do this is with glue and lots of clamps…but you can drill and use small screws to help secure the chine log too. Screw through the plywood into the chine log, making sure you pre-drill the holes. Do not countersink the heads with a countersink, but instead crush the surface ply with the head of the screw so that it sits flush or slightly indented. Also make sure that you use a drill bit that is the same size as the shaft of the screw or just slightly smaller. Only the threads should cut into the wood. Use some soap or wax to lubricate the threads of the screws to help them go in easier and prevent the chine log from splitting. Once you have the chine log attached and the glue has cured you can remove the screws and fill the holes or simply leave the screws in…up to you. Seeing as you aren't going to fillet the transom in you will have to put some additional framing on the interior side of the transom. Glue and screw on some 2" X 2" (motor version) or 1"X2" (Row) framing, beveling the bottom framing piece to match the bottom/transom angle. Make sure to use sufficient glue so that it squeezes out all the way around when you glue and screw. When that is cured you can

start putting the boat together. Here you need to preplan a bit… (See Stitch and glue method for details on the stem) Start at the front (bow) and glue and screw the side panels to the Stem piece…again, drilling first. Line up the panels so they extend just a tad past the forward edge of the stem and mate together nicely along their edges. You will need sufficient space for the side panels to Vee outwards while you do this. Once the side panels are attached to the Stem you can attach the transom to one side of the panel and bend the other side to meet it. You may need someone else to help you or you can sling a rope around the other side panel and kind of walk toward it and reel it in at the same time. The length of the panels will give you lots of leverage. When you get them together, tie a quick knot to keep things almost together, then glue and screw this side to the transom. When gluing, make sure you get squeeze out all the way around, this ensures a good seal against water. Once the glue has cured you will sand or cut off the excess off anyways. Take your mold and nail it in with a few finishing nails at the correct spot. Flip the hull over, support it off the floor a bit and lay the bottom panel onto the chine logs, lining up the transom corners with the bottom edge of the plywood. If the side and bottom edges don't match as you go forward, muscle the side panels a bit to fit. There should be a bit of excess at the bow that will need to be trimmed off later. Glue and screw the bottom to the chine log…again…pre-drilling the holes. If you left the screws in the log earlier, try to hit in the middle between them with the bottom screws. Once this is completed, you can flip the hull over and square it up using the same method as described above in the Stitch and Glue section. If you got your cuts accurate and everything lined up right it should be pretty darn square from the gitgo.

Bracing pieces:

Install 1"x2"stringers on the inside bottom of the boat to stiffen the floor. The stringers should end about 2" in front of the transom and should end 2" before they touch the sides as they bend inwards at the bow. Screw them from the bottom making sure to get good glue squeeze out so the joints are sealed (hint…mark the correct spots on the inside then drill from the inside outwards. Lay the stringer centered in position and drill up through the holes. Install the first two stringers, wide side down, dividing the bottom into 3 equal widths then put one down the middle of each of the remaining spaces for a total of five. (Rowing Version only): Finish framing the transom by gluing and screwing additional bracing as shown in the accompanying drawing. (Both versions): Next it is time to install the knees that go in the transom/side panel corners and the two that brace the bottom of the transom (Motor version only). Knees are triangular gussets, usually with a decorative curvature on the inside edge used to brace angled joints. A couple of drawings and pictures are enclosed. TIP: You can find decorative 90° shelf supports that can be used for 90°knees…you just have to bevel one edge to match the transom angle. For the knees that brace the transom/side joints you will need to decide if you want to butt the inside wales against these knees or install the knees under the wales. The two that brace the transom/bottom joint should run from just under the doubler at a 45° angle to the bottom of the boat, landing on those two stringers you installed first. These knees should either be filleted and taped

(preferred) or cleated in. You must make sure that you seal all edges and that all the joints are waterproofed if using plywood for the knees. You don't want water getting into the inner plys. The open spaces at the ends of the stringers leave room for water to run to the drain hole. If you plan to box in the area behind the seat you do not need the knees as the box sections provide plenty of support (Motor version only).

The Breasthook: As stated before, this is a triangular piece that fills in the bow area and provides strength, support and visually and physically ties the two sides of the boat together at the bow. It is usually somewhat arrow shaped, with a decorative curve cut into the open edge. The way to make this is to take your chosen stock (solid wood or plywood, ¾" thick or more) and lay it on the top of the hull in the bow, butted right up against the stem if it sticks up. Trace the outline of the opening on the bottom by following the hull panels. Cut out the panel then carefully bevel it until it fits in snugly. Before installing the Breasthook caulk the joints between the Stem and the plywood panels if you haven't already filleted them. To install the Breasthook glue a couple of cleats on the hull for it to sit on or then glue it to the hull and cleats. Make the cleats short so you can run the wale up under the breasthook for a more professional look. If you still have the excess stem sticking up here, you can carve it up or shape it any way you want. Drill a 1/2" hole through it to tie a rope to and away you go. If you put the Breasthook on top of the stem, and there is a bit of a gap between the stem and the breasthook, go ahead and glue up a thin wedge and tap it into the gap to join the top of the stem and the bottom of the breasthook.

Wales or gunnels or rub strips or whatever you wish to call them serve a number of purposes. They strengthen and stiffen the shear of the boat, act as spacers to help keep the hull panels from contacting things, they are strong points to attach cleats to or to bolt other things. Wales usually consist of an inner and outer strip or a gunnel (Gun Wale or Gun Rail) (inner) and rub rail or strip (outer). The simplest ones are strips that sandwich the hull panels along the shear, mounted directly to the hull. For this boat…being as it's intended use is for duck hunting and the like…I would recommend the more complicated but more useful form of gunnel which is spaced off of the hull. This consists of a series of evenly spaced spacers mounted on the inside of the hull at the shear then the gunnel mounted to the spacers. Not only is this stronger because of the I-beam effect of the spacers, but it provides a plentitude of places to tie stuff to, or stuff camouflage into, without having to mount additional hardware. The spacers are simply 1X stock cut into 2" lengths and mounted with 4" between each block (this is approximate, as you want to have them evenly spaced all along the hull). The 1x rail is then mounted on these blocks, giving you the same strength as a solid 2x rail minus some of the weight and being much easier to bend into place. When assembling this type of rail, mount your blocks to the hull then paint the surfaces that aren't to be glued because it is much easier to paint them now than after the rail is mounted. Prior to painting, temporarily mount the inner rail and mark where the blocks fall, so as not to paint the areas to be glued, then prepaint the inside of the rail where it meets the blocks. For a more professional look, you can bevel everything so that the tops of the rails are horizontal or you can leave them angled outwards with the flare…your choice. The outside rail should have the thickness of the side panel routed from the contact side, leaving a ¼" cap at

the top to cover the edge grain of the plywood. The inside rail should be raised ¼" to match the outside rail (See detail sketches). The inside rail should be installed after the breasthook and knees are in place so that you can blend things together nicely. You can butt the inside wale against the breasthook or notch it to run under the wale for a bit. You already decided earlier whether to butt to the aft knees or go over them. The outside wale can be installed now or after finishing the outside of the boat and just prior to painting the exterior.

Seating:

Seating for either method of building can be done in a couple of ways. The simplest method is to glue and screw or bolt cleats to the sides of the hull and attach plank type seat tops to these cleats. The harder method is to create seat boxes that are sealed chambers. This is the preferred method although it involves quite a bit more work. To build the box seats… the easiest way is to build them outside of the hull and simply install them where you want, screwing them to the bottom stringers and through the sides. Fill the seats with empty 2 liter bottles secured with canned expanding foam or cut sheets of Pink insulating foam for unbeatably cheap flotation. To ensure the bottles don't collapse when chilled, stick them in the freezer with the caps off for a few minutes then cap them tight. The bottles will not collapse unless they get colder than the air in your freezer. You may only wish to build one box seat and leave the rest as plank seats…up to you. (Motor version only) To build the seats, use the same measurements as you would for the transom…at least for the seats that will fit in the straight aft section. When you have the transom shape drawn, subtract an amount equal to the depth of the bottom stringers from the bottom edge and the amount you want the seat top to be below the sides of the boat from the top edge, taking into account the thickness of the seat top too. This will give you a pattern to make your seat front and back panels from. Make square side panels to the size you want the seat to be fore and aft, minus 2" (for the overhang of the top). (Both Versions)These seat boxes can be made of ¼" ply to save on weight but you must remember to thoroughly seal the whole thing…you don't want water getting in and rotting your seats out. Frame the entire top of the box so you can caulk the seat top when installing, allowing you to remove the top for inspection now and then. An even niftier option is to partition the interior into three spaces, keeping the middle one hinged and open for storing stuff. Use auto door gasket to seal the hinged seat top access. Just make sure that you make your side chambers big enough to put the bottles in or you won't be able to use bottles for flotation…but you could always use the screw top 1 gallon or ½ gallon milk jugs as an alternative, just be sure that they are clean.

(Motor version only) Seating arrangements are very flexible…If you have a tiller motor, make sure your seat front is 30"-36" ahead of the transom depending on how tall you are. I would definitely make this a box seat, and I would probably box in some of the space on either side of the motor area and fill it with additional flotation (I did this with Fisher10… see pictures). You will want some leg room in front of this seat so the back of the next should be no closer than 36" from the front edge of the rear seat. If you omit this middle seat, make a short frame that extends up the sides to the inside wale to help stiffen this area up. A 2x4 with 2x2 side arms and

plywood gussets would be fine. This frame should be attached to the floor stringers like the seat(s) and be glued and screwed to the sides. The front seat can be a plank seat (easier to fit to the curves of the sides), with some 2" foam glued to the bottom side for flotation. Put trim pieces extending downwards from the bottom of the seat to hide and protect the foam, and paint the bottom of the foam. The trim pieces should be set back from the edge of the seat by a bit. For seat tops, you want them about 12"-15" front to back width, so you will probably have to use either ¾" ply or some nice edge glued shelving pieces. You will want to have about 36" from the front of the front seat to the stem for leg room and storage of anchor, rope and stuff.

Another option is to have remote steering. The boat is plenty wide enough to have either a center steering console or a steering console to either side. This system moves a lot of weight forward and better balances the boat fore and aft, though a side consol will cause the boat to list a little to that side when you sit there just like any other small boat set up this way. Your remote controls will determine how this needs to be set up. A console is easy to make, just look around for ideas on how you want to shape it.

Once the front and rear seats are in place you can pull the mold, fillet and tape the gap (Stitch and Glue) and install the center seat or frame and center console or side console

(Rowing Version only) You will have to have a center seat for your rowing position and you can have your aft seat further back as you do not need room to steer a motor. Box seats will be more difficult to make as you will have to measure each separate box wall and custom fit the tops due to the constant curve of the sides on this version. As you are not supporting the weight of a motor or fuel, you might choose to have only the center rowing seat as a box with flotation as it is easier to fit and the seats at either end as plank seats with foam underneath. You can also have the aft seat attached to the transom. In this case…the seat should be at least 18" deep from transom to forward edge… for comfort. Position the Rowing seat centered on the Maximum beam station and your oarlocks approximately the length of your forearm from elbow to tip of little finger aft of the back edge of the seat. Test this position and adjust from there.

Finishing the interior:

The Drain: Face it…water WILL get into the boat…so you need a way of getting rid of it. You need a drain hole. This normally goes through the transom at the center (which is partly why you spaced the transom knees apart on the motor version). There are a few ways of doing this. First…you can simply drill a hole and seal it with epoxy but you can't be sure if you really sealed it all the way around and you don't want water to seep into your transom layers. Second is to drill an oversize hole and glue in a piece of PVC pipe then epoxy over that. This works. Third is to drill an oversized hole, fill it with epoxy putty then drill the correct sized hole into the epoxy. This is by far the best method in my opinion as you absolutely know the edges are sealed. A 1" drain hole is fine and 1" plugs are available everywhere. You can even use a cork in a pinch. The drain hole is optional in the rowing version as the hull is significantly lighter (and no motor attached) and can just as easily be flipped onto its side to drain any water in the boat.

Sealing Joints: All corners, joints and edges should be sealed…preferably with epoxy although some construction adhesives do a fair job. Silicone caulk won't do the job…nor will latex unless you paint the corners/joints first very well, let it cure then sand to roughen and calk…pressing the bead into the joint very well. Any pealing at all requires an immediate re-caulk…better to be sure and use epoxy prior to painting. In fact…coating the entire interior with epoxy is an excellent idea to help your boat last a lot longer…but it isn't necessary.

Smoothing and Sanding: Be sure to round over the seat edges very well, and round any sharp corners too or sure as sin you will find them the hard way with sensitive parts of your anatomy.

Finishing the outside-Stitch and Glue method:

To finish the hull, flip it over and sand to round over all the seams. If there are any holes or gaps, use epoxy putty to fill them then sand smooth. Using tape or strips of cloth, tape all the seams making sure to overlap at the corners. Let this cure, fill any showing weave and after curing…sand smooth and feather the edges. When using A/C Exterior or Fir marine plywood, be careful about sanding the faces of the wood. There are layers of harder and softer wood in the grain and when sanding you will remove more of the soft than the hard, making the surface more uneven. This doesn't apply to most of the imported marine plywood like Luan, Gaboon, Meranti, Sapele etc. You can now add a layer of cloth onto the bottom for abrasion resistance if you wish. I would recommend it if you plan on using it in an area with sharp rocks or lots of floating debris. The final installation should be bottom rub strips that are glued and screwed through the hull into the stringers on the inside of the boat (Pre-drilling of course).

(Rowing Version only) You will probably want a small Skeg or fin to help directional stability. See the attached drawing for an example of a skeg and the offsets for the curve where it attaches to the hull are in the offset table. The skeg can be of solid 1x stock or laminated out of 2 3/8" pieces of plywood (better as it has less chance of warping) and is attached to the hull using two strips of 1x stock (3/4" x 1") to create the center rub strip. Notch the strips for the skeg and glue and screw to the hull and through the skeg from each side. You might only wish to add one other rub strip on either side as having all 5 like the motorized version is unnecessary weight.

Finishing the outside-Chine Log method:

Basically the same as above except you will want to round the corners of the chine log nicely, rounding the ends at the transom. Trim the chine logs and bottom panel flush with the edge of the stem and round them into the sides. Round over the stem and transom corner

seams and add a layer of tape as above. Round over the bottom panel/chine log seam and I recommend you tape this joint too. This is not for strength but to protect the end grain of the plywood from getting any water in it. The joint where the Chine log and side panel meet is a very bad area for rot so you must be sure to seal this area very well when painting. You can also caulk it or even better…put a small fillet of epoxy in there ensuring it is well protected. You can glass the bottom as above if you wish. Install rub strips as above.

Painting:

Depending on how pretty you want your finish to be will determine how much work you want to put into finish. For a work boat finish…a light sanding to give tooth, a couple of coats of primer and 2-3 coats of paint will suffice. For a gold plater you will want several build coats of primer, sanding between each coat, and many thin coats of paint…also sanding between coats. Color of course is up to you but some things to note…dark paint in hot sun doesn't do you or epoxy any good. Bright white paint inside will glare at you. Gloss paint shows the most flaws…flat paint the least but cleans the worst. Semi gloss and satin are the best balance for hiding and cleaning. Fir plywood WILL check (show cracks in the grain and possibly paint) in the sun unless glassed, regardless of the amount of epoxy or paint on it. You MUST put something on the wood to seal it from the water.

Powering:

US Coast Guard guidelines allow up to a 25 hp motor on the motor version of this boat. As a cautionary statement I say ***NEVER ***try to make a sharp turn at full power with the maximum allowed hp motor. Flat bottomed boats with hard Chines have the tendency to "trip" on the outside chine…flipping the boat over. Boats with a chine log also have that little extra lip to help in this tripping effort. Slowing down from full blast to a more reasonable rate (half?) will help ensure you stay in the boat… safe, dry and alive. Always wear PDFs when the boat is moving and wear an engine kill lanyard if you can. Start out easy and learn about your boat and its capabilities before testing the upper limits.

The Rowing version could conceivably accept a trolling motor with a tiller extension if you have a long way to go and a short time to get there…Up to you!

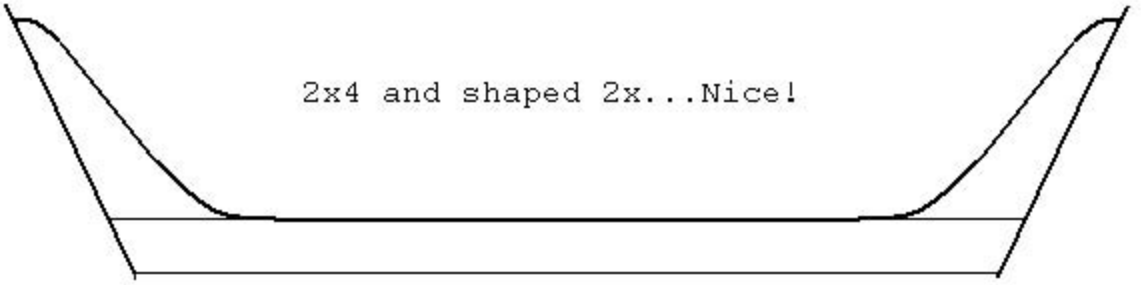
Oars should be about 7 ft long…there are plenty of sites with various styles out on the 'net which have free plans so I won't get into them here. You can also pole the boat with a 12-14 ft pole should you find yourself in an area of flats or lots of vegetation. You can use either of these options with either style boat though you won't go as fast and will work harder trying to row or pole the Motorized version.

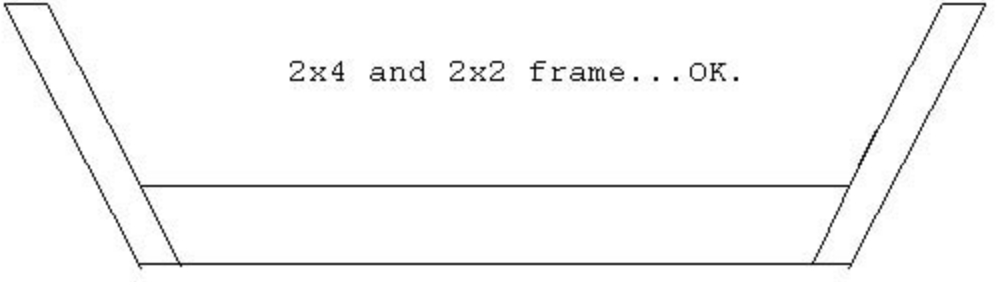
NOTE: The author of this work takes no responsibility for the construction of or use of either of the boats presented here…as he has no control over said construction or use.

List of Pictures and Illustrations:

- Duckskiff (motorized version) Linesplan
- Duckskiff (Rowing version) Linesplan
- Panel shapes (Motor)
- Panel shapes (row)
- Frame Detail
- Plank Seat Detail
- Boxed in motor area
- Stitch, Fillet and Tape detail
- Non-spaced gunnel detail
- Spaced gunnel detail
- Center mold
- Chine log detail
- Knee detail
- Spreader measurement and marking detail
- Breasthook example
- Transom half layout detail
- Transom bevel detail
- Short shaft detail
- Long shaft detail
- Transom framing for rowing version detail
- Stem detail
- Squaring the hull detail
- Layout picture one
- Layout picture two
- Batten
- Fiberglass butt picture one

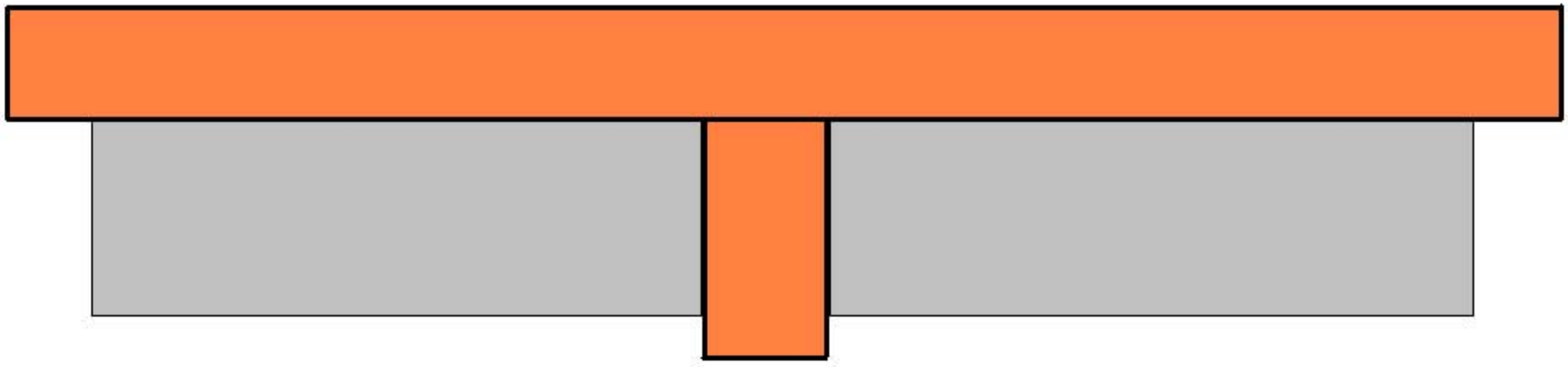
- Fiberglass butt picture two
- Fillet on inside
- Smoothed fillet
- Tape on inside
- Stitching one
- Stitching two
- Knee, Butt block and box seat picture
- Another knee picture
- Boxed in Motor area
- Non spaced gunnel
- Spaced gunnel (plywood plank edge covered)
- Spaced gunnel (solid planking edge left exposed)
- Outside seams dry taped and stapled into place
- Outside hull with fiberglass
- Skeg picture


2x4 and shaped 2x...Nice!

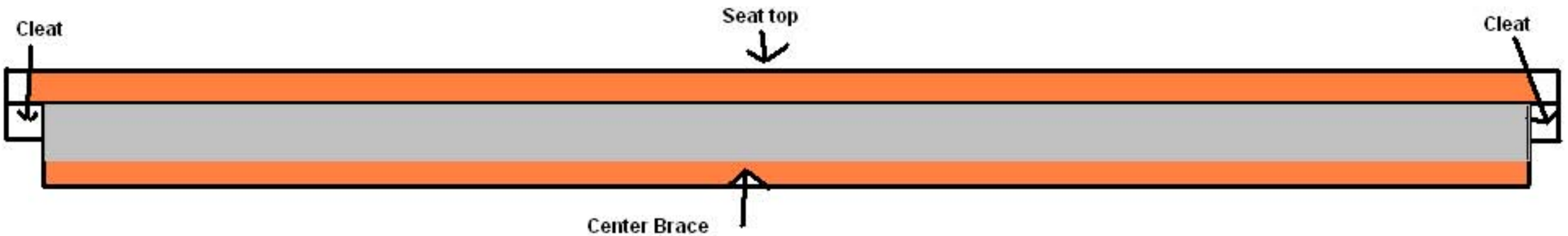

2x4 and 2x2 frame...OK.

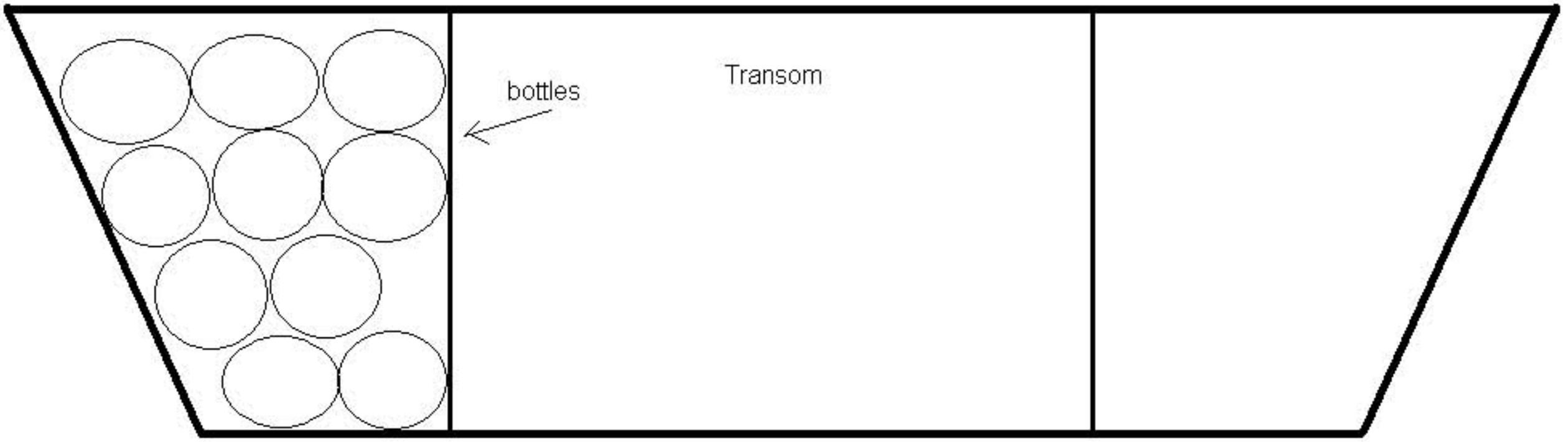
Simple seat detail

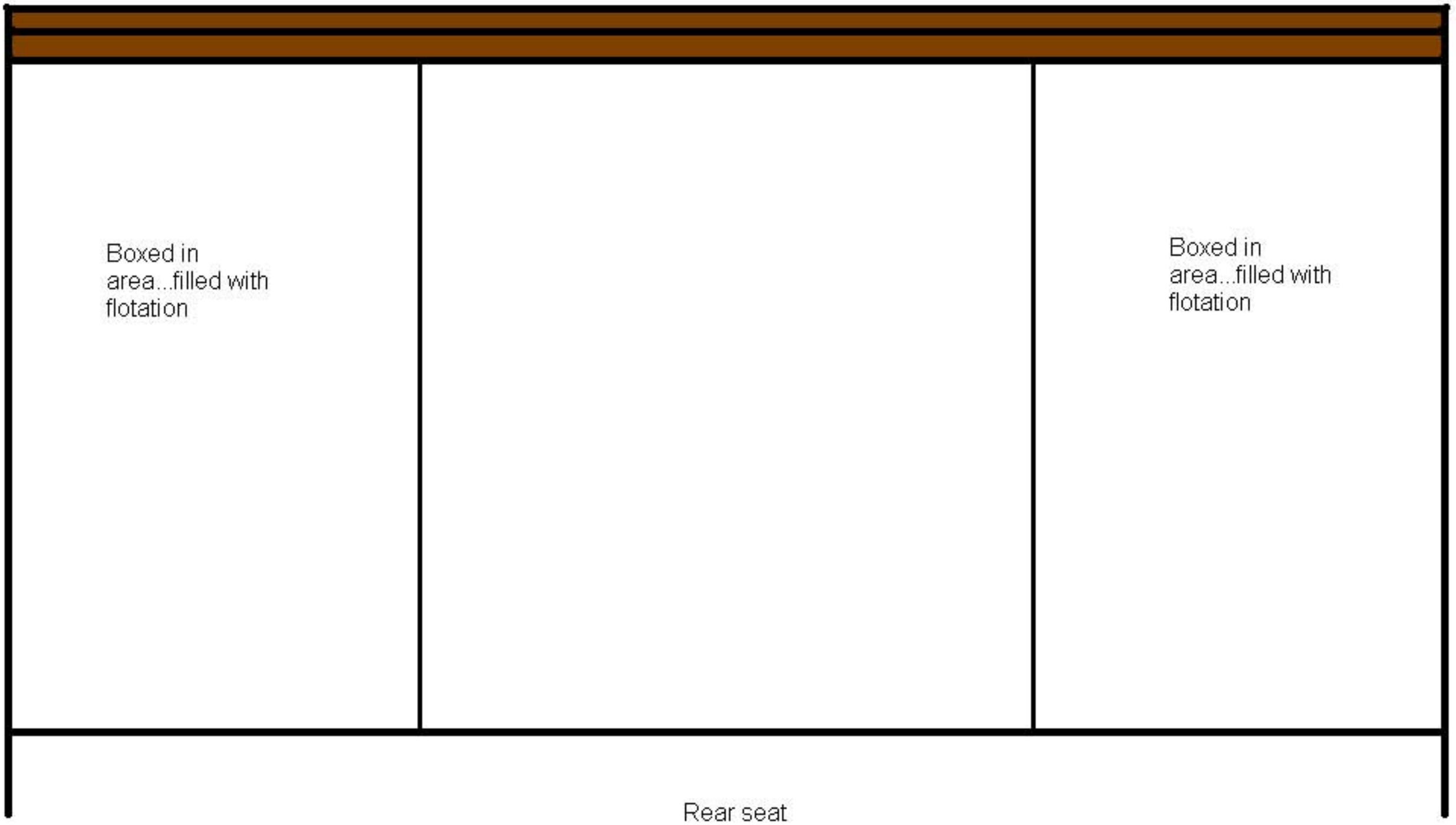
Cross section, seat and center brace.

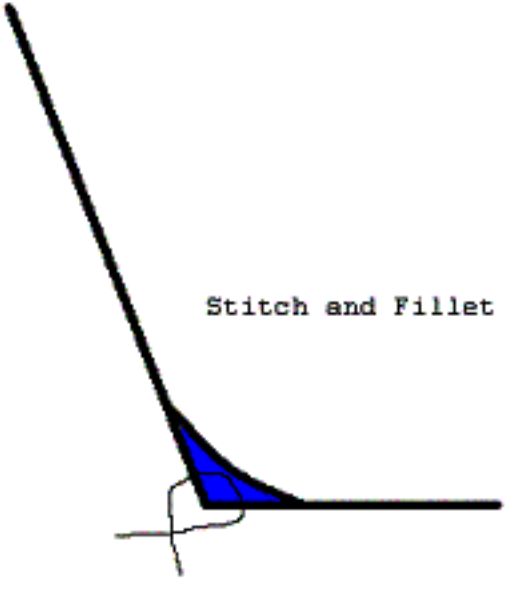


Foam under the seat...painted.
Seat width from 12-15 inches.
Cleats are 3/4x3/4 and center
brace is 1x2.




bottles
Transom

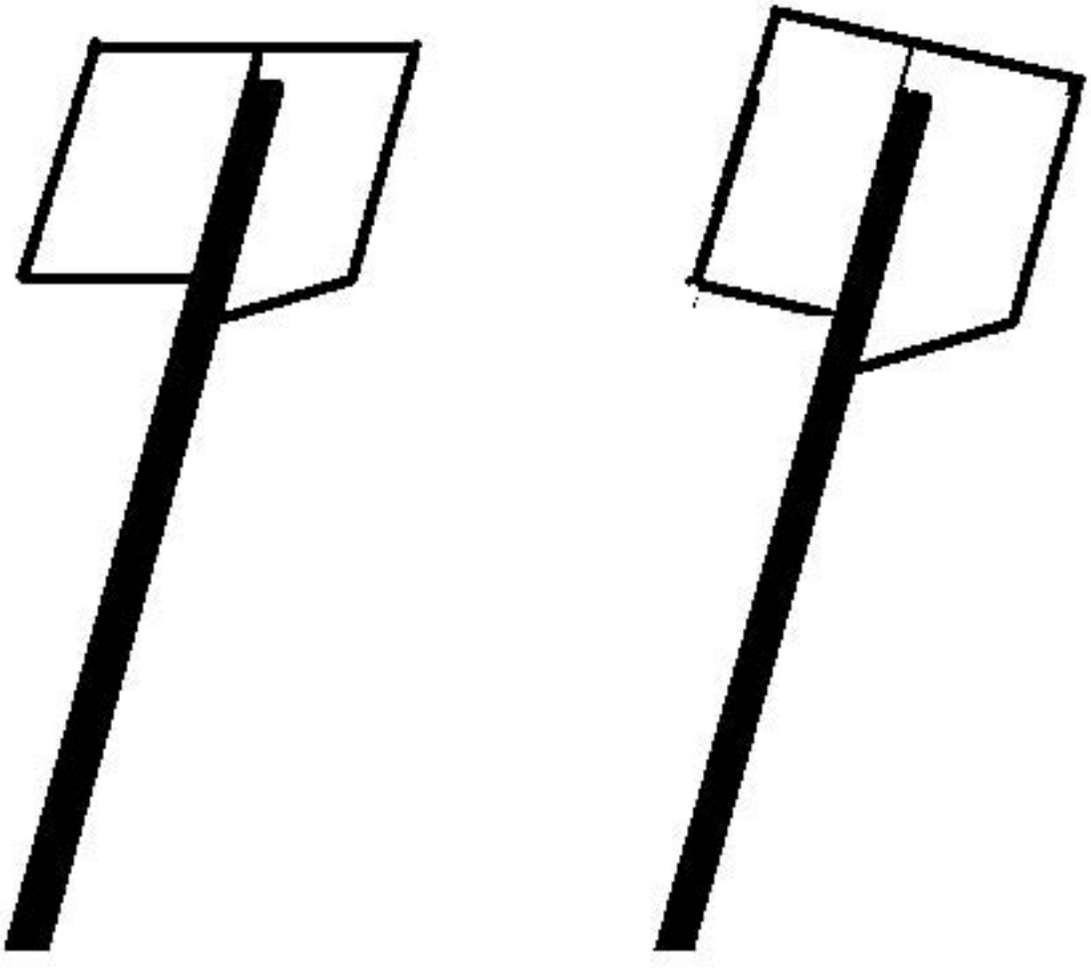

Boxed in
area...filled with
flotation
Boxed in
area...filled with
flotation
Rear seat



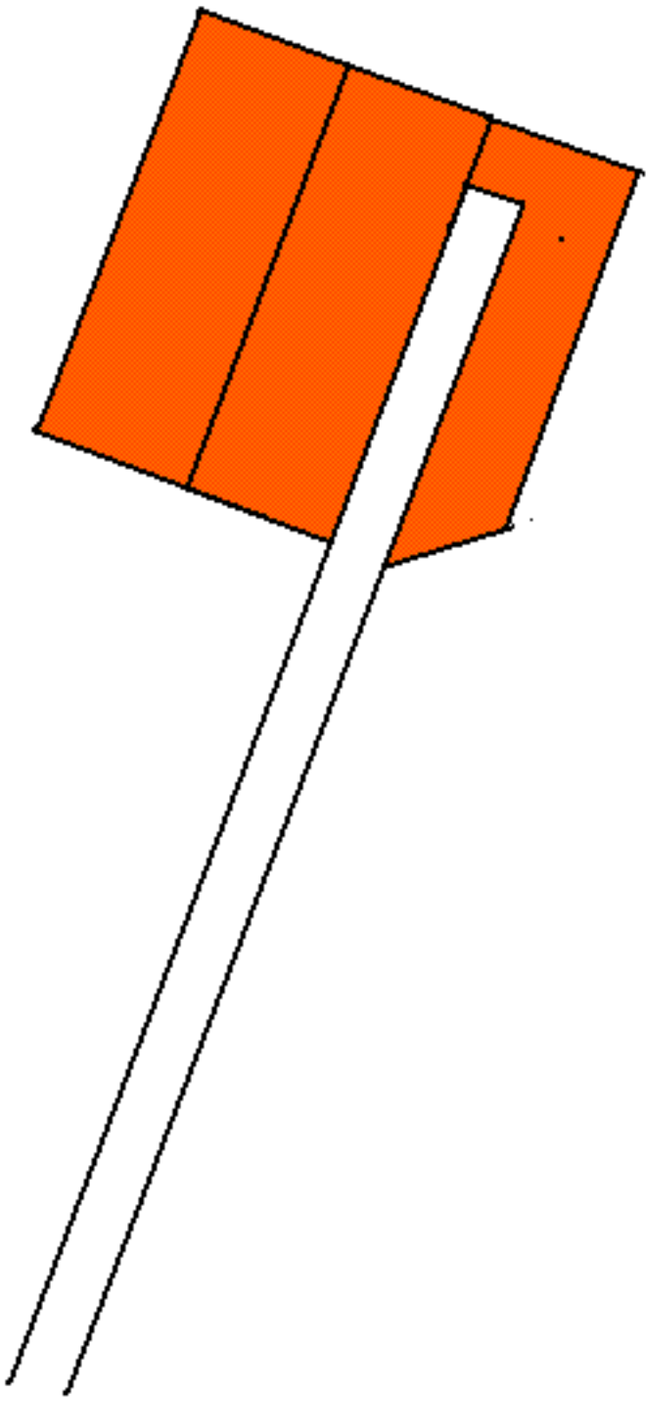
Solid, waterproof joint that is stronger than the plywood itself.

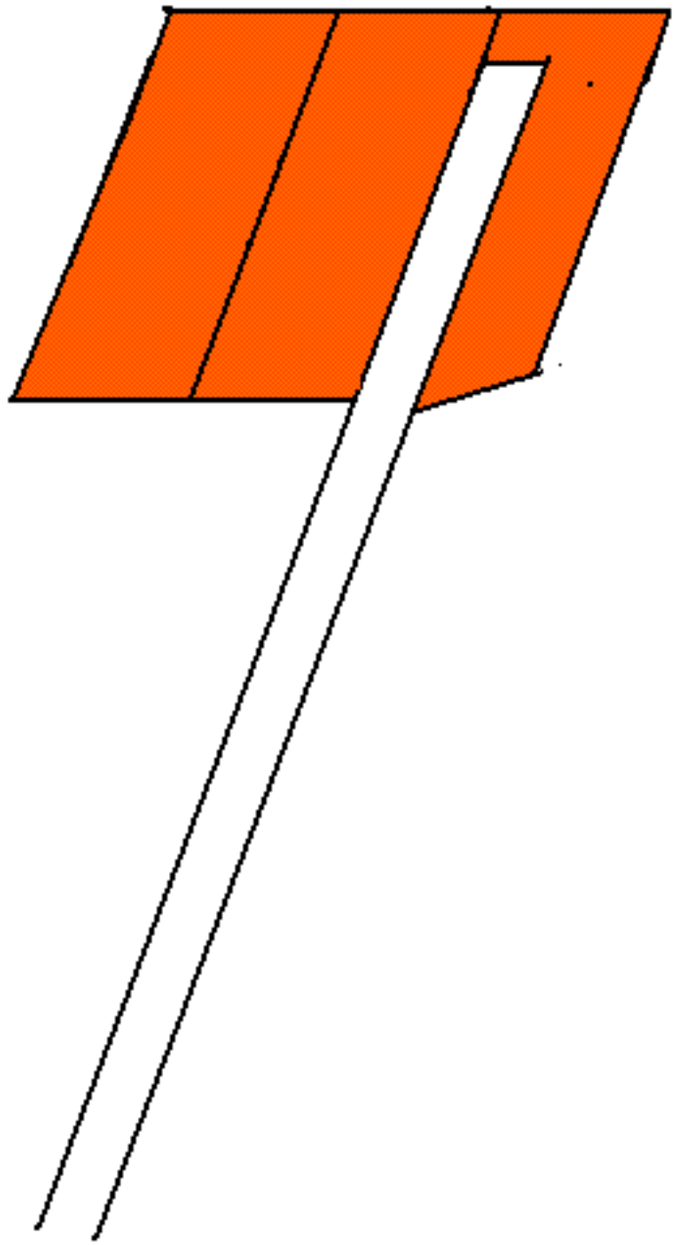
Detail for non spaced gunnel or inwale.

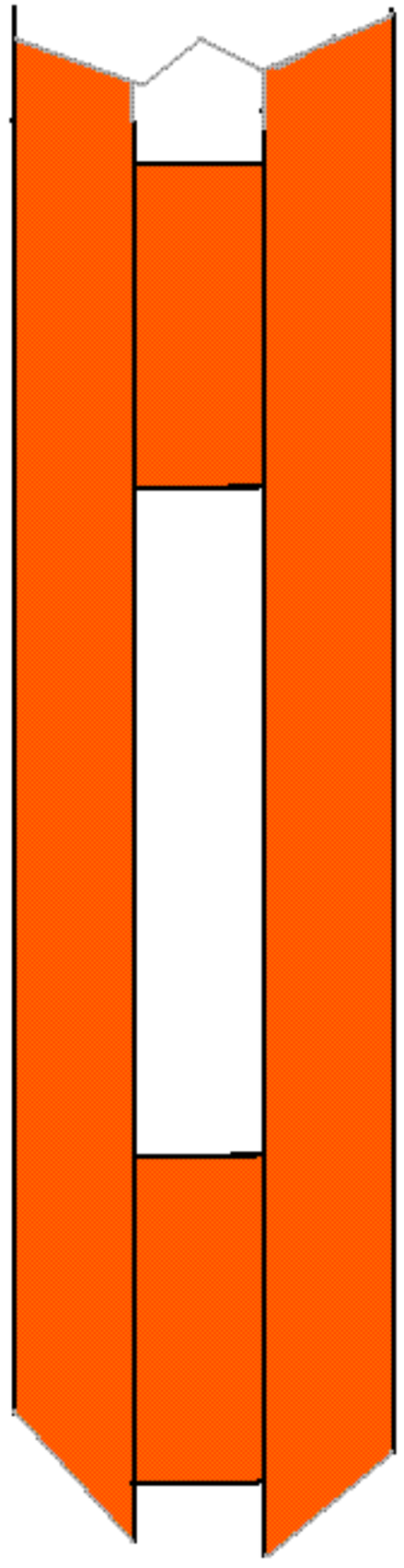
Outer wale or rub strip detail. Top is cut to 23deg, bottom is 30 deg. This allows water to run off when the boat is upside down, helping to prevent pooling and rot.



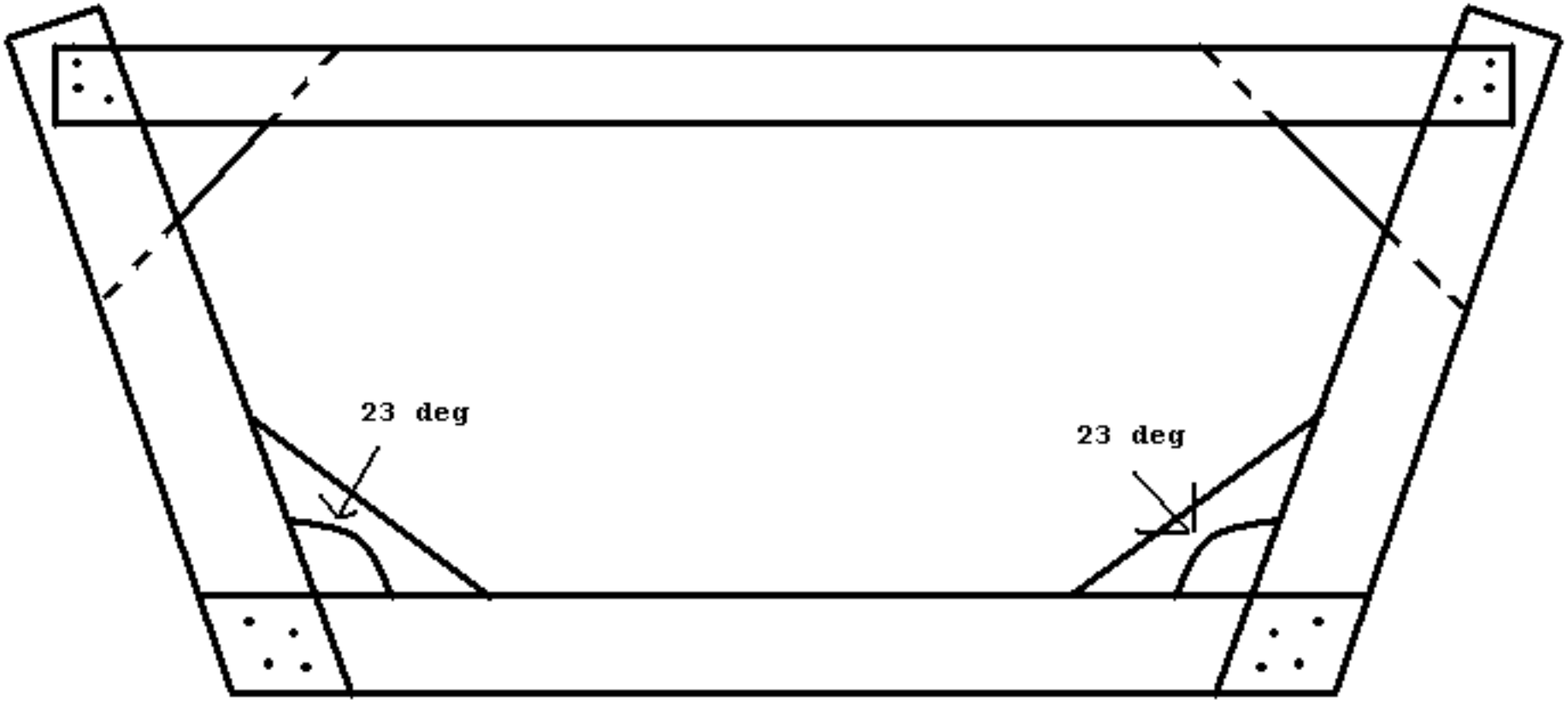
Inner and Outer Wale detail for spaced Wales





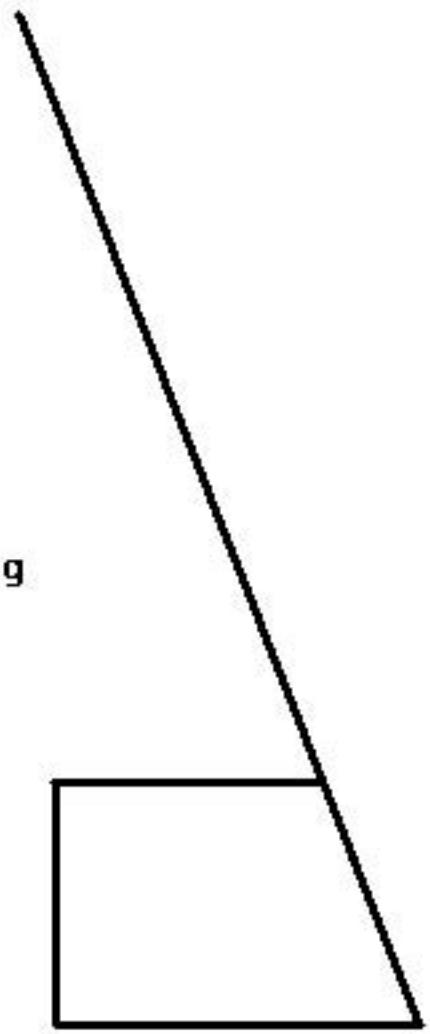


Center mould

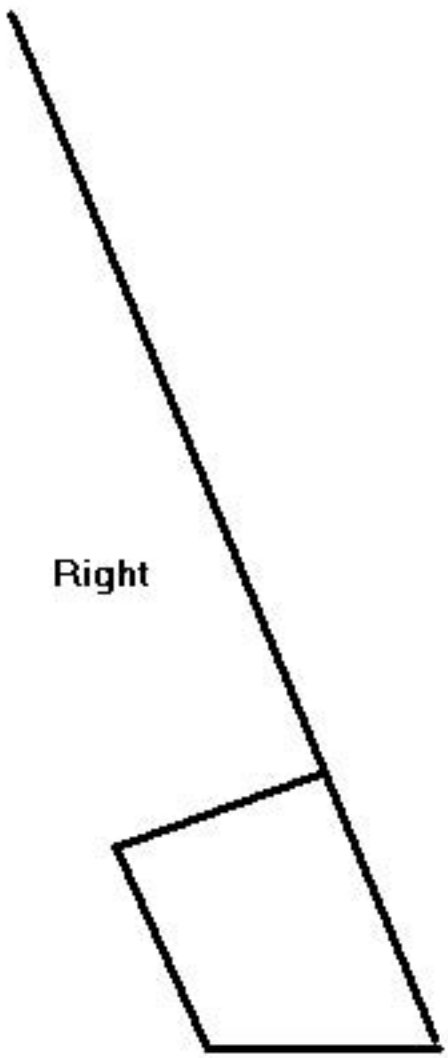


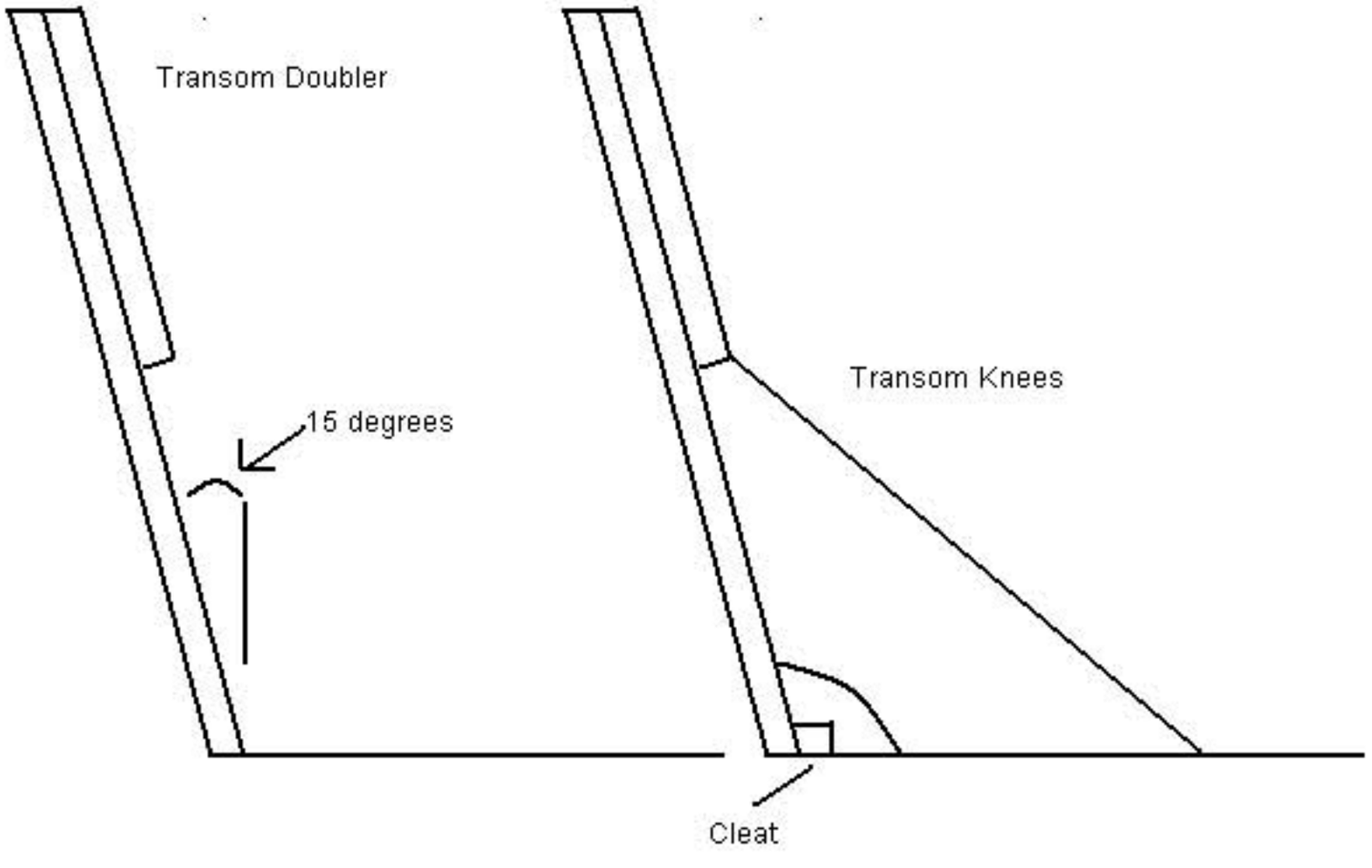
Furring strip for Chine log cut lengthwise at this 23 degree angle.

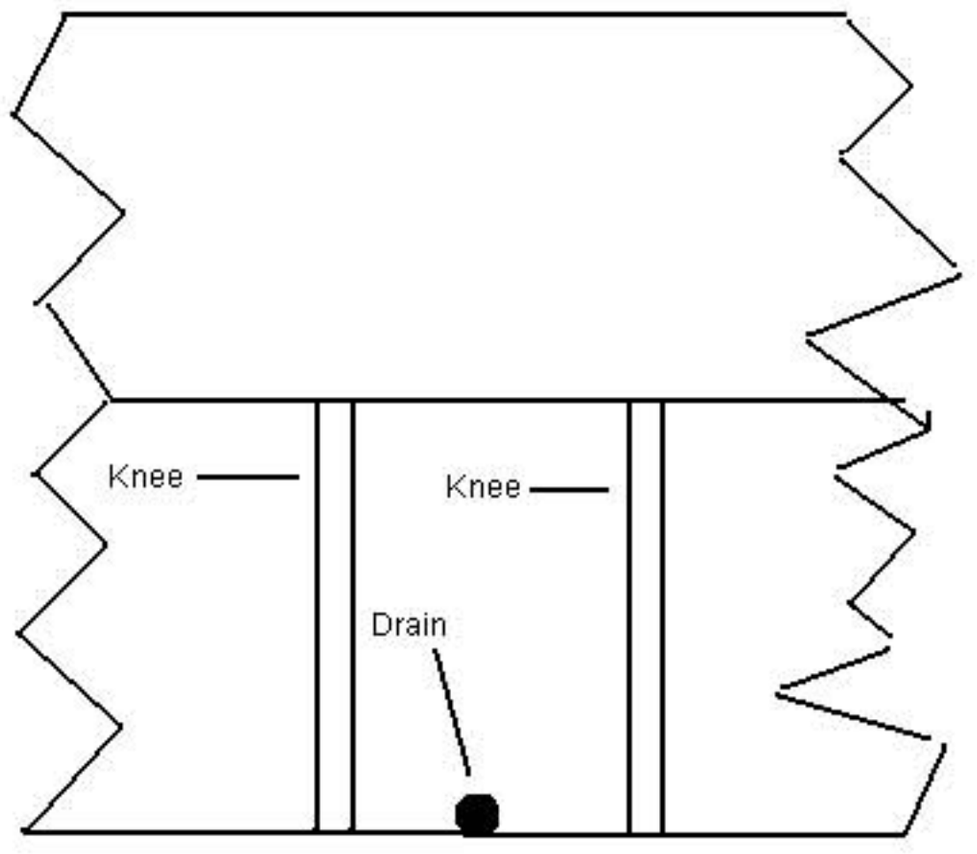
Wrong

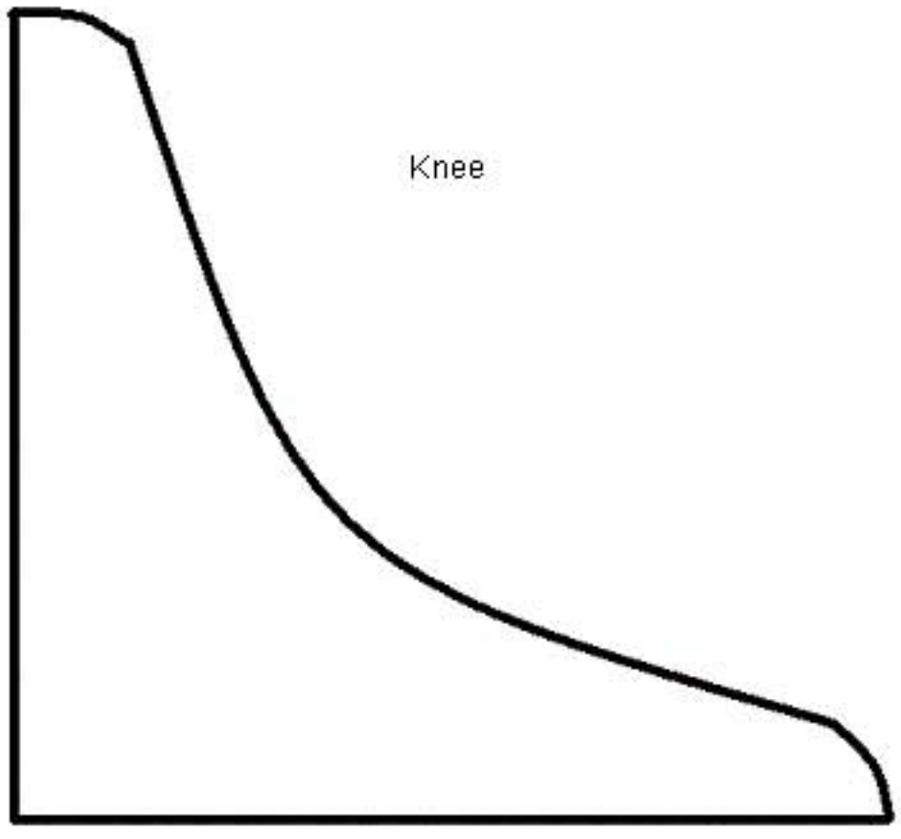


Right

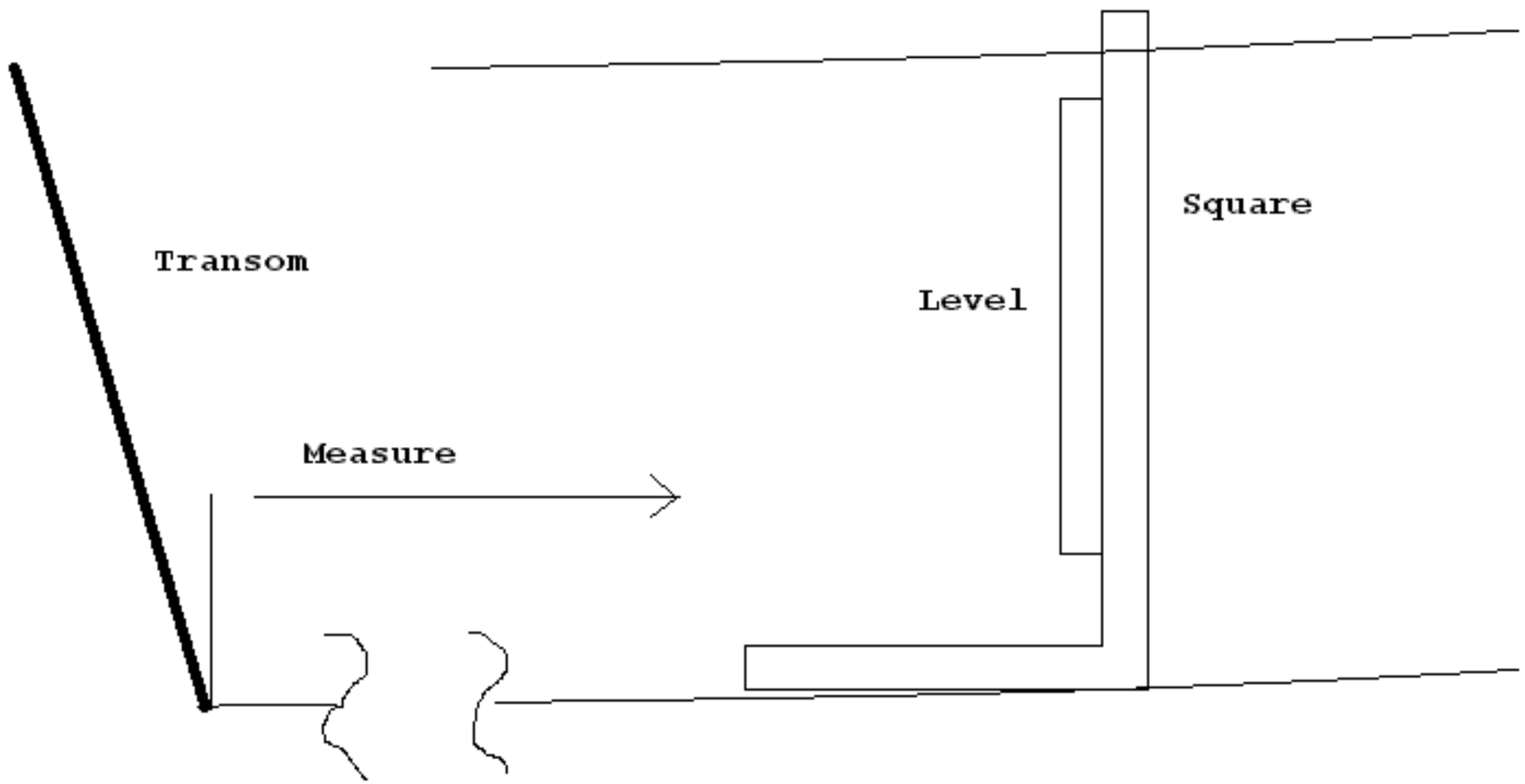


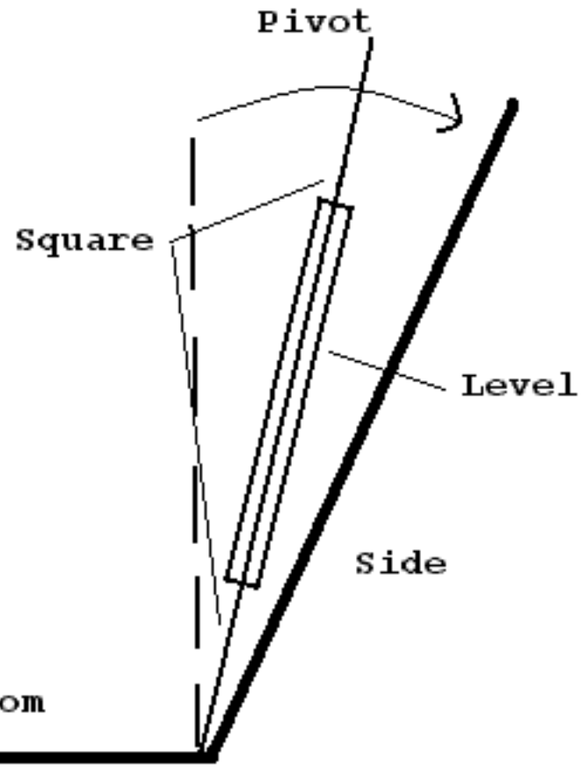

Transom Doubler
15 degrees
Transom Knees
Cleat

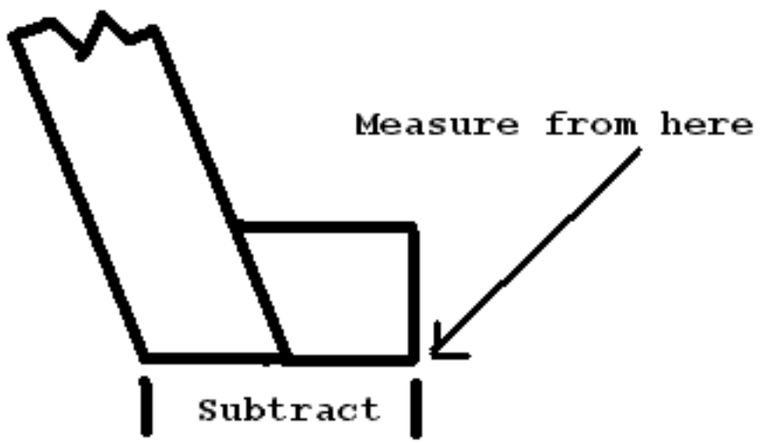

Knee
Knee
Drain

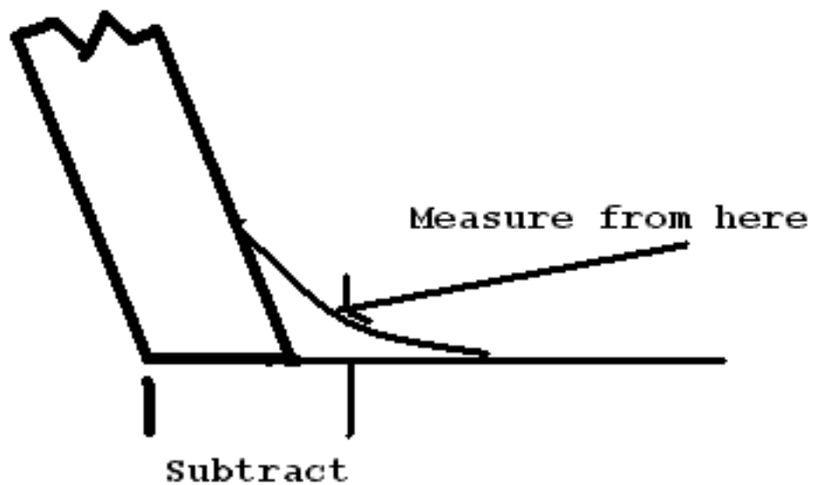

Knee

How to measure and mark positions for spreaders.

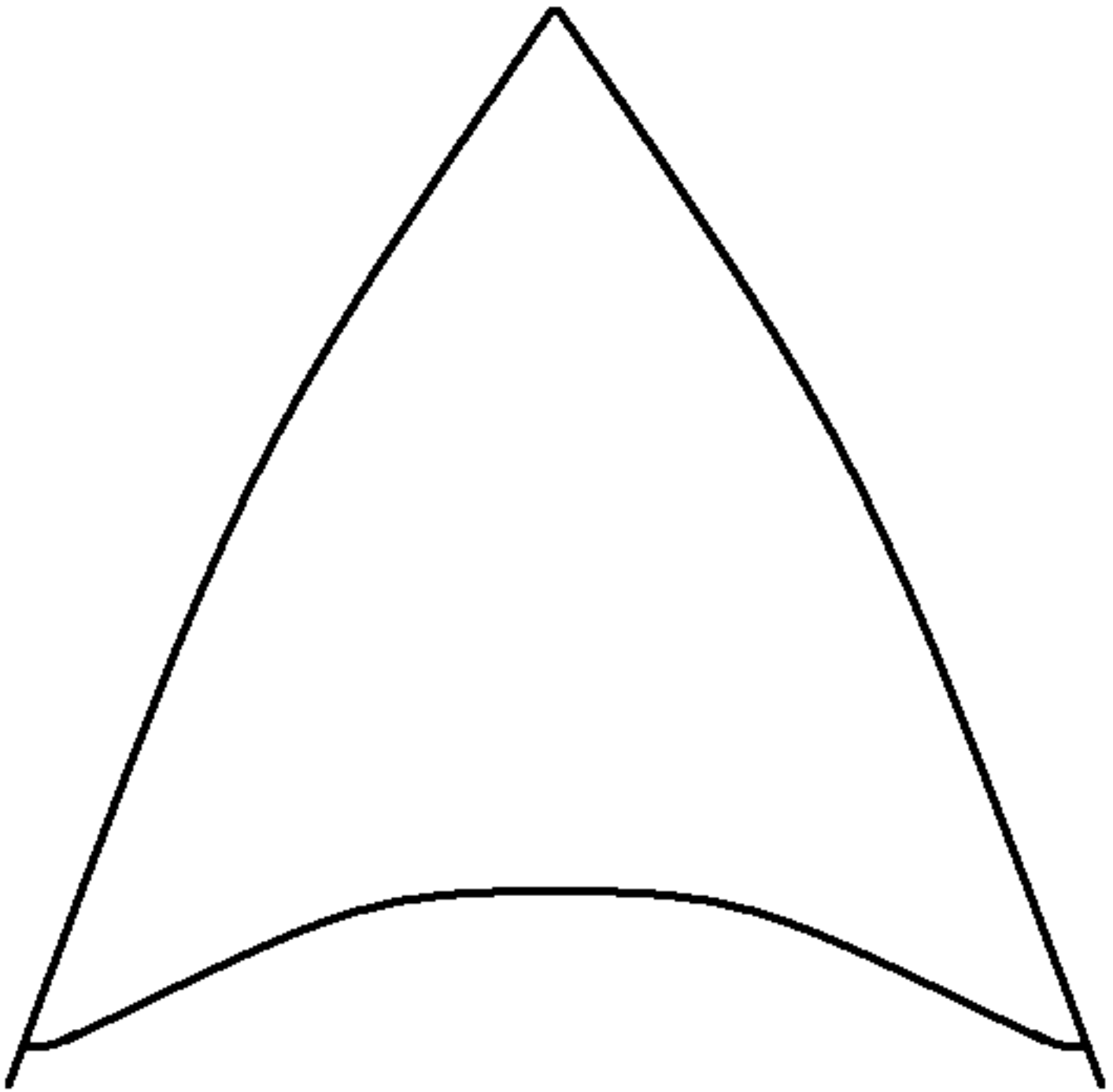




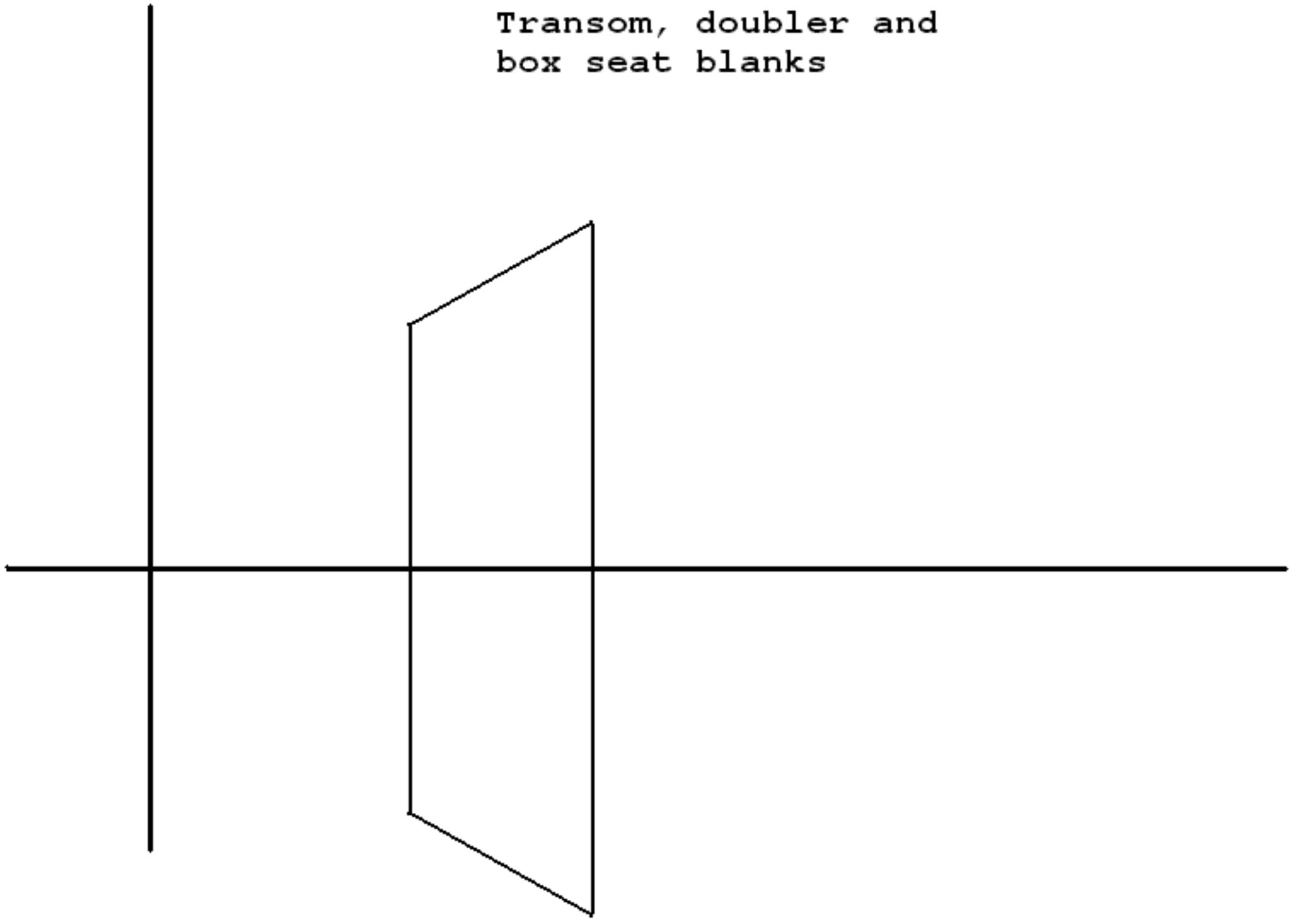




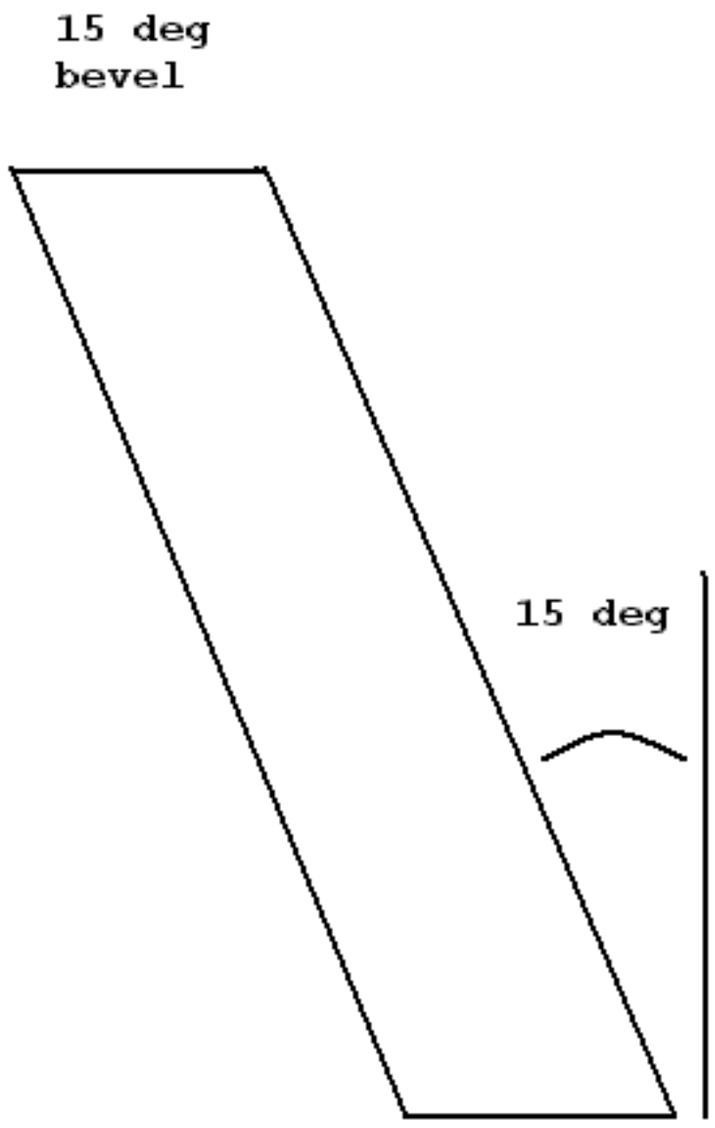
Typical Breasthook shape with curved inner edge.



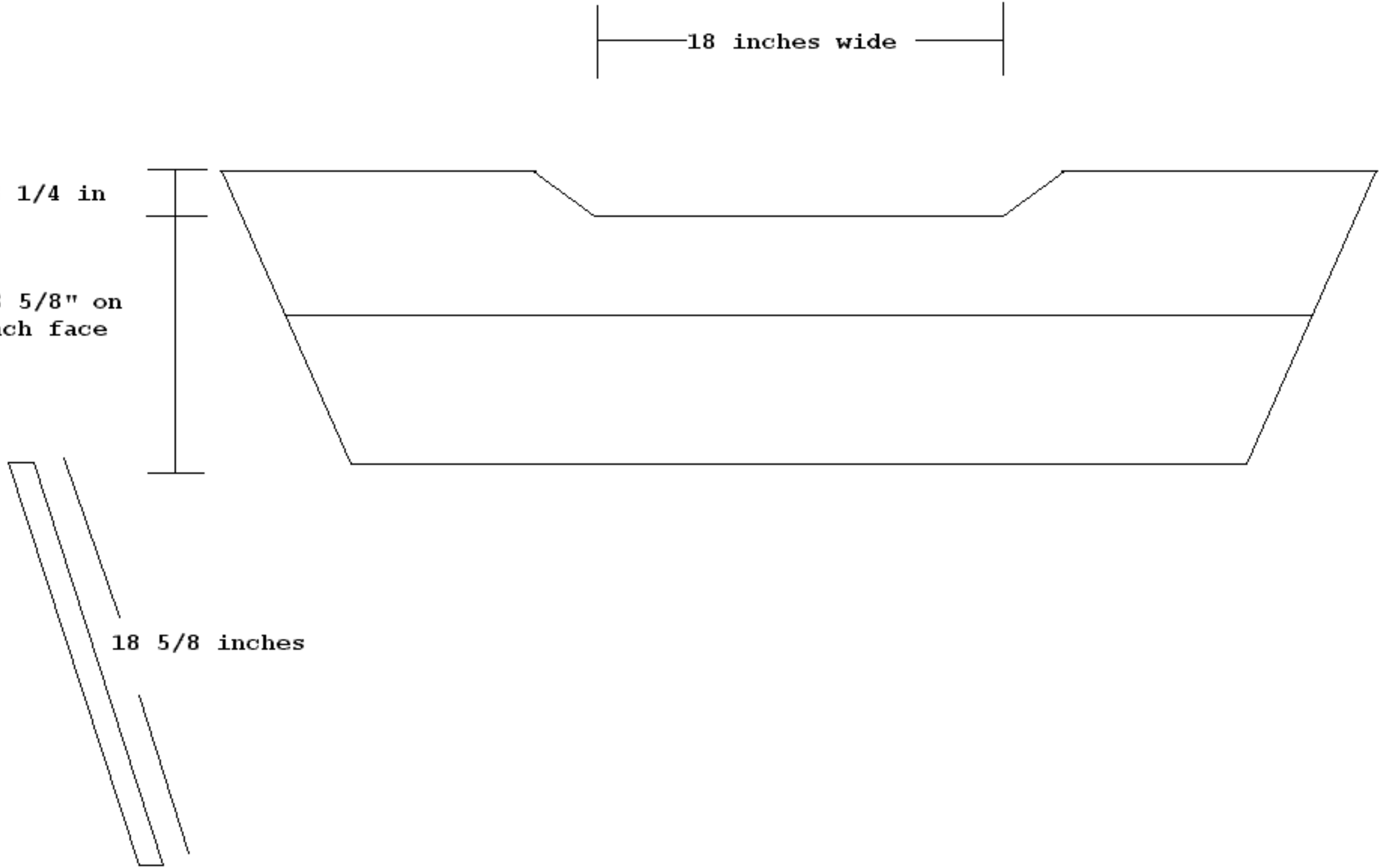
Transom, doubler and
box seat blanks



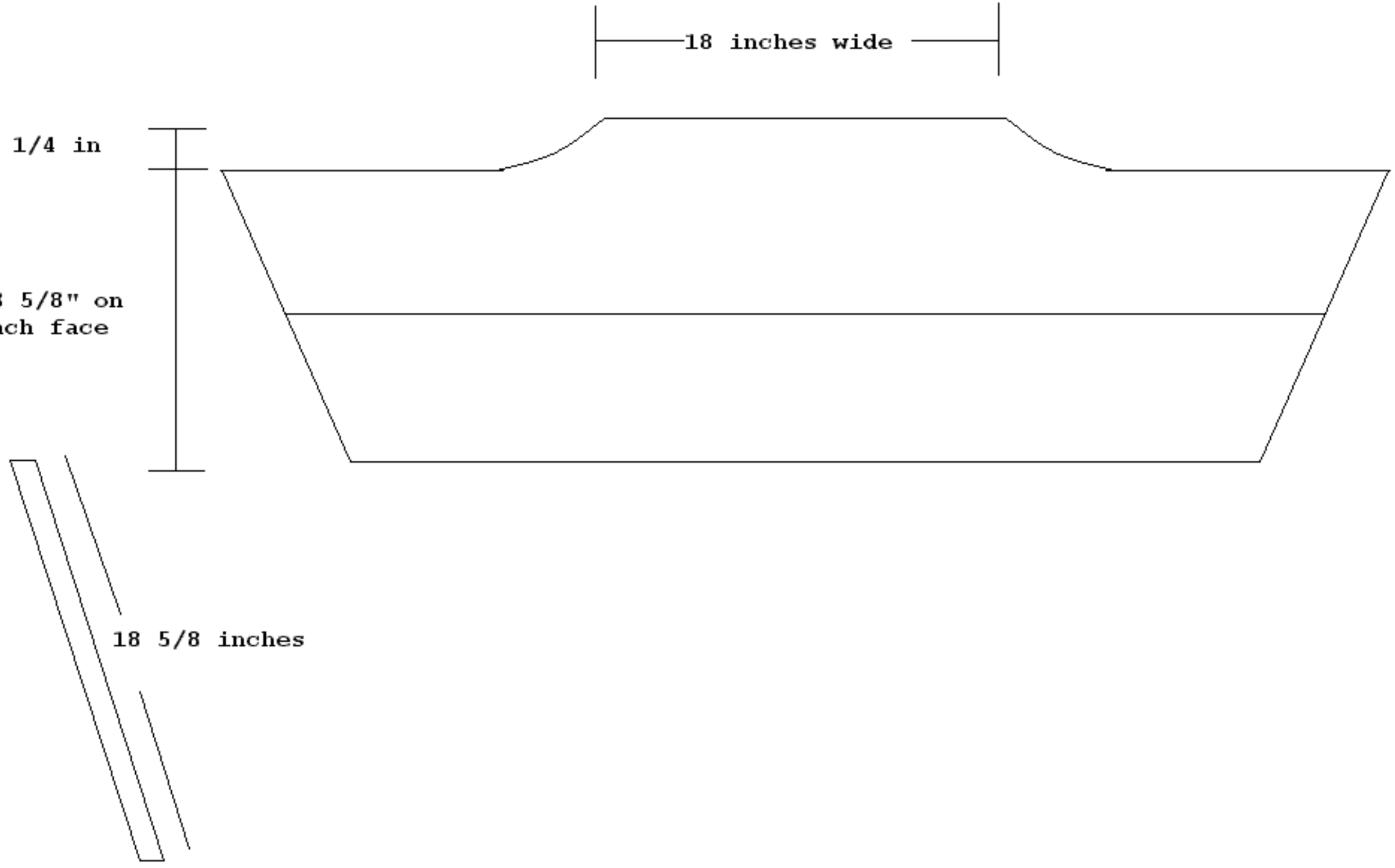
Transom Bevel detail

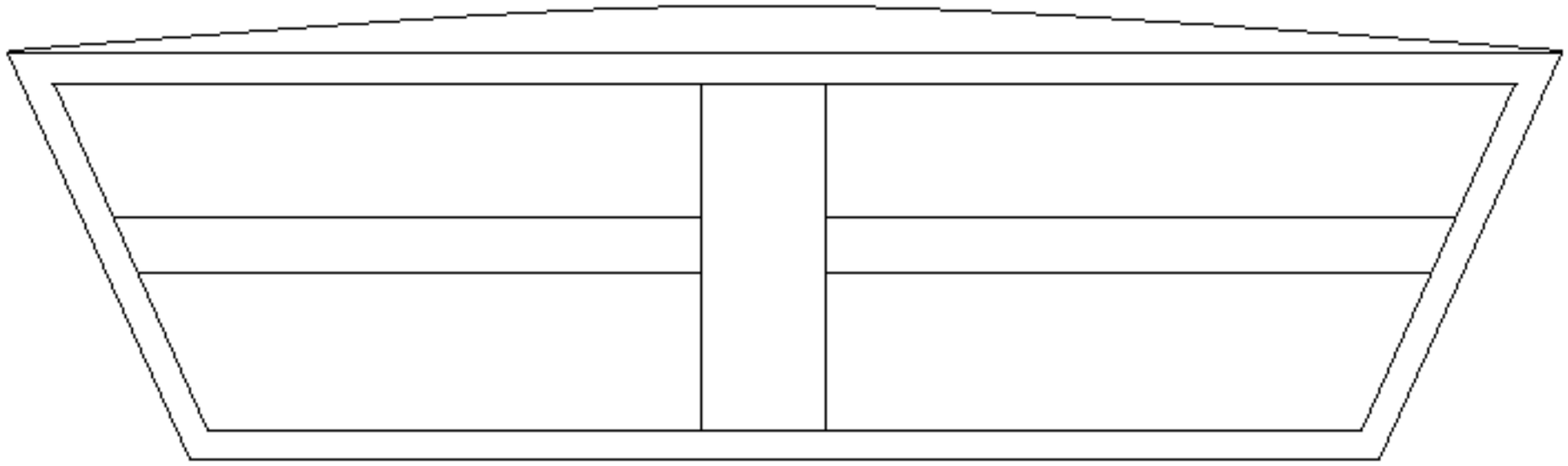


Transom Detail for Short Shaft Motor

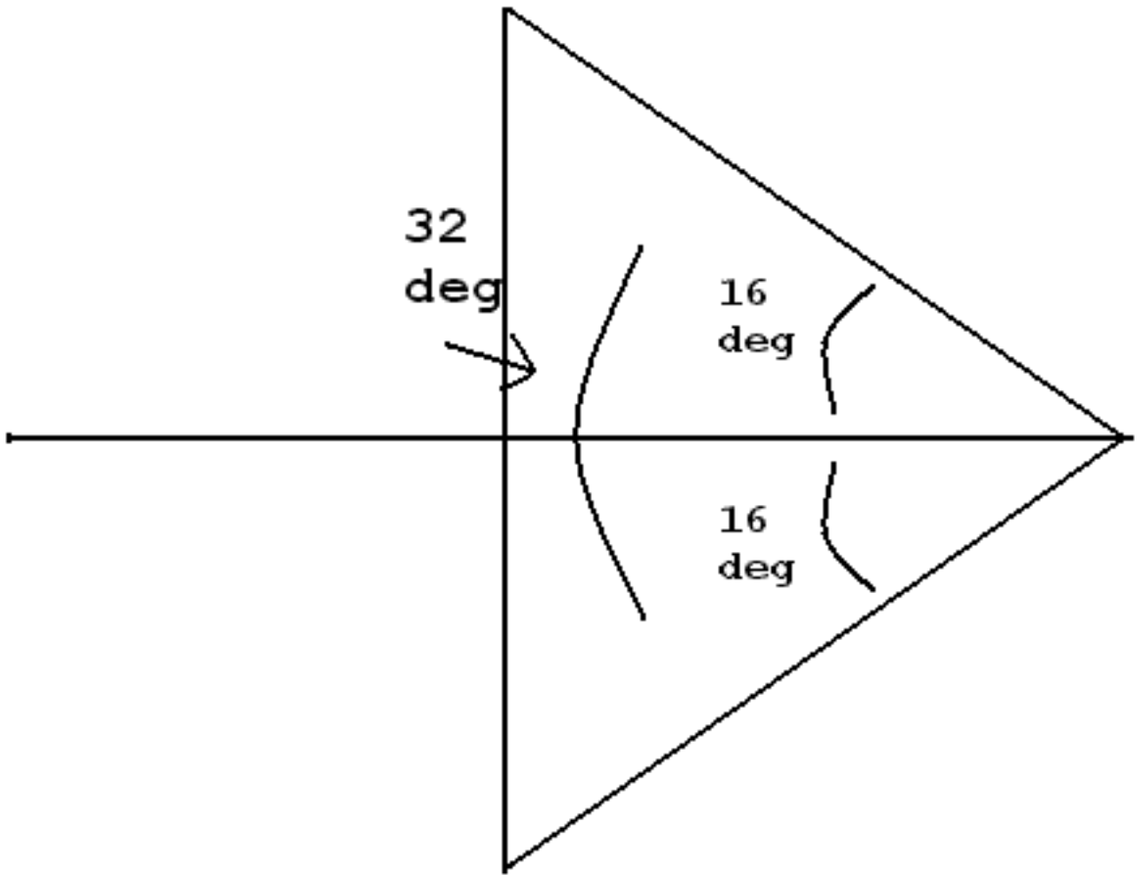


Transom Detail for Long Shaft Motor

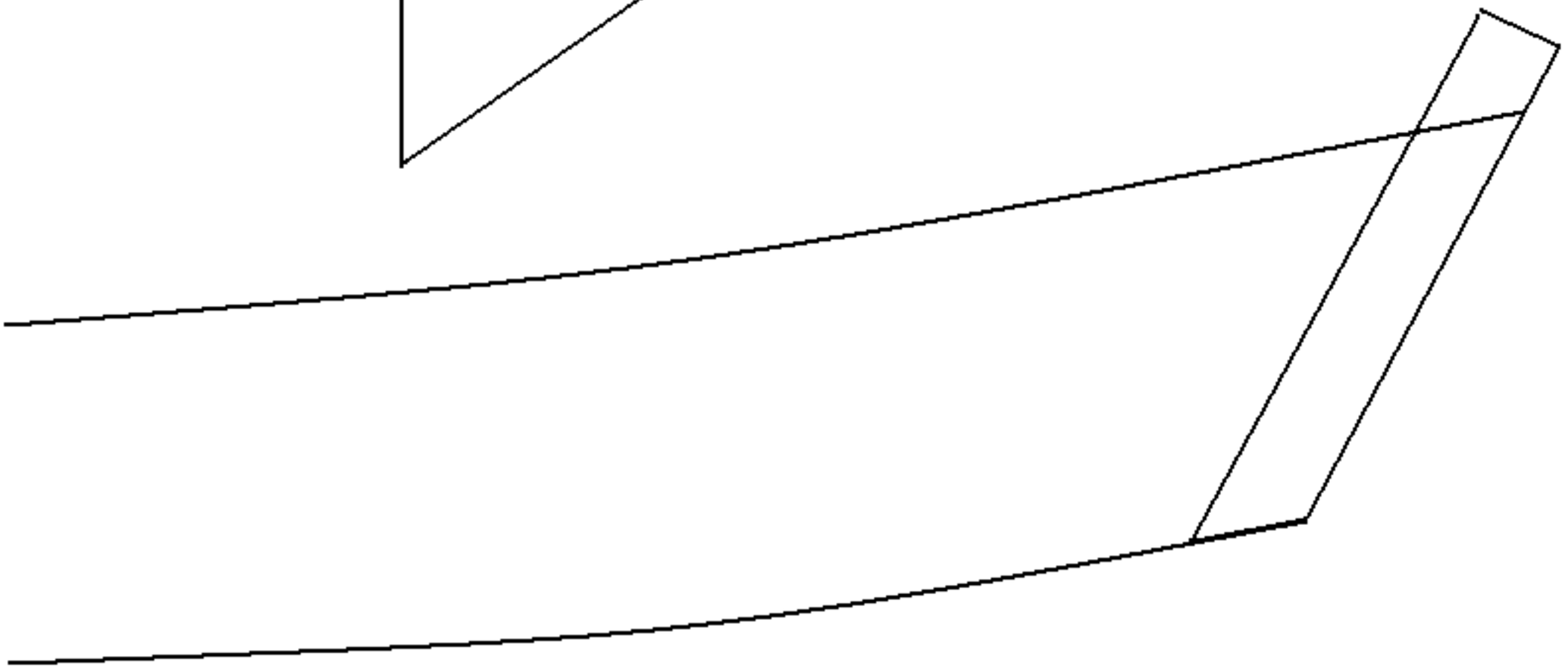


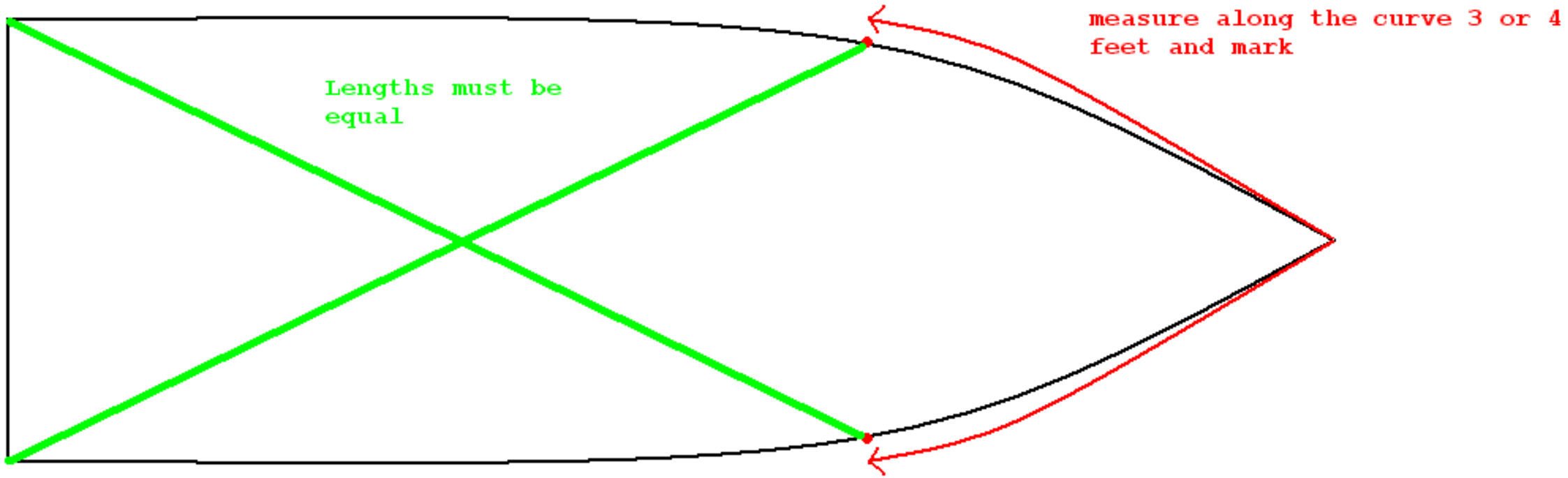


Possible framing. If you think you would want to use a trolling motor, double the thickness of the curved section.



Stem detail...not to scale
for illustration purposes





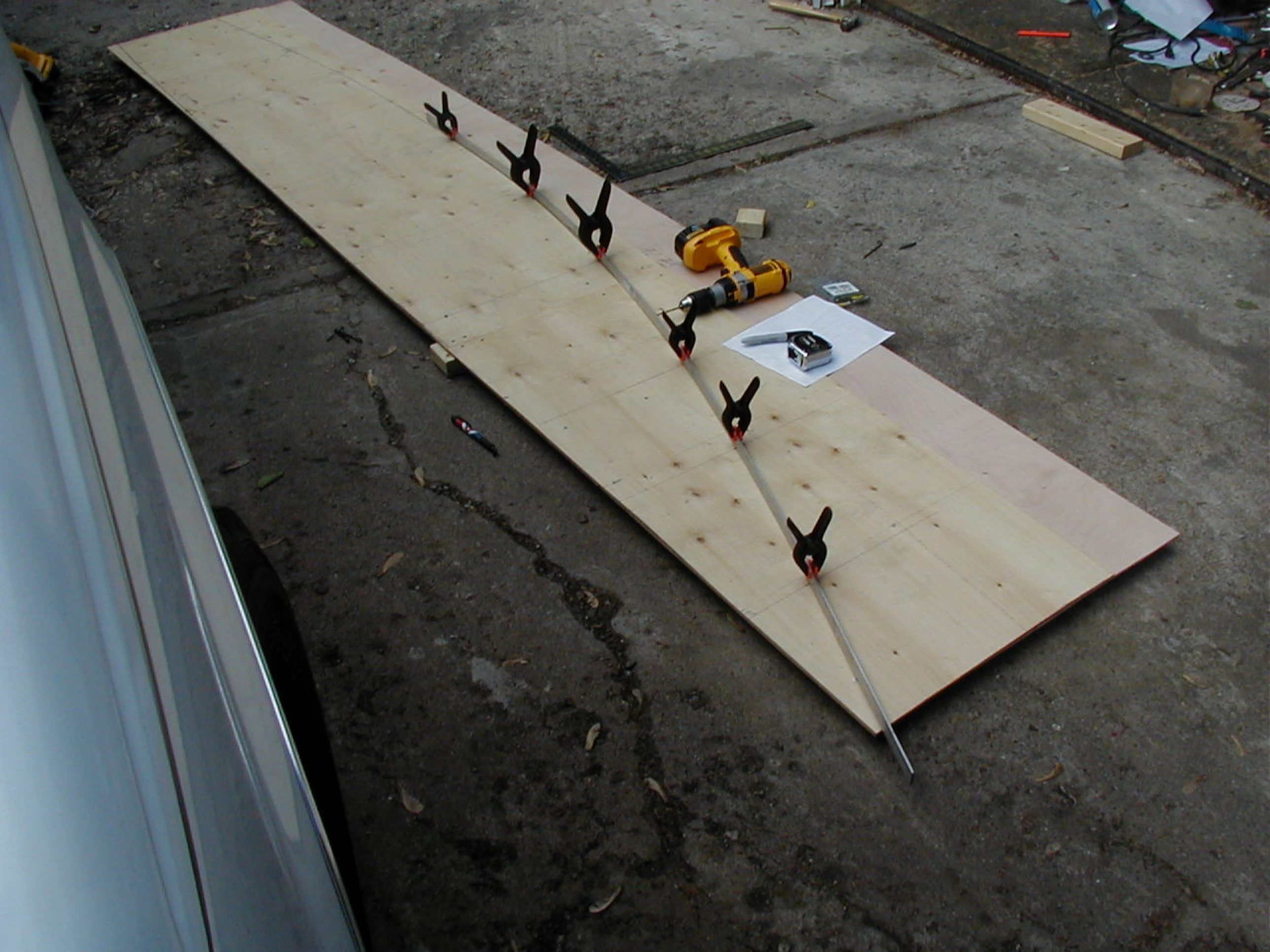
Boat should be flat and level


x
y
x²
y²

x^2 y^2

y x

x y




DEWALT
DEWALT
Pepsi


8692JZ