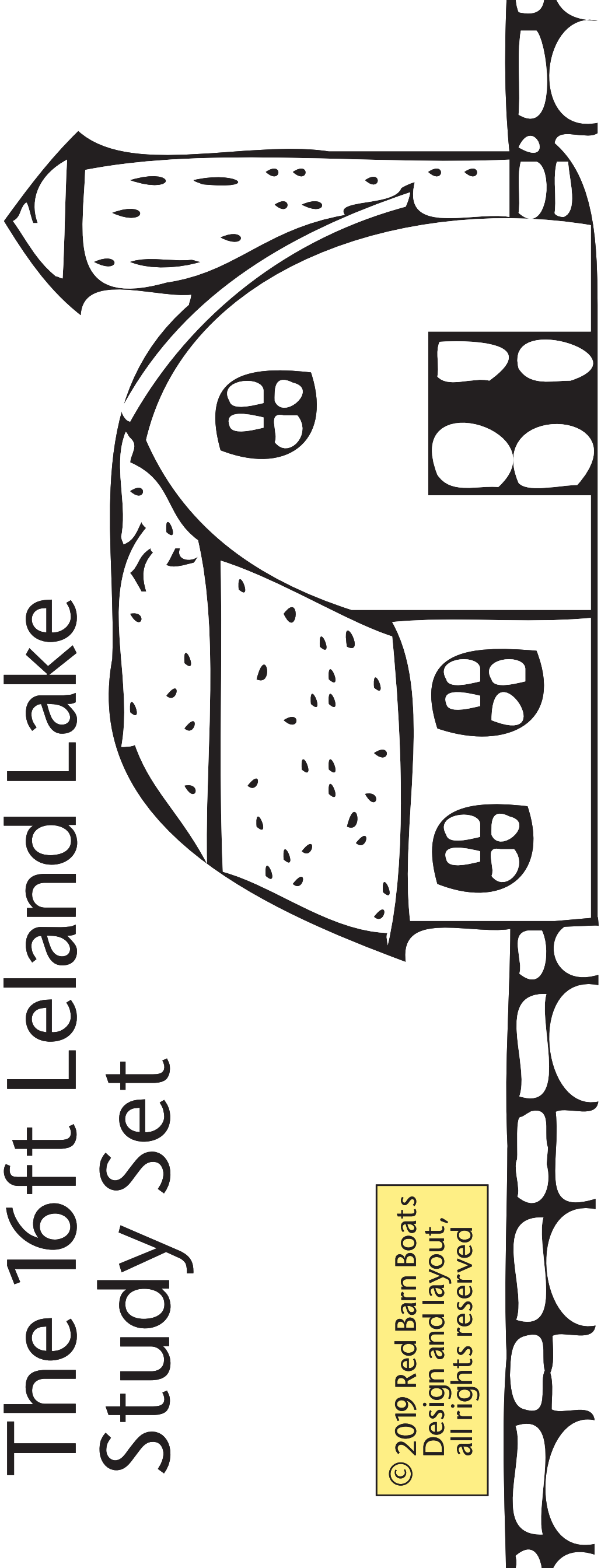


RED BARN BOATS

The 16ft Leland Lake Study Set

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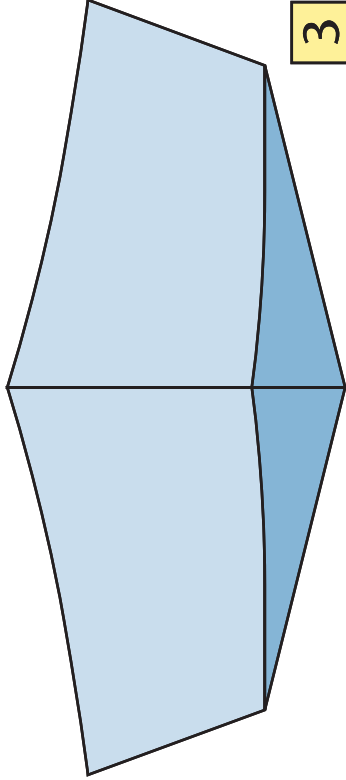
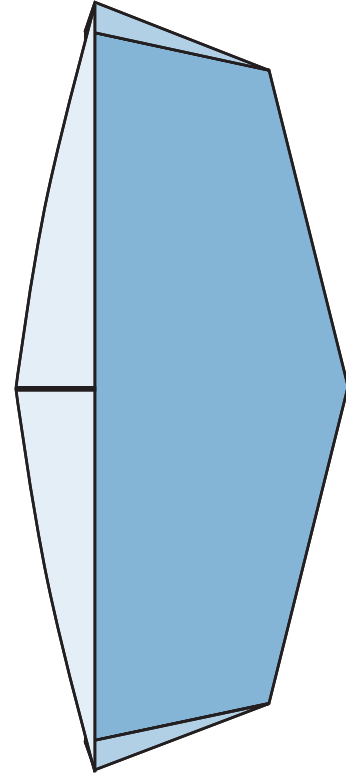
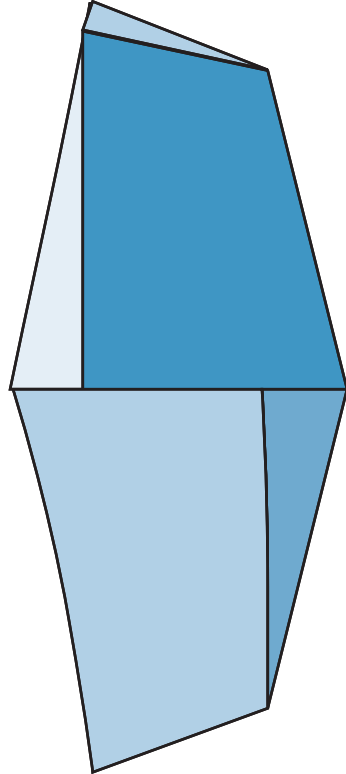
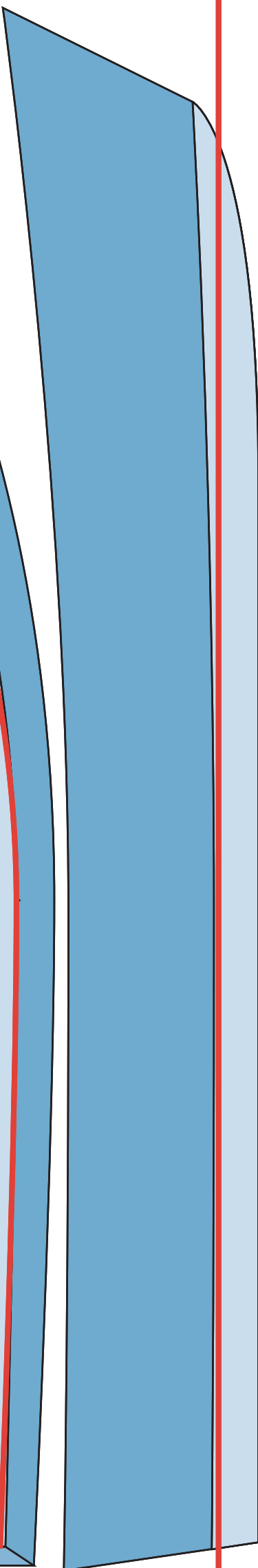
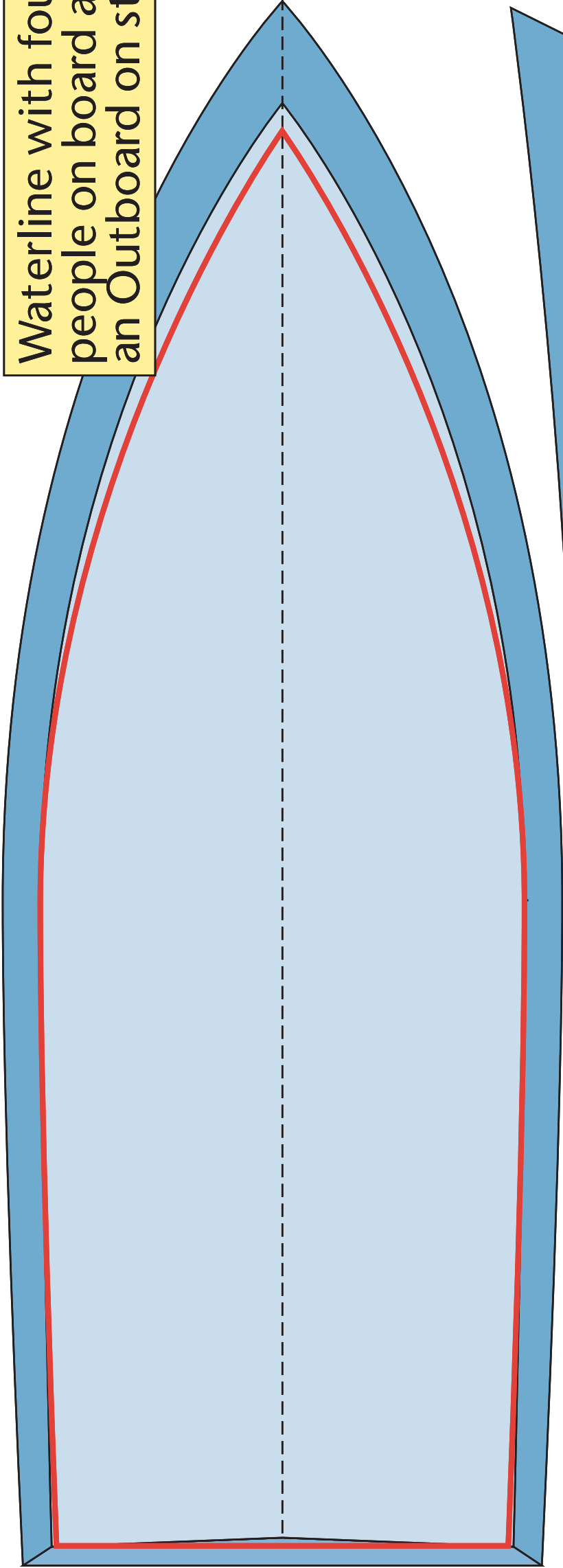
www.youtube.com/redbarnboats

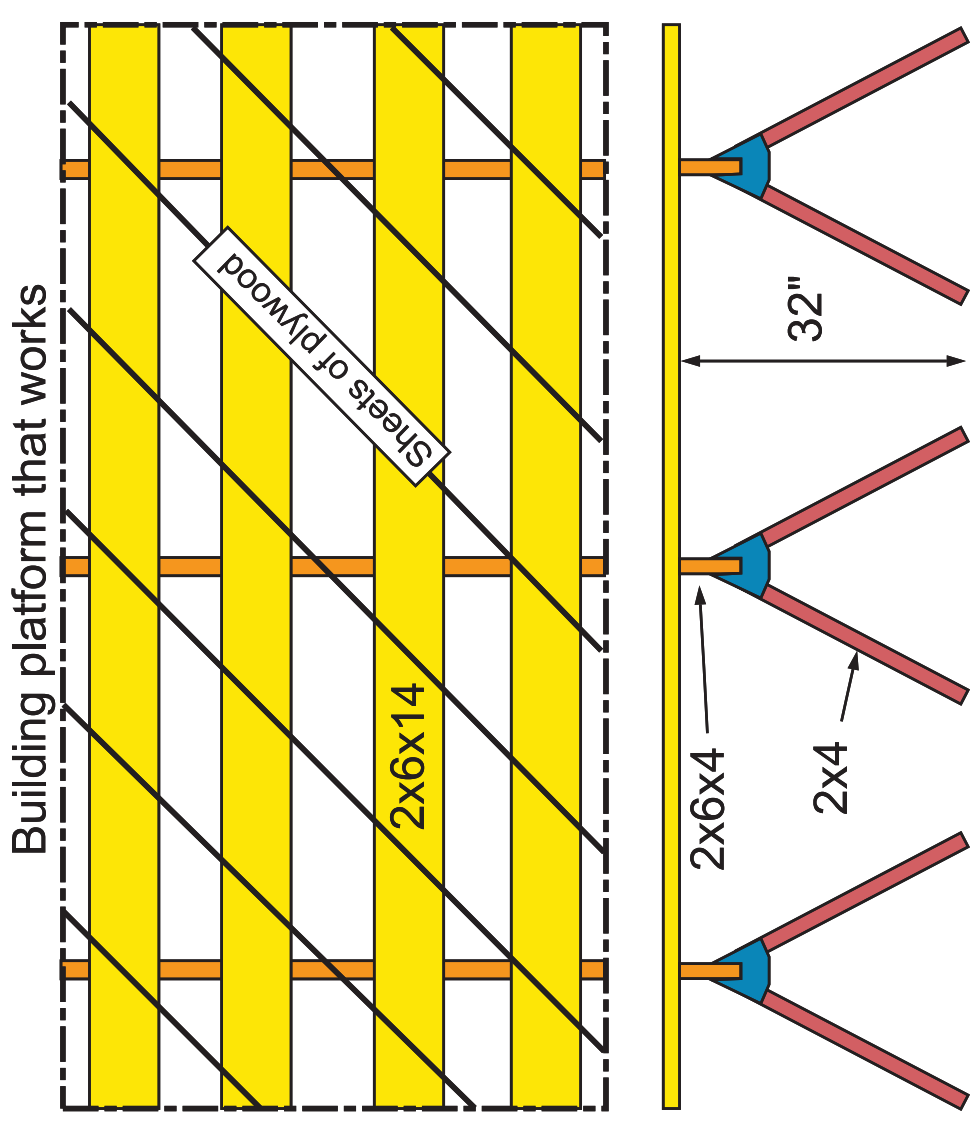
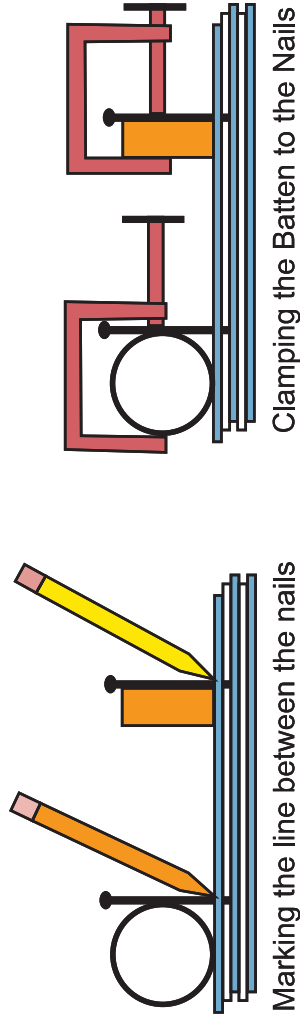
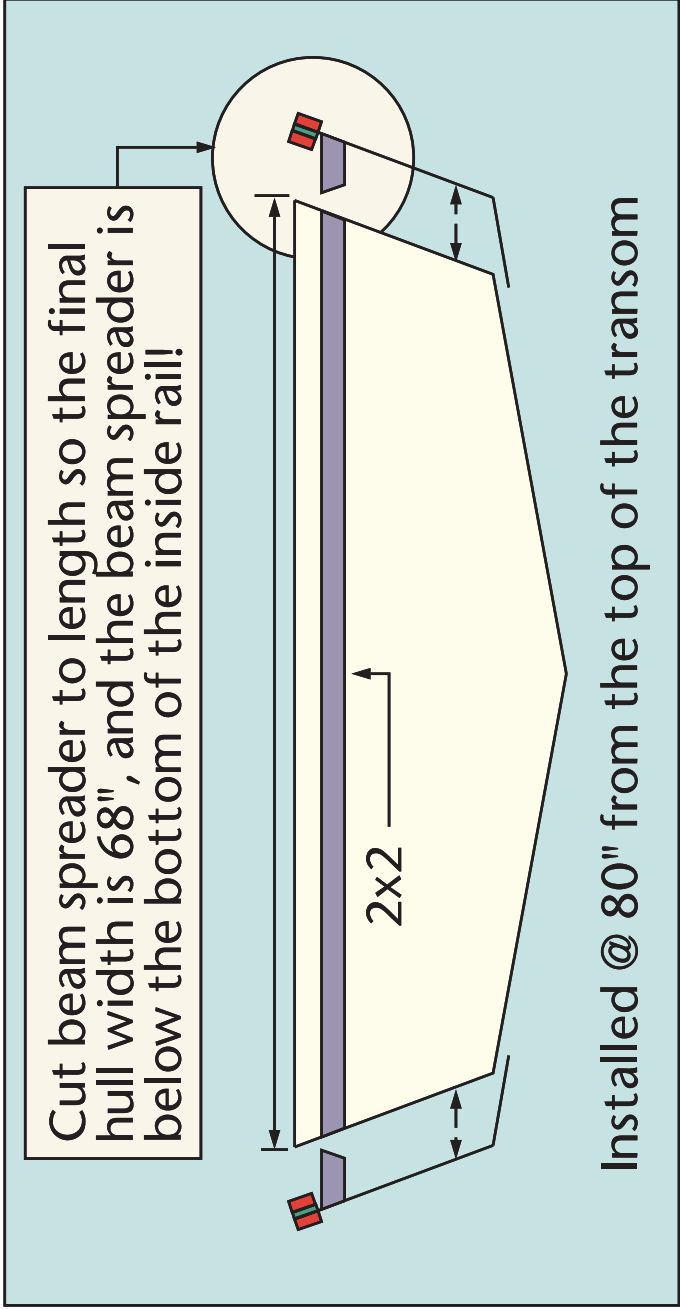


Note: This build set contains several pages from the Reservoir 1525 build set. The lofting page for this hull is for the 16 foot "Leland Lake". The dimensions between the two plan sets are different, but the construction methods are exactly the same for all my hulls. If you have questions, study the other designs for clues on finding the answer to your hull.

For other ideas on different types of interiors, and the details on constructing and fitting them to this hull; download the free "study plan" PDF of the Oahe 1530. Also check out my other designs for more ideas on boat building in my plans section at www.duckworksheets.com. Also visit me at YouTube.com/redbarboats for other how too ideas that may answer your questions!

Waterline with four
people on board and
an Outboard on stern





Ply thickness
plus 1/8"

Outside edges
beveled to centerline

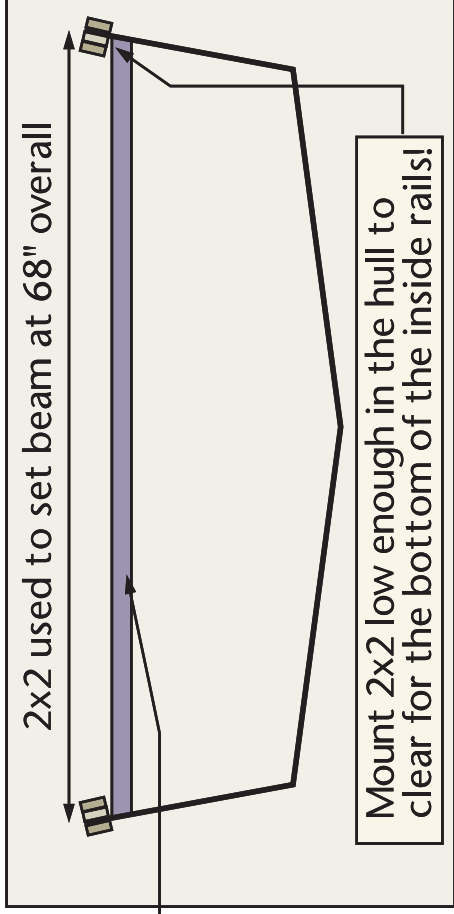


Keel seam

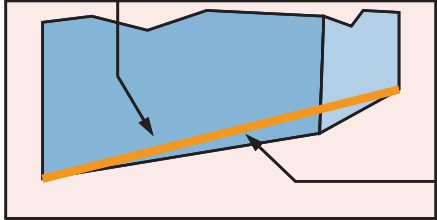
Side to Bottom
chine seam

See page #15 for details on adding the "station line cut marks" when you loft and cutout the panels!

Install the 2x2 after the hull is wired up!
Keep it there until the rails are in/the seats are installed

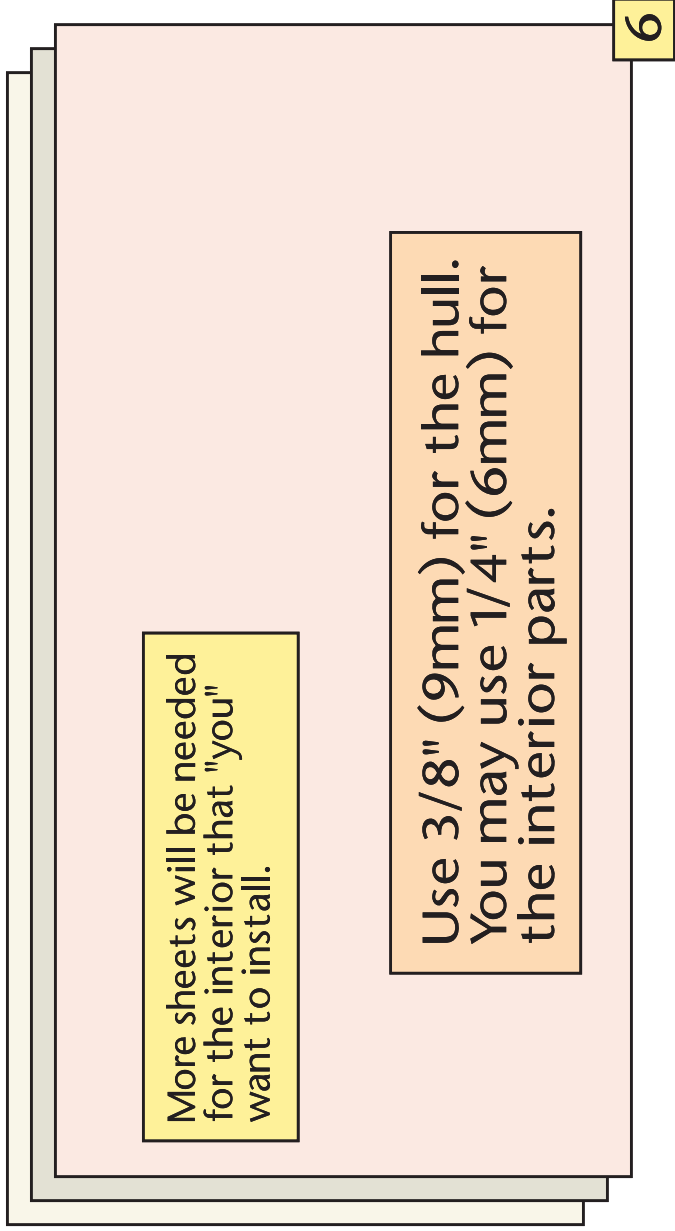
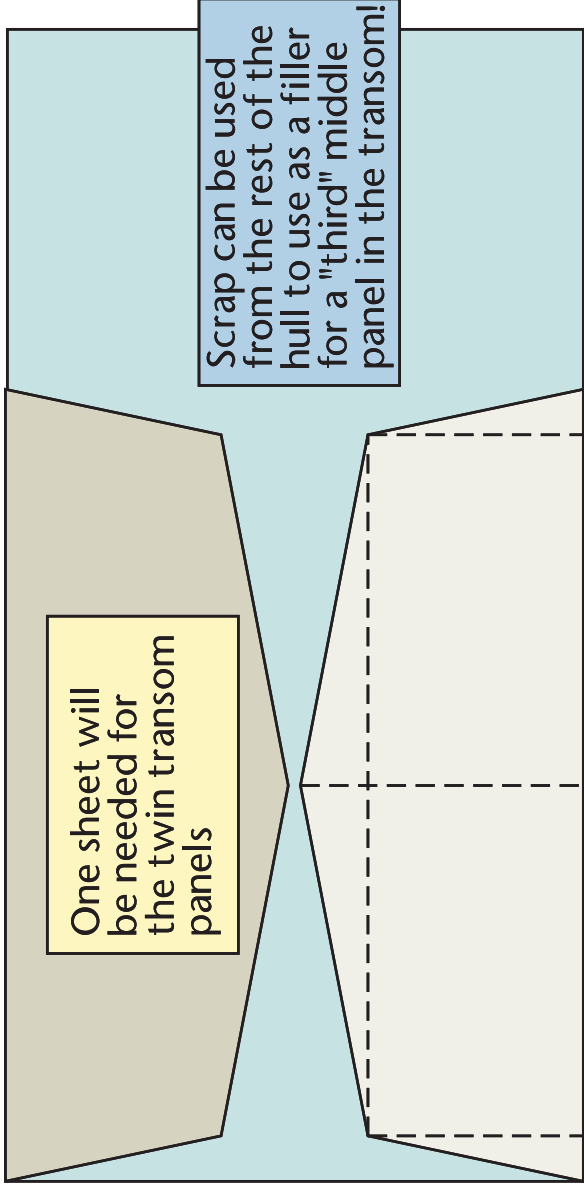
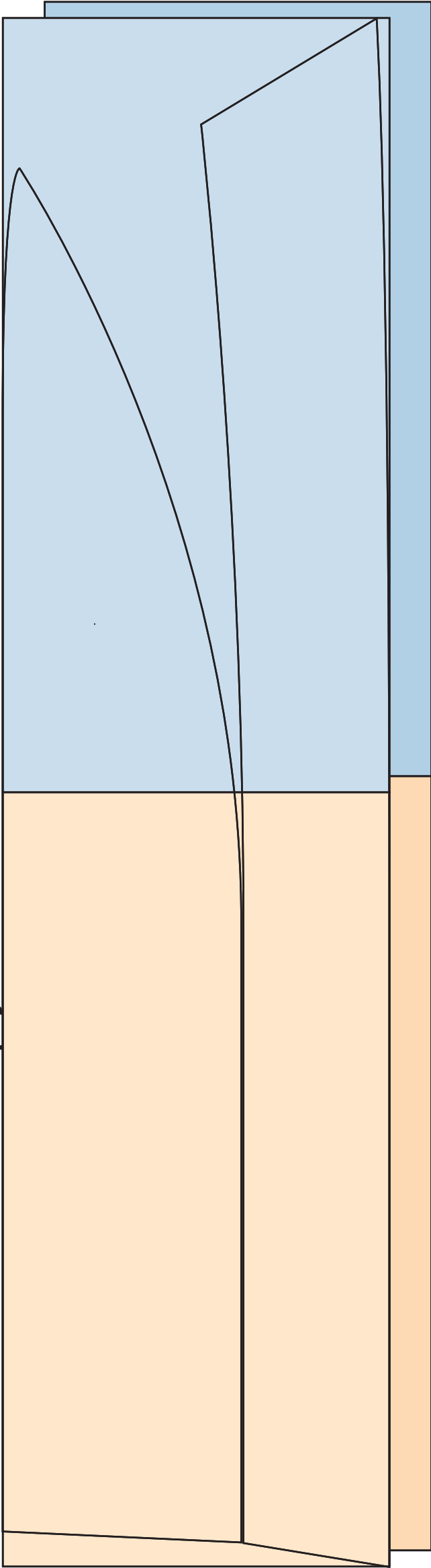


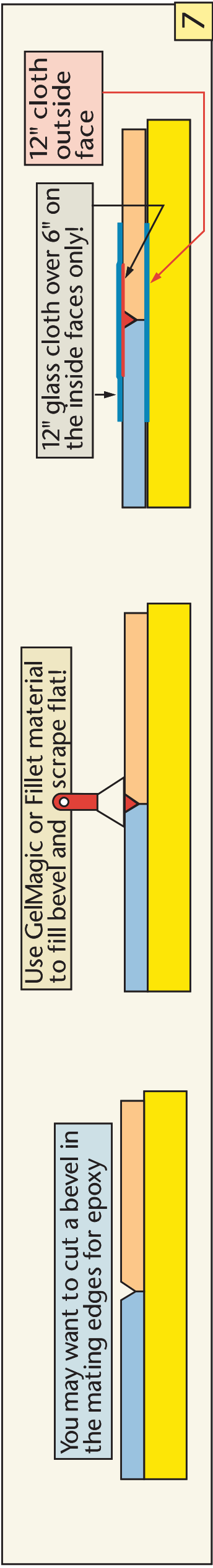
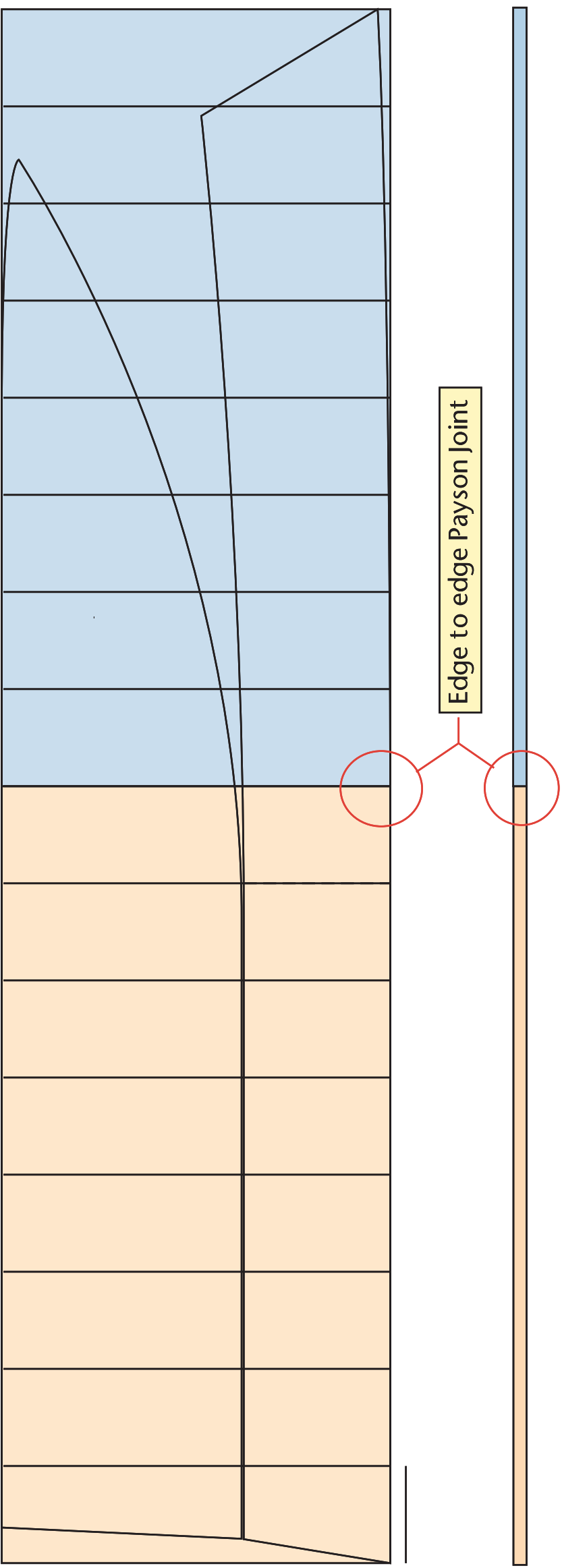
Note: If the panels ends don't quite match up, it is ok to install the transom in the hull, jump stitch, fillet, and glass tape the inside seams. Then when you flip the hull to work on the bottom, you can "trim" the panels flush with the outside face of the transom!

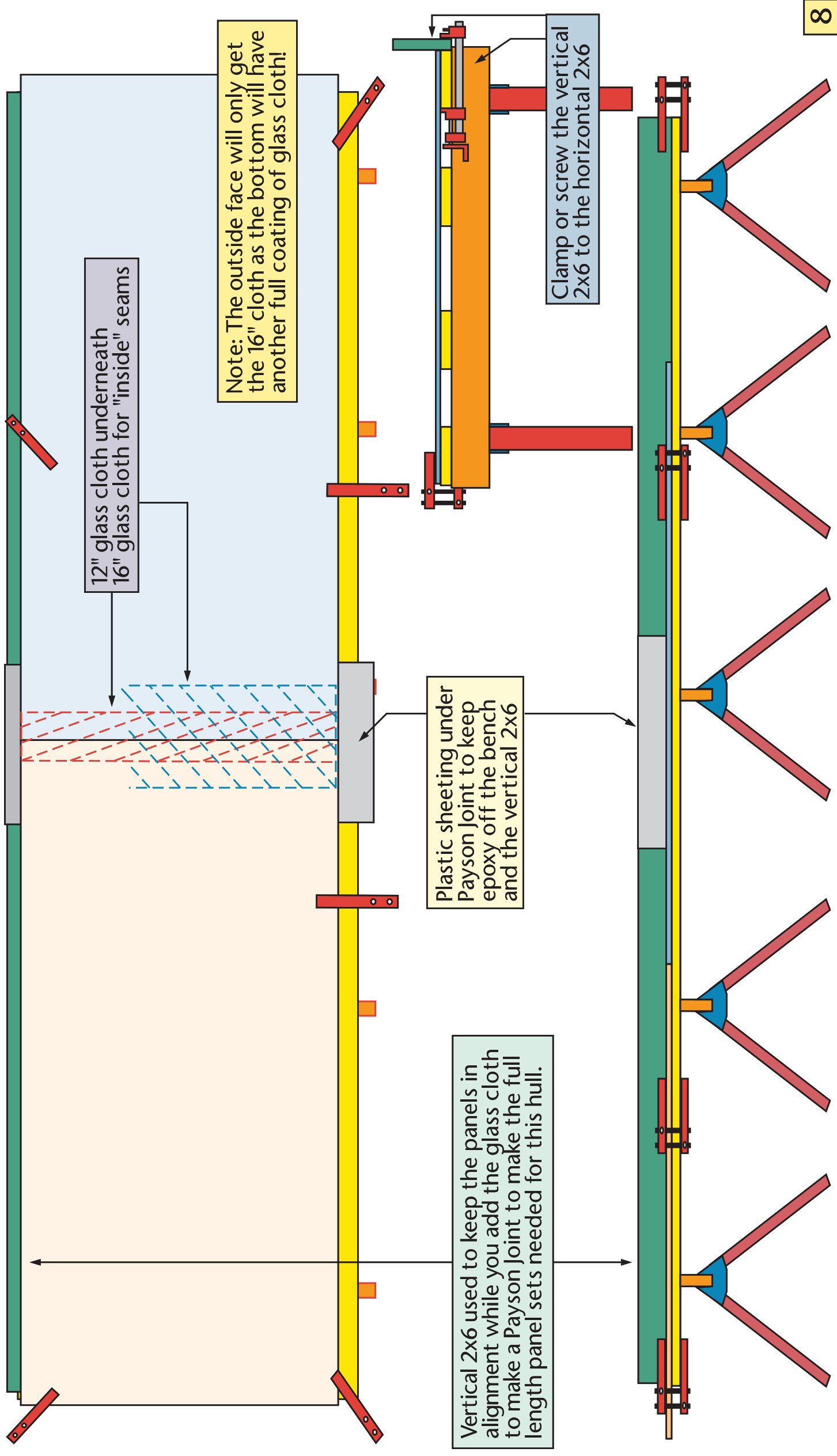


Transom panel

Two sets of plywood will be needed for the hull!







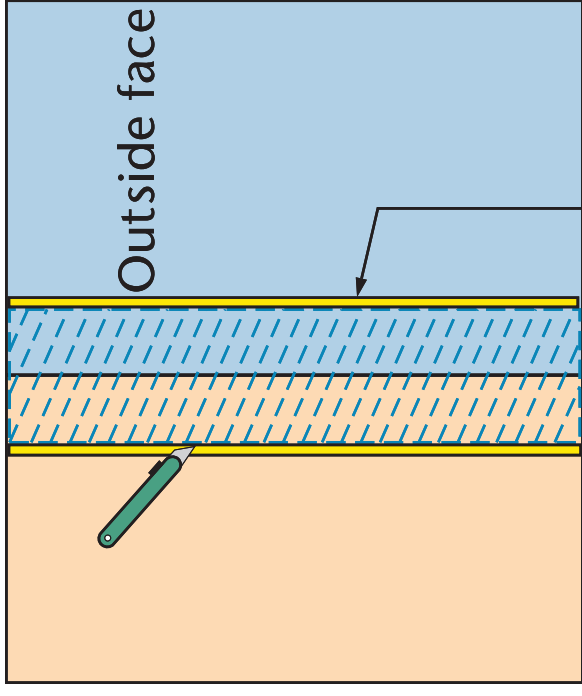
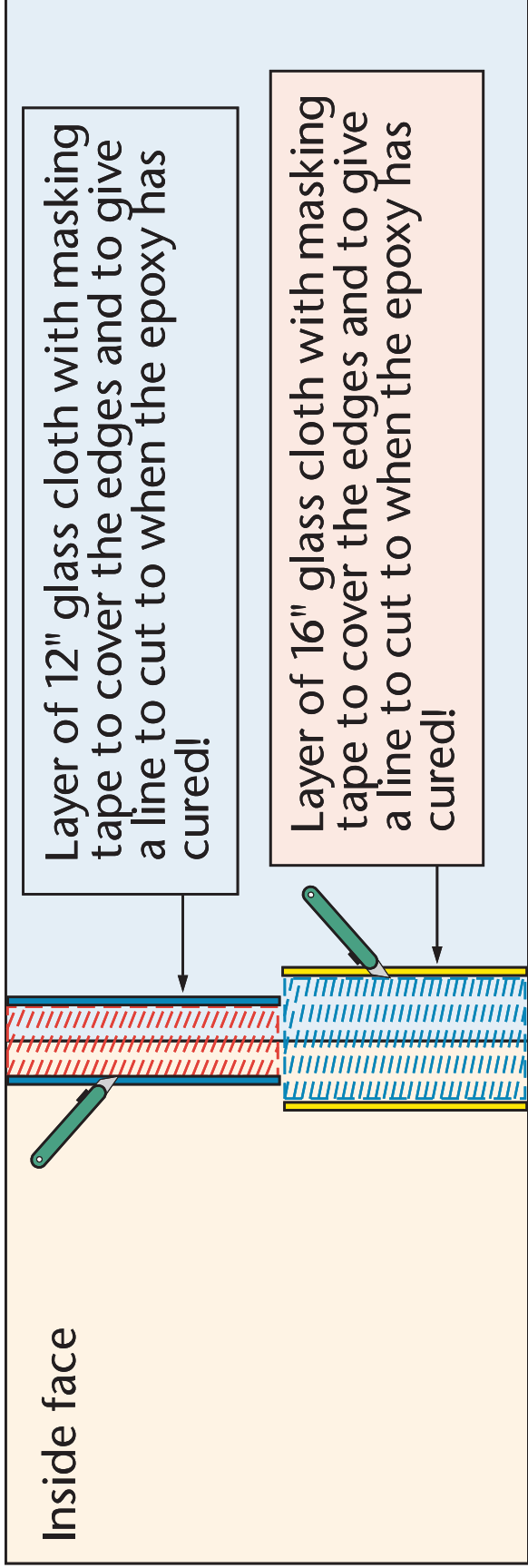
12" glass cloth underneath
16" glass cloth for "inside" seams

Note: The outside face will only get
the 16" cloth as the bottom will have
another full coating of glass cloth!

Plastic sheeting under
Payson joint to keep
epoxy off the bench
and the vertical 2x6

Vertical 2x6 used to keep the panels in
alignment while you add the glass cloth
to make a Payson joint to make the full
length panel sets needed for this hull.

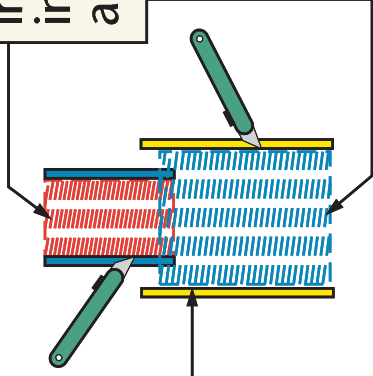
Clamp or screw the vertical
2x6 to the horizontal 2x6



Single layer of glass cloth on outside faces only!

Cut to "inside edge" of masking tape after a full cure or when the epoxy has gone "green" (tacky) and peel off

Install a dual layer of glass cloth on the inside seams. First a layer of 12" wide cloth and then a layer of 16" wide cloth.

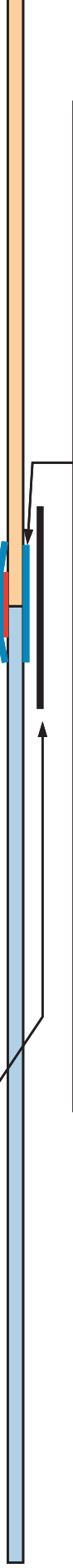


Note: Remember to cover work platform with plastic to keep the panels from bonding to it!

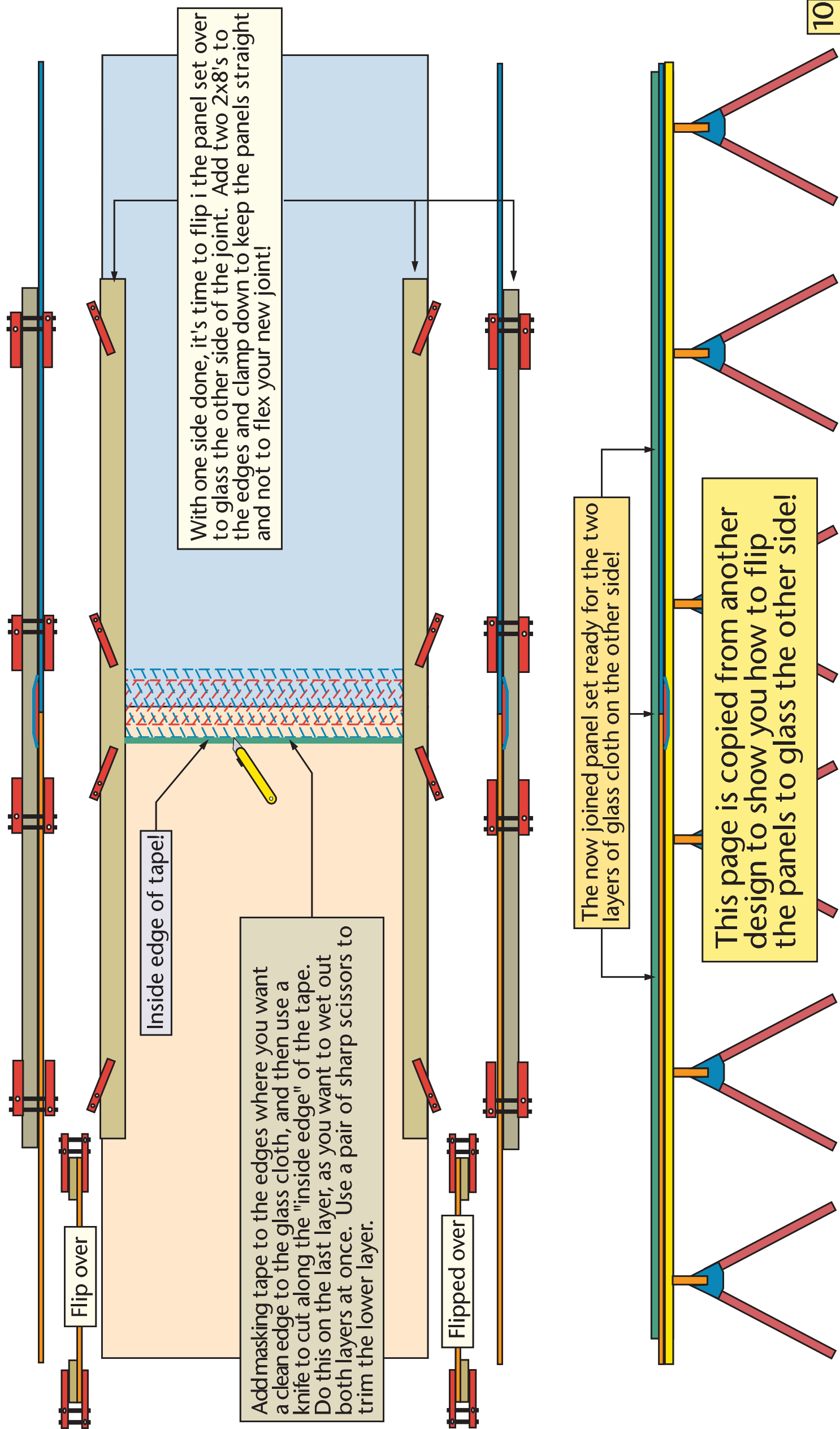
Inside of panel faces!

Apply a thick bead of epoxy or GelMagic between the panels

The diagram shows a cross-section of the inside of the panel faces. A green pencil is shown applying a thick bead of epoxy or GelMagic (red) between the panels. The epoxy is applied to the inside of the panel faces.



Single layer of 16" glass cloth on outside panel faces!



Flip over

Flipped over

Inside edge of tape!

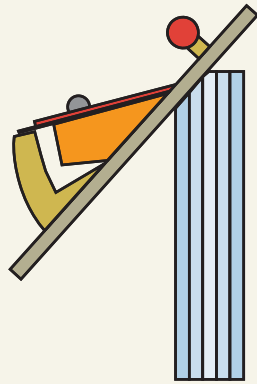
With one side done, it's time to flip i the panel set over to glass the other side of the joint. Add two 2x8's to the edges and clamp down to keep the panels straight and not to flex your new joint!

Add masking tape to the edges where you want a clean edge to the glass cloth, and then use a knife to cut along the "inside edge" of the tape. Do this on the last layer, as you want to wet out both layers at once. Use a pair of sharp scissors to trim the lower layer.

The now joined panel set ready for the two layers of glass cloth on the other side!

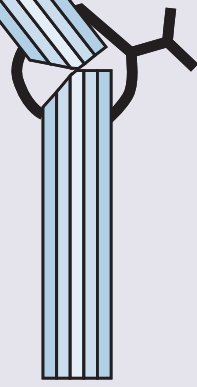
This page is copied from another design to show you how to flip the panels to glass the other side!

Two sets of lengthened plywood for the two bottom panels and the two side panels on this hull. The transom panels will come out of another sheet of plywood.

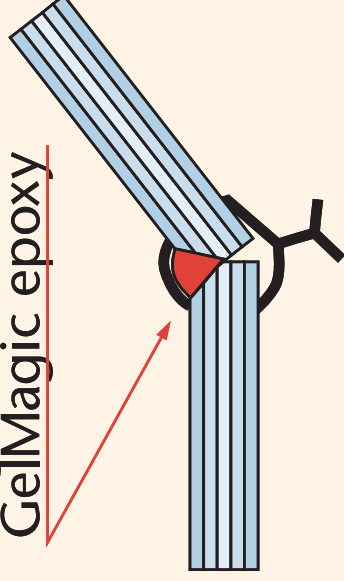


Five ply 9mm plywood beveled to center of edge

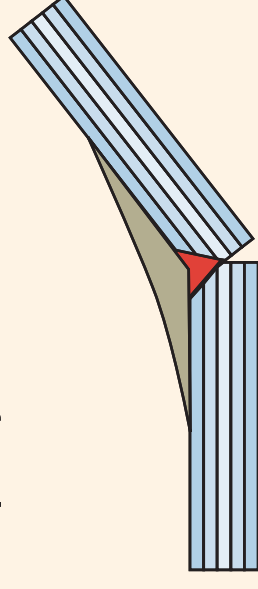
Panels wired together

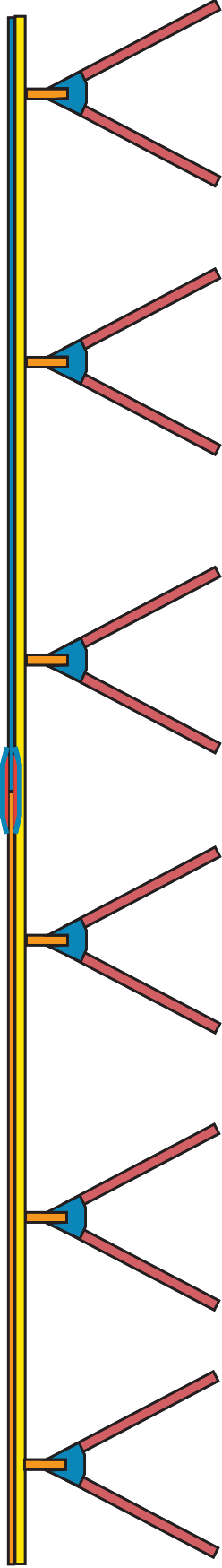
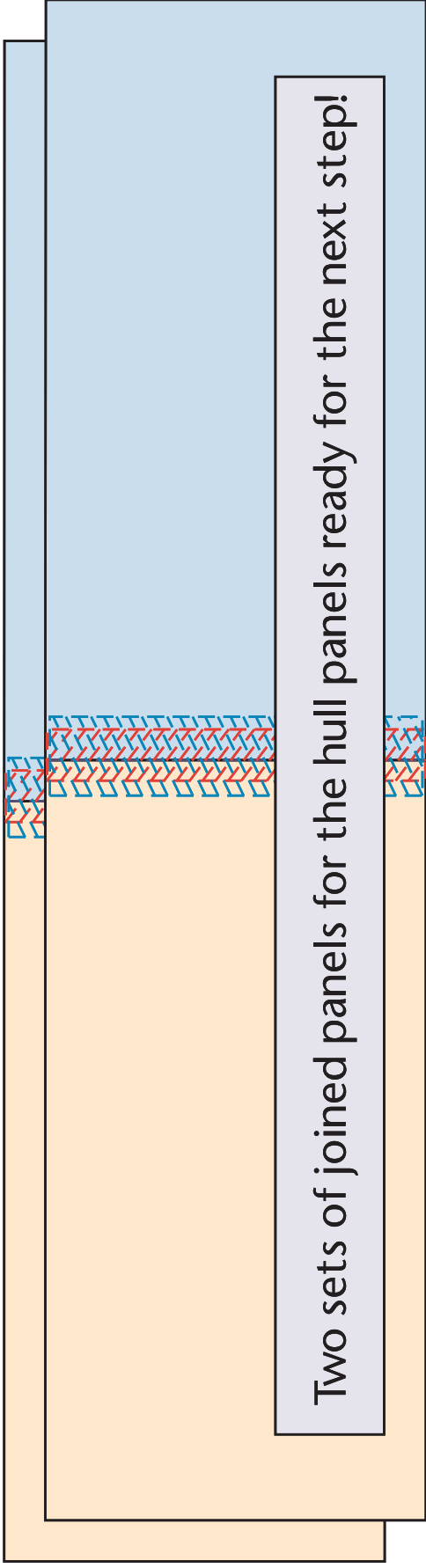


Panels jump stitched together with GelMagic epoxy

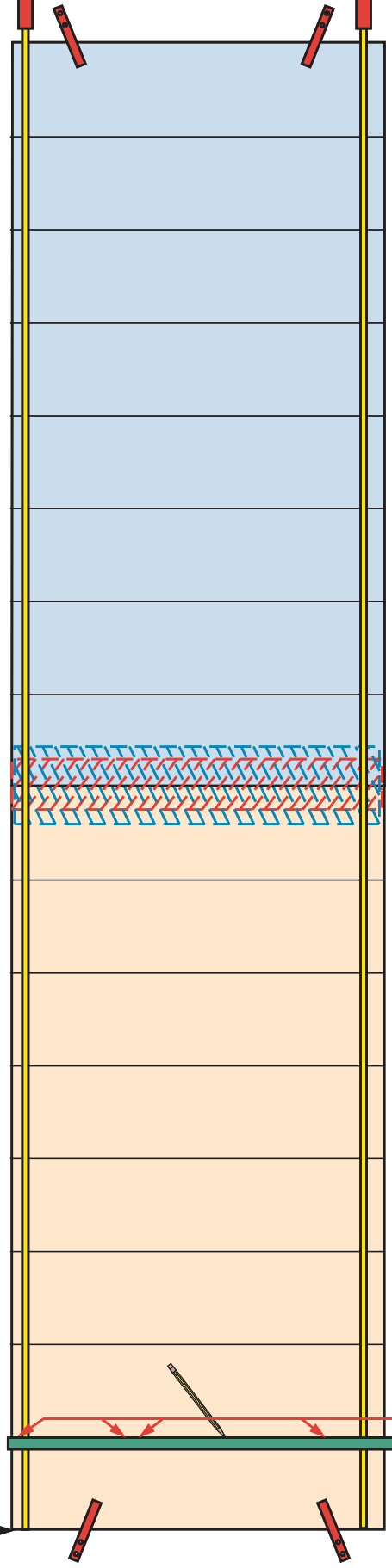


Panels with epoxy fillets



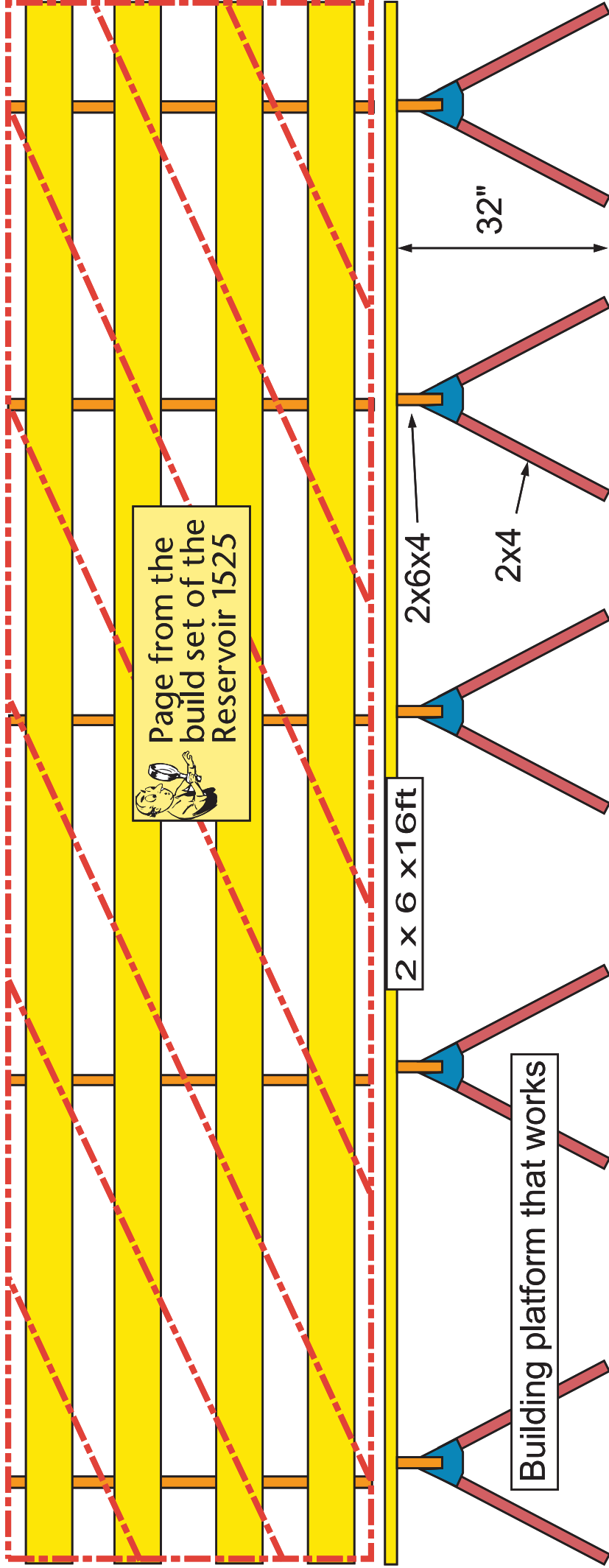
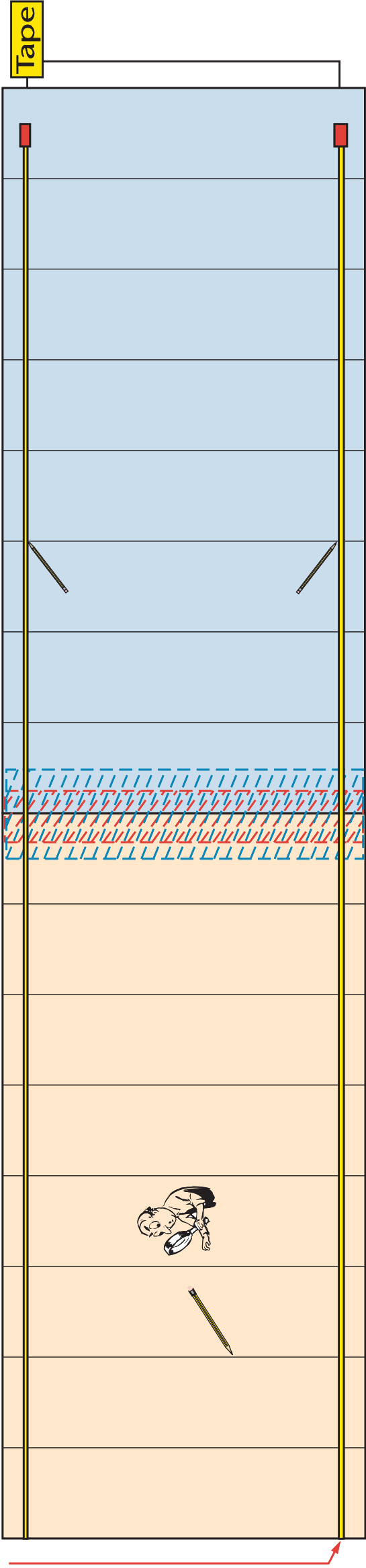


Station lines marked at one foot intervals starting at the lefthand end!



The two panel sets clamped together for laying out the grid for lofting

Use a good quality 4-5ft rule to locate the station grid lines.



Page from the
build set of the
Reservoir 1525

2 x 6 x 16ft

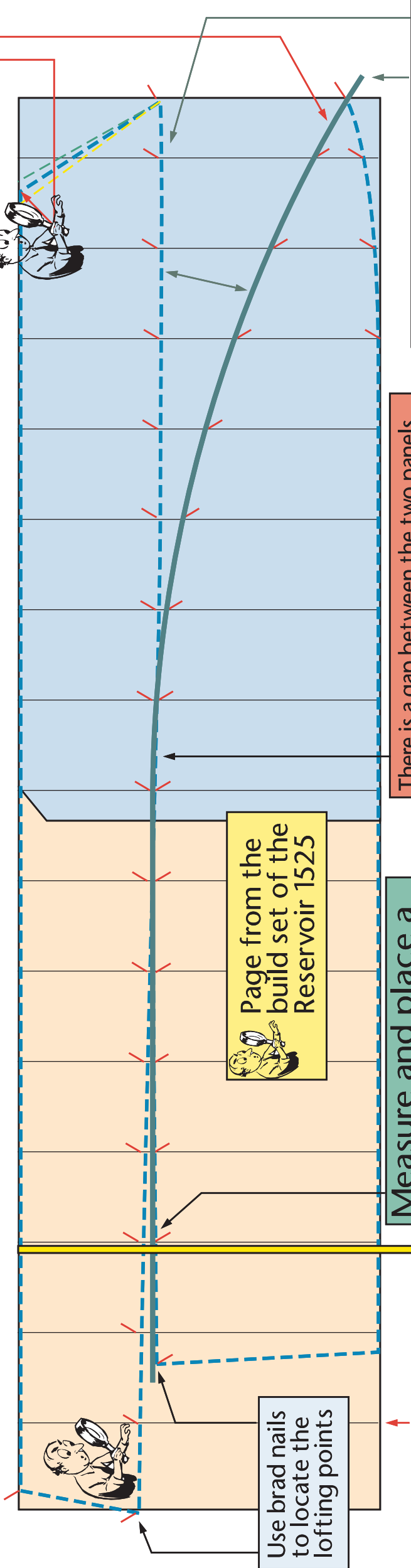
2x6x4

2x4

32"

Building platform that works

To Do, To Do, To Do: Measure the "arc lengths" of the two mating curves of the side and bottom panels! The top panel should be 1/4" longer! adjust the lower bow corner in or out to get this extra 1/4"



Page from the build set of the Reservoir 1525

Use brad nails to locate the lofting points

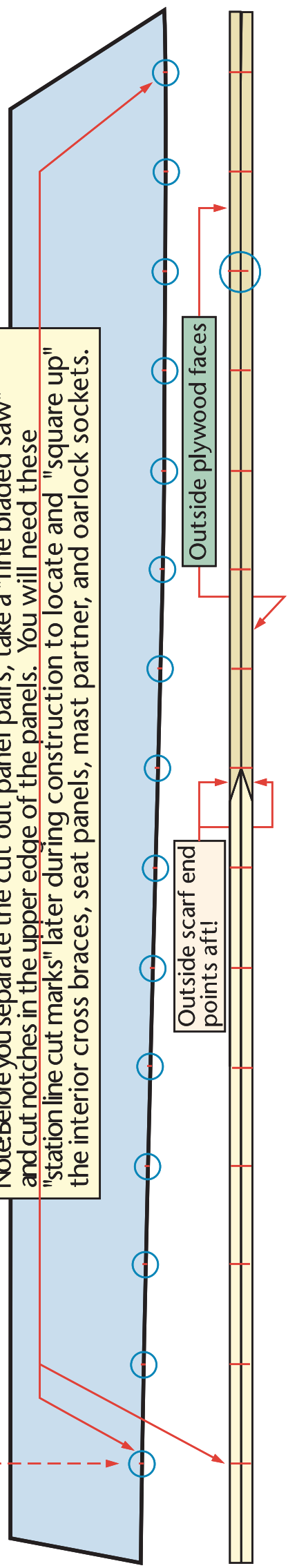
Measure and place a brad nail at that spot

Measuring the "arc length" is important for any hull you build. Be sure to follow the instructions on this page!

There is a gap between the two panels, but not much. Be careful when you cut out the two panels!

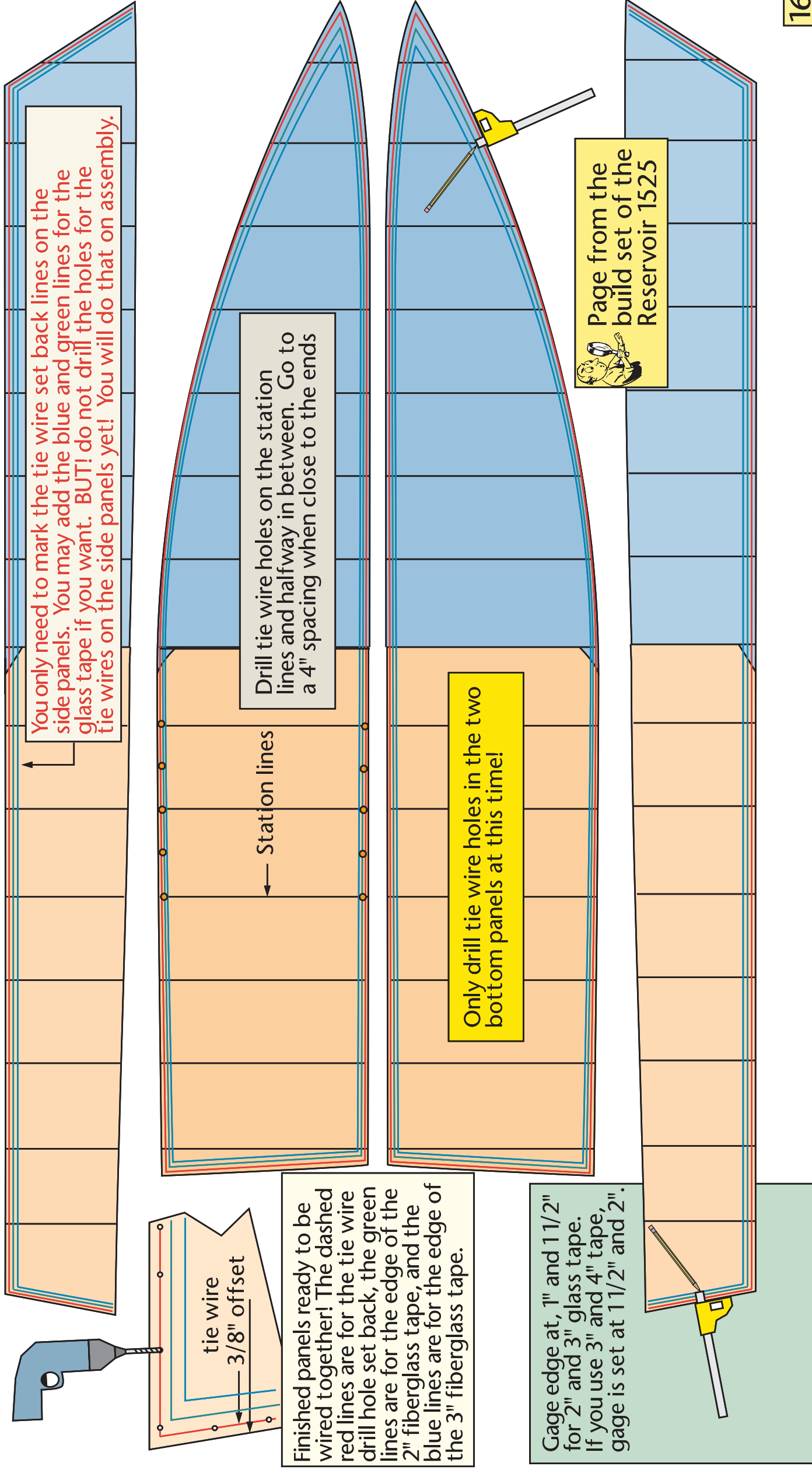
Use a flexible batten to "fair in" the lofted arc along the brad nails along the outside of the bottom panel, and the forward end of the top of the bow panel!

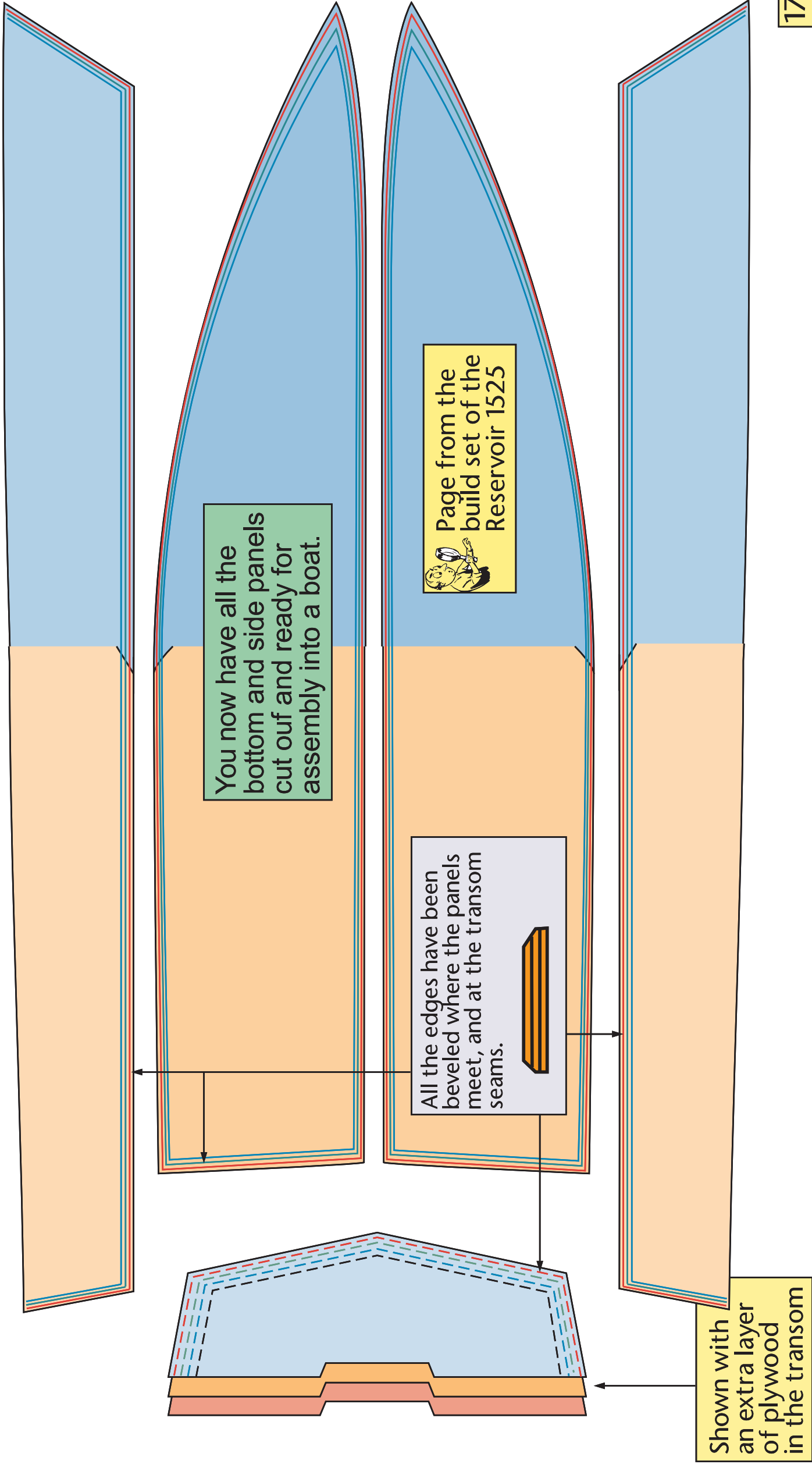
Note: Before you separate the cut out panel pairs, take a "fine bladed saw" and cut notches in the upper edge of the panels. You will need these "station line cut marks" later during construction to locate and "square up" the interior cross braces, seat panels, mast partner, and oarlock sockets.

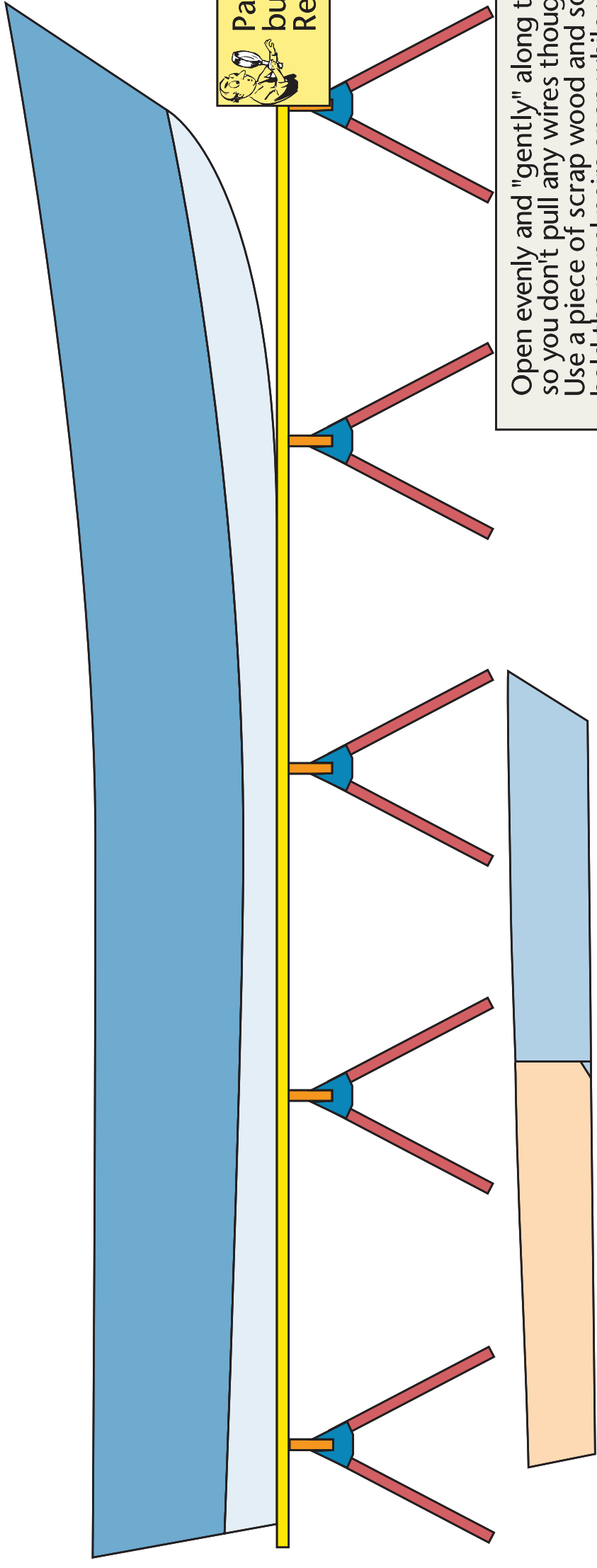


Outside scarf end points aft!

Outside plywood faces

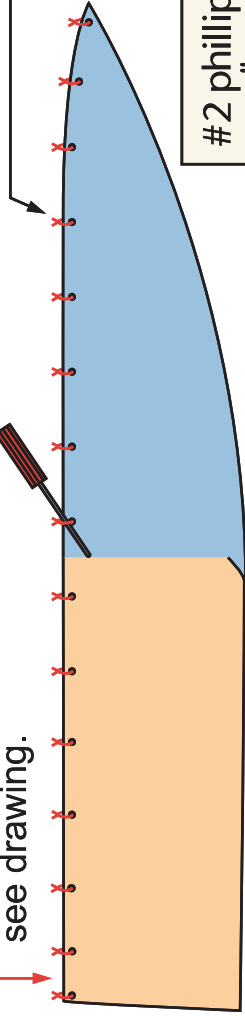






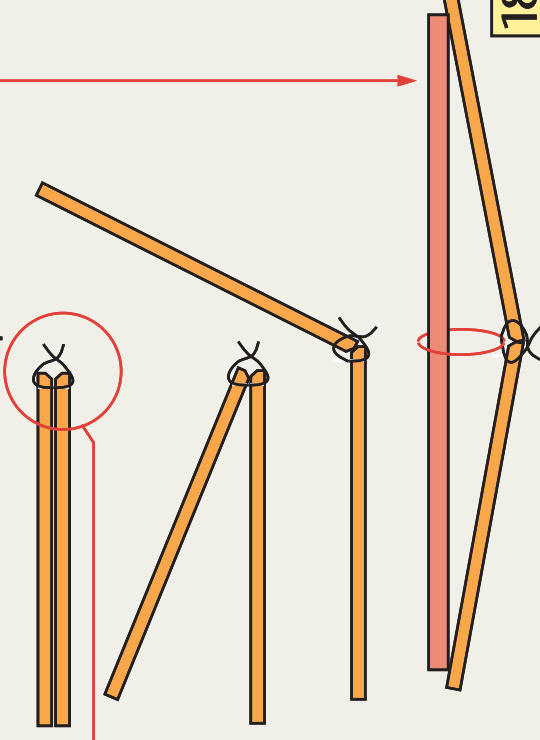
Page from the
build set of the
Reservoir 1525

Re-layer the bottom panels so that the sides with the bevels on the edges are facing each other. Place a tie wire at each of the station lines. Use a #2 phillips screwdriver to tighten the wires too, so you have room. see drawing.



#2 phillips screwdriver used as a "gage" for tightening the wire and leaving a gap

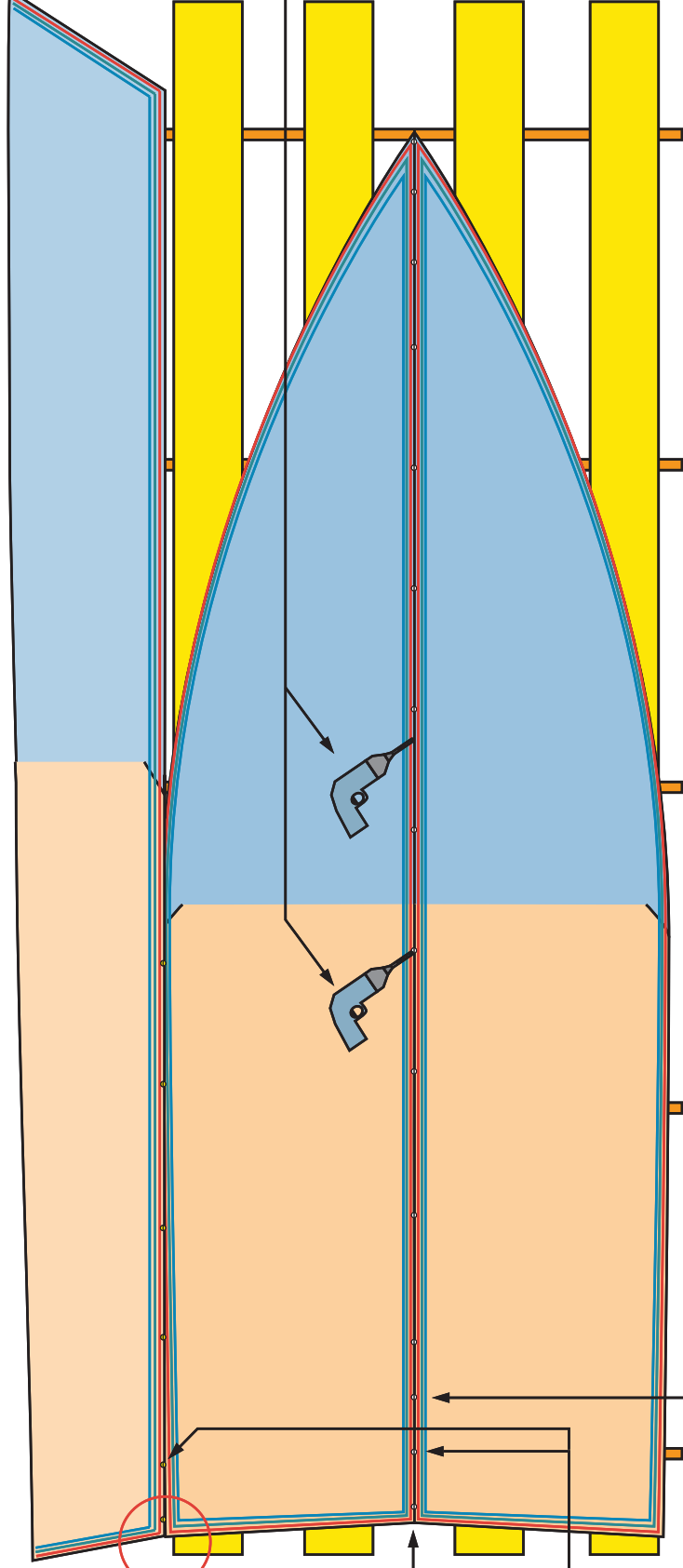
Open evenly and "gently" along the wired seam so you don't pull any wires through the holes. Use a piece of scrap wood and some cord to hold the panel pairs open while you add the two side panels and the transom panel.





Page from the
build set of the
Reservoir 1525

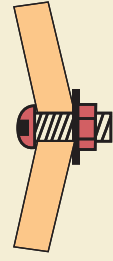
It's nice to have two electric
drills and bits, one sized for
the 1/4" bolts and one sized
for the tie wire!



Bottom stern
edges of the
panels lined up!

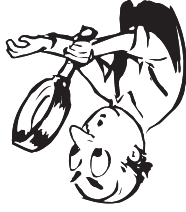
Wires and Bolts
to tie the panels
together and hold
them on edge

Bolts and nuts are
"not tight" just
snug for now so
the panels can still
move around a bit

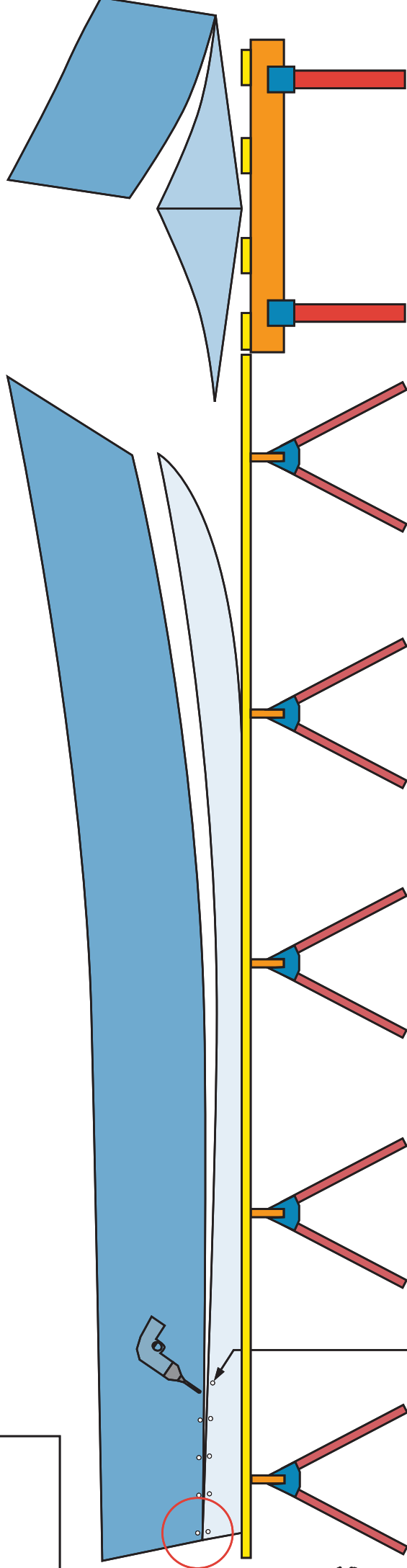


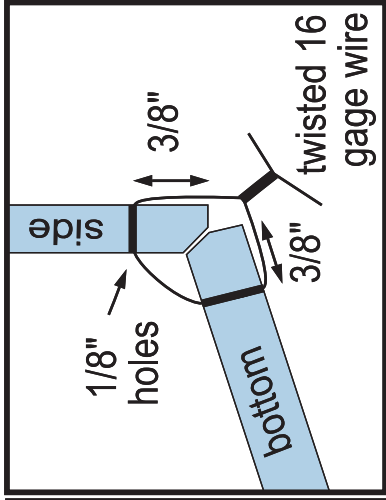
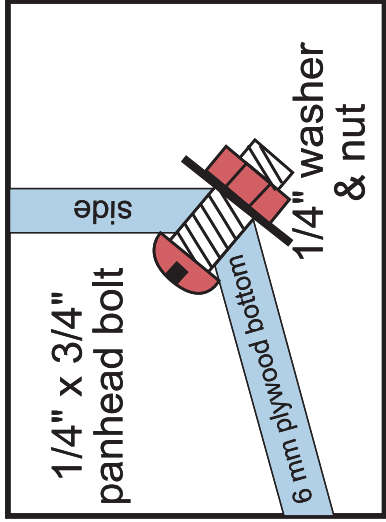
1/4" washer & nut
along keel seam

Bottom stern
edges of the
panels lined up!

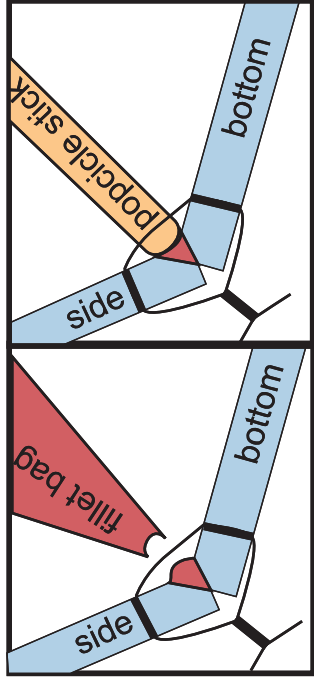


Drill holes in the side panels to match the ones already along the edges
of the two bottom panels. This will make sure the wire pull is even.

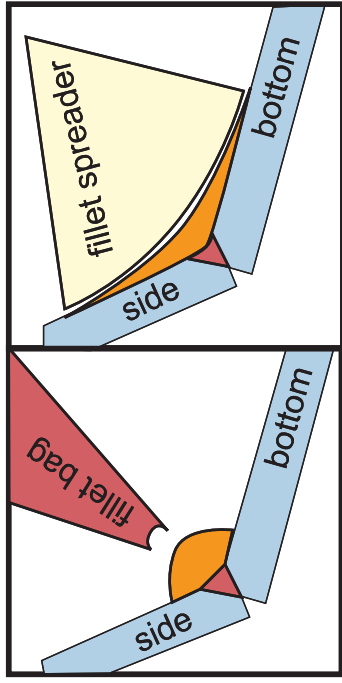




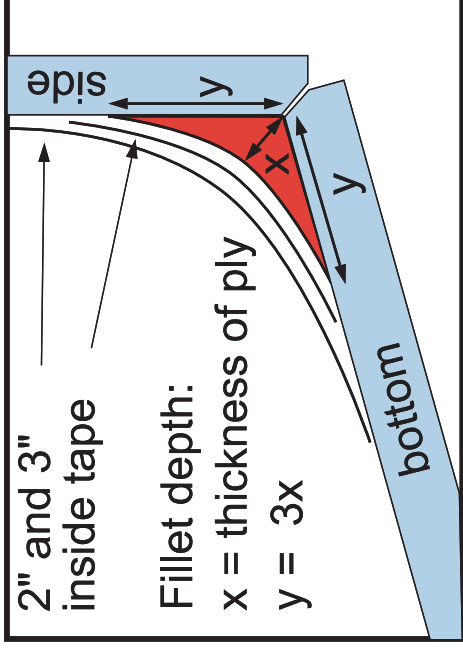
Wiring and bolting the panel sections together



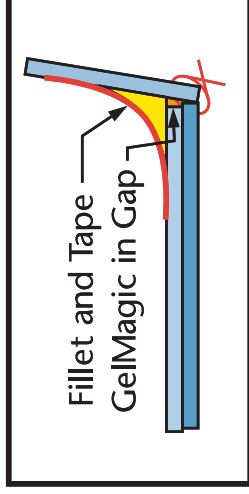
Jump Stitch



Applying and Spreading the Fillet

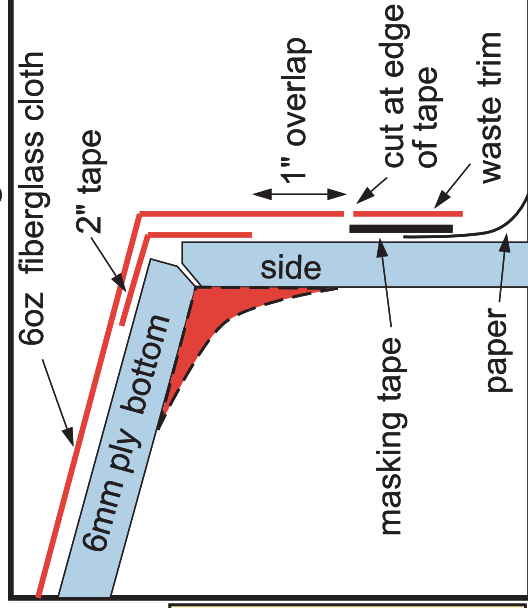


Cross section of taped seam



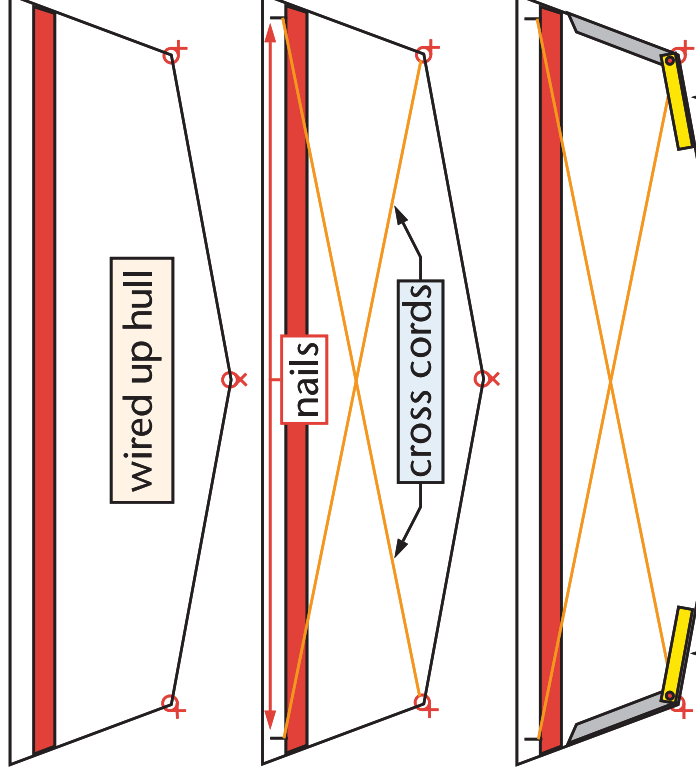
Double Transom Panel

Bottom outside edge details



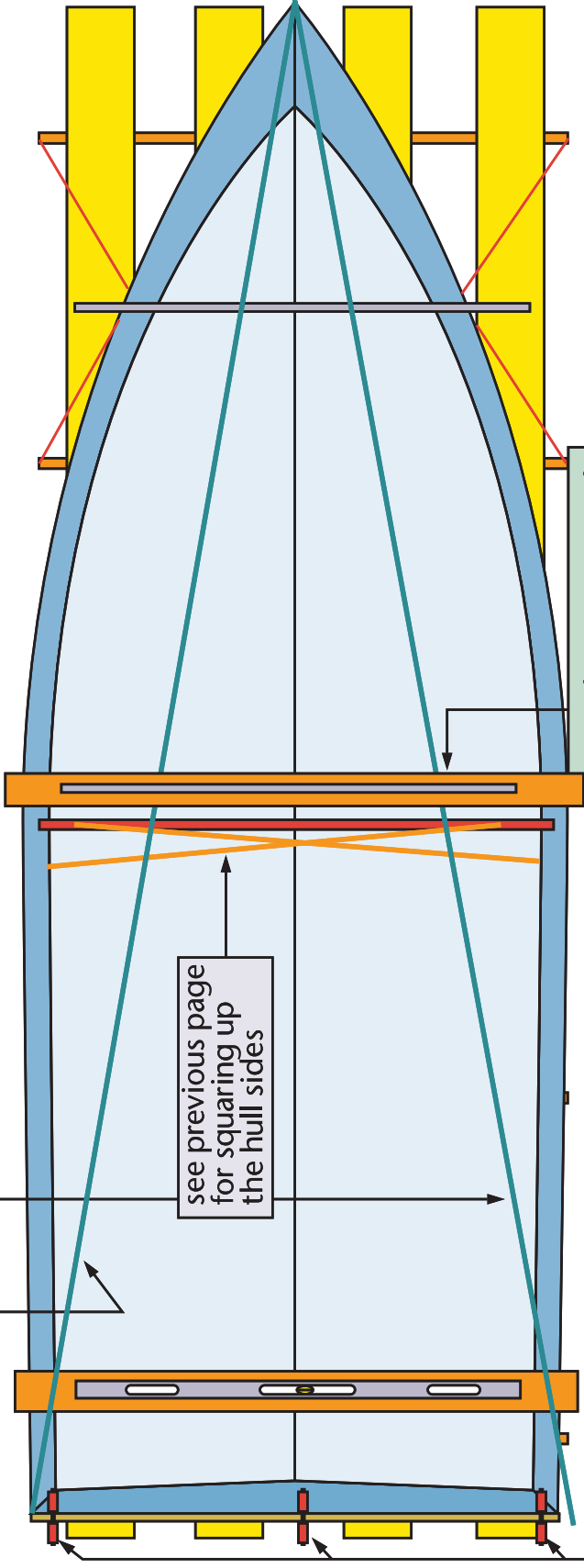
Read the instructions as you study these drawings. Each picture tells a story. Use the cardboard model you made to visualize the directions.

Squaring up the side to bottom panels at the beam of the hull



Compare the angles on both sides and tighten or loosen one or both "green" cords until the angles are the same. Recheck the level and square of the rest of the hull after you do this. Recheck again if those need adjusting too; until you are happy and the hull is level and square!

Cross hull tension lines used to "square up" the hull. Adjust until the "cross hull distances" are the same!

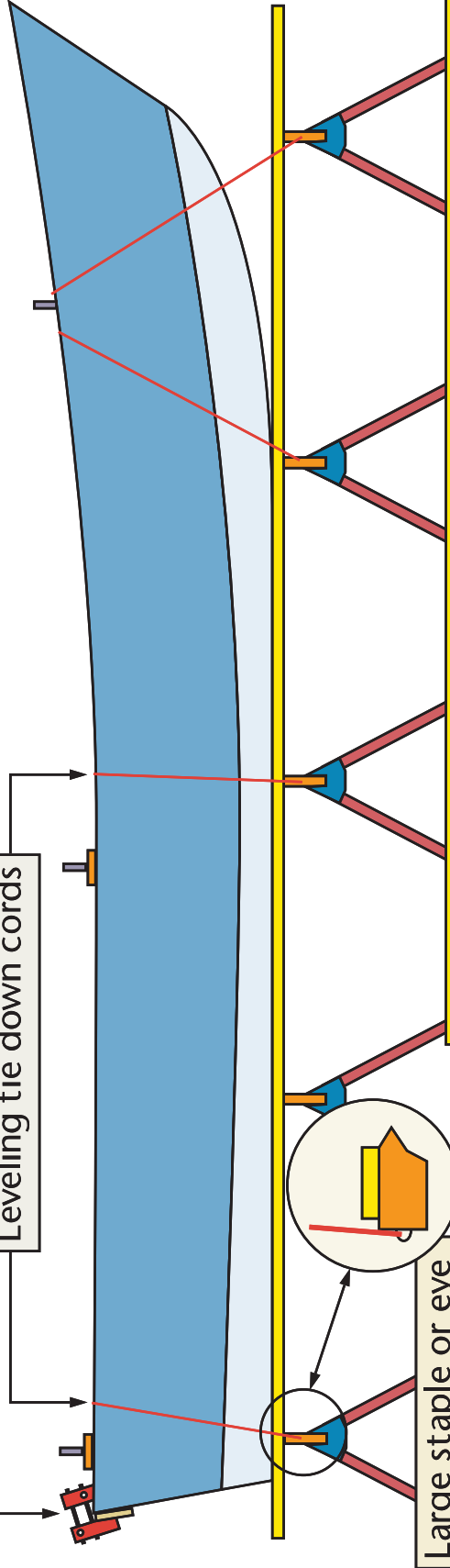


Wired up Hull

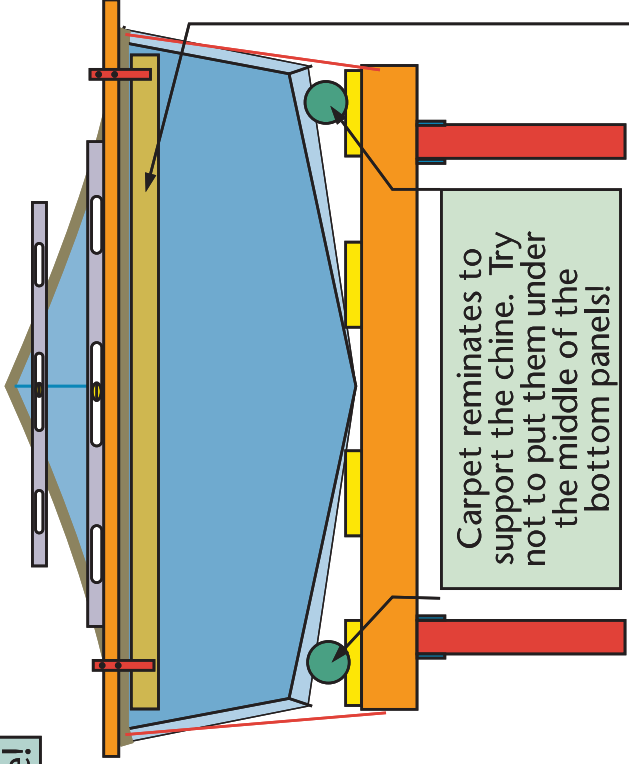
Extra wood clamped to transom panel to keep panel straight until the rails are on.

Page from the build set of the Reservoir 1525

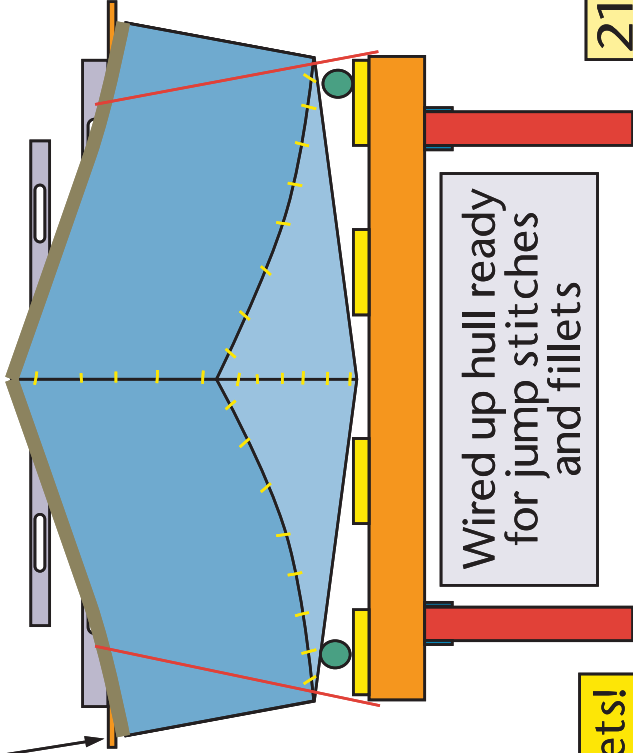
Leveling tie down cords



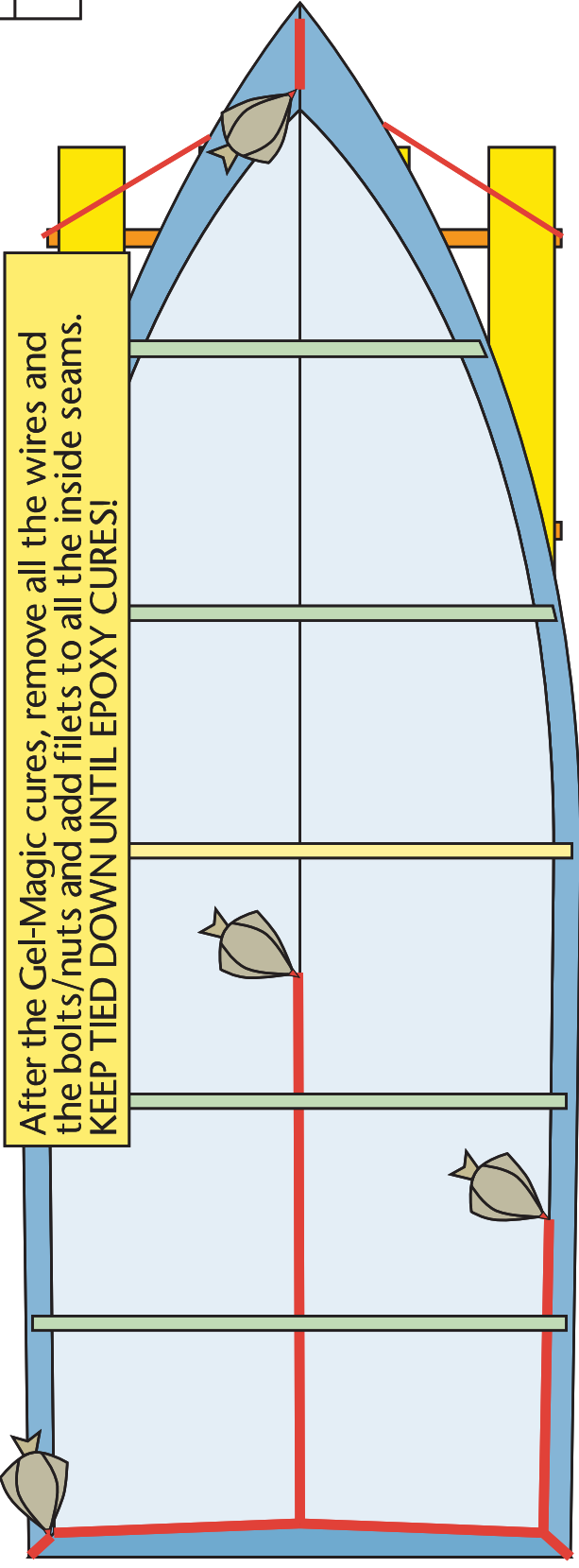
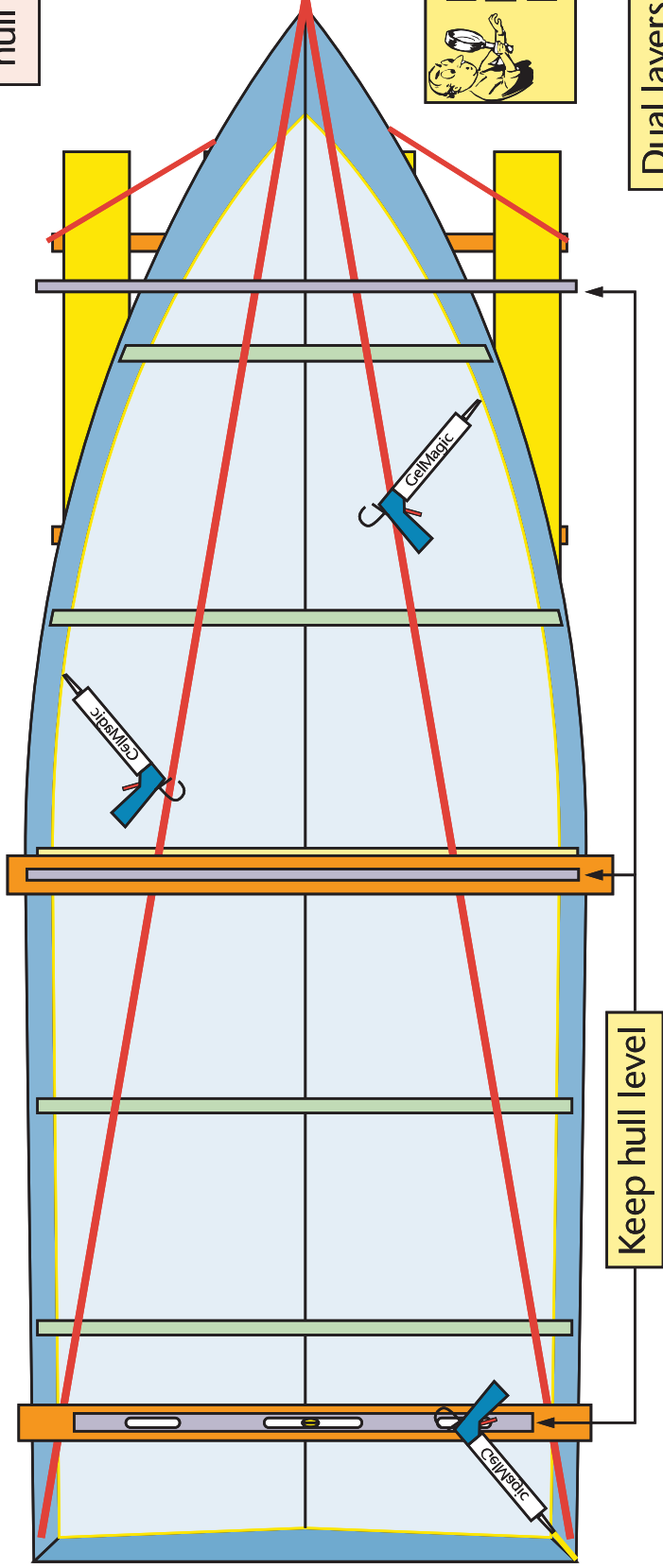
Level the hull prior to doing the "jump stitch" and seam fillets!



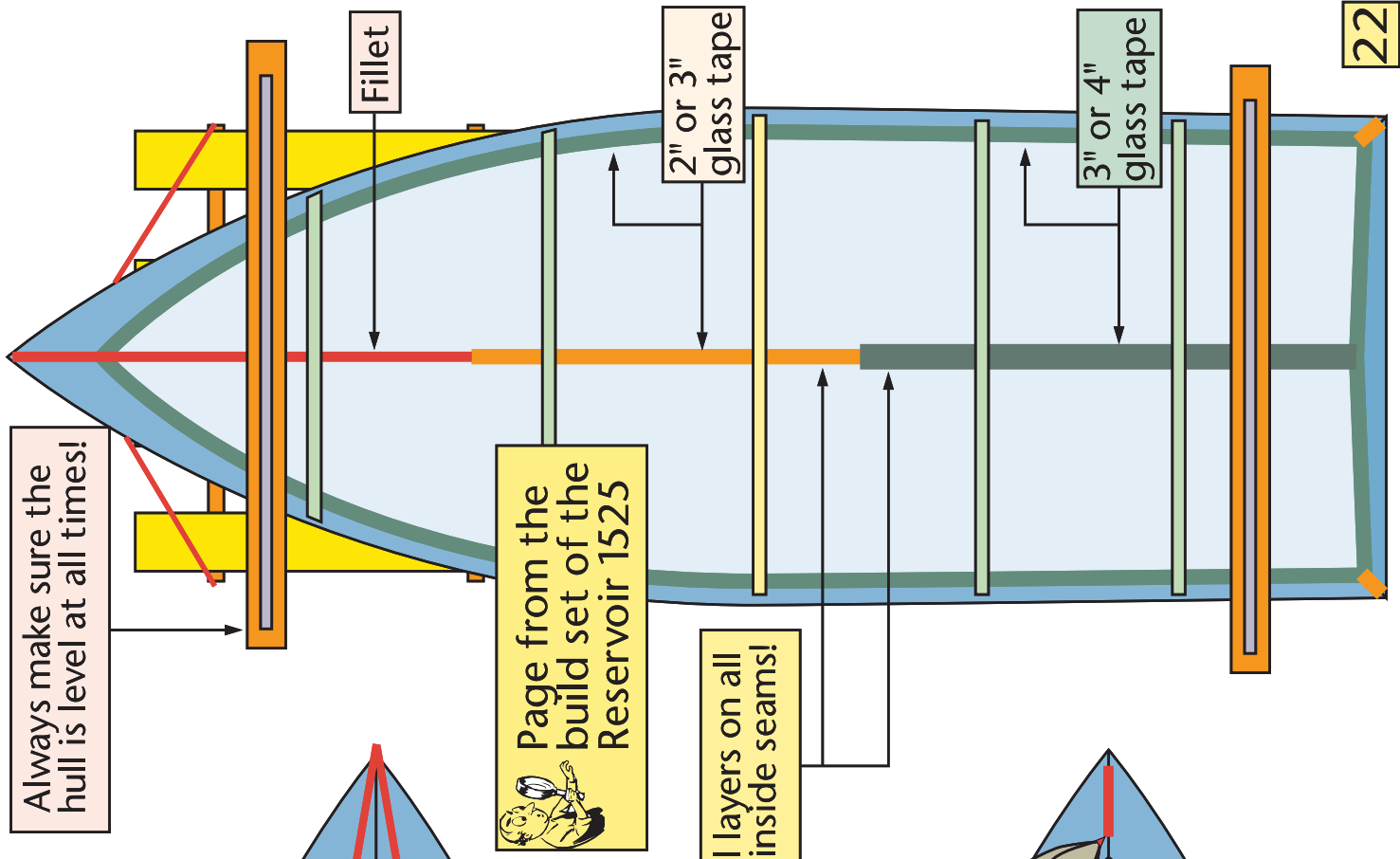
Until the rails are on, it helps to have some scrap wood clamped to the top of the stern panel to it keep straight!



With the hull leveled and tied down, it's time to Gel-Magic the seams with a "jump stitch"!



Always make sure the hull is level at all times!



Beam spreader set at (80") ahead of transom

Leave beam spreader in until the interior is complete!

Outside rail

Inside rail

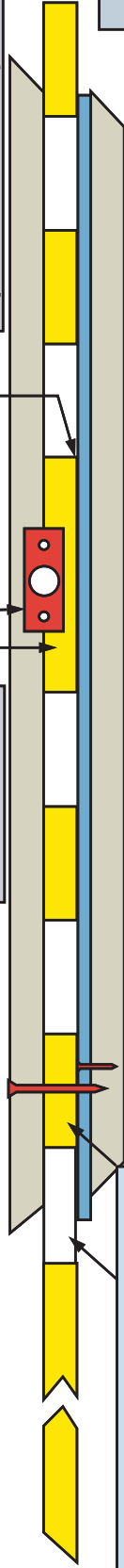


Note: Install the rails, corners, and spacer blocks before installing the interior of the hull. This will set the curves of the side hull panels first, then the interior panels can be installed to fit the boat .

With no oarlocks, start at the bow with a 12" spacer block on both sides and go 3" gap, 3" block to the transom along both rails, then stop when the last spacer block is 18" or less.

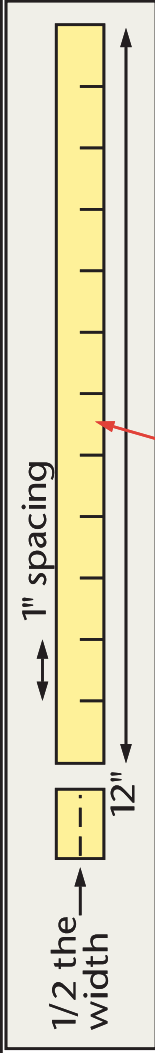
Note: The oarlock socket will be set at 12" behind the aft edge of where you set the middle seat!

Not to scale!



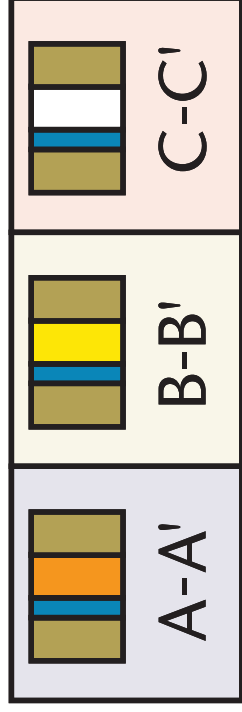
A 3" gap and a 3" spacer block look good

The oarlock socket block can be from 8" to 12" long. If you row go with the longer block.



Note: you may or may not install one!

1. Install the oarlock spacer block first
2. Measure off the first "gap" on either side
3. Install the first spacer block on either side of the oarlock spacer block
4. Repeat until you get to the end, and fill that space with a spacer block that will go to the corner. It will be longer than a normal spacer block



Yellow spacer rail lengths are cut to fit after you have made the 24" rail and 3" gaps/blocks.

24"

Rails and spacer blocks for this hull look good @ 5/8" x 1 1/2"

Decorative corner block option

45 degree end cuts

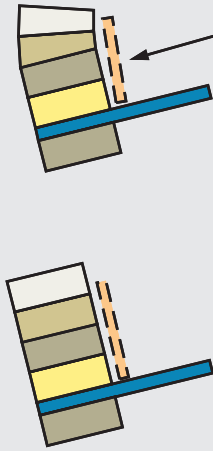
3" gap in rail

End blocks will be random lengths

Square ends

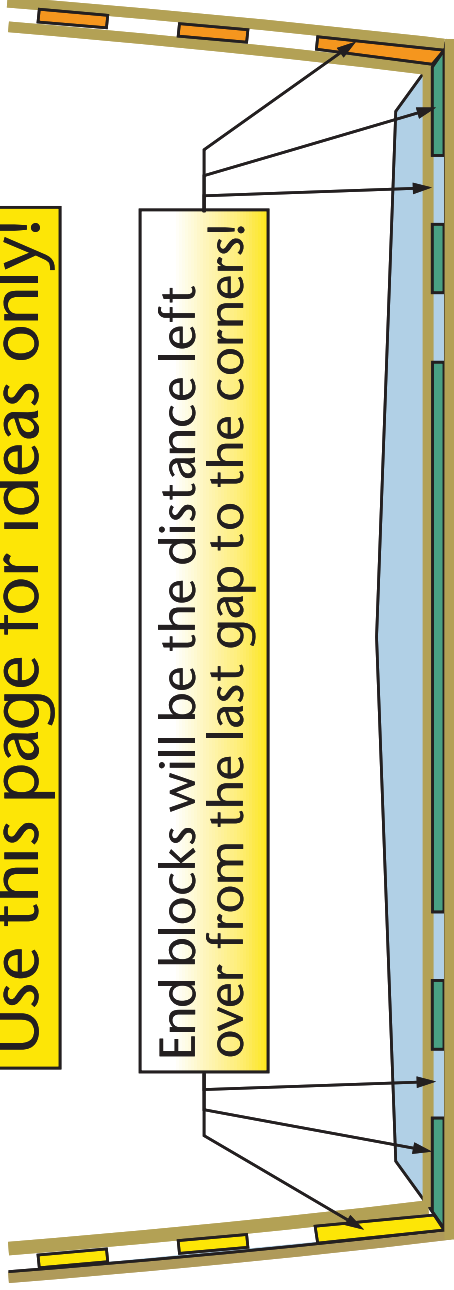
Use this page for ideas only!

To keep the height of the blocks down, it helps to put bevels in the two smaller blocks.

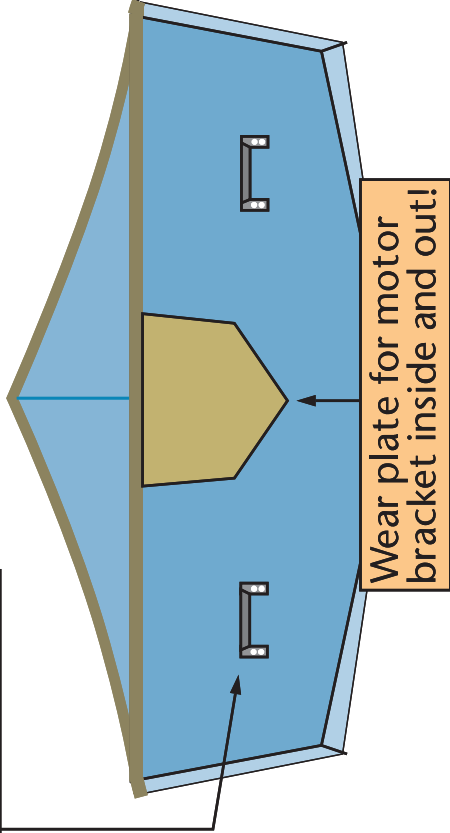


Use this page for ideas only!

End blocks will be the distance left over from the last gap to the corners!



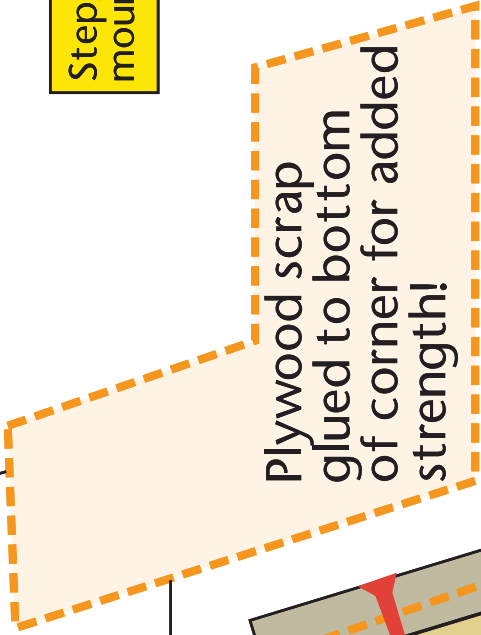
Step/safety handles mounted to transom



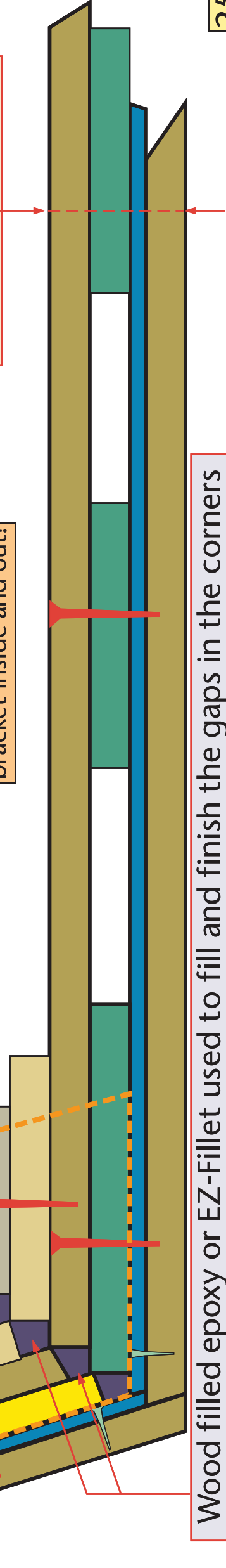
Page from the build set of the Reservoir 1525



Plywood scrap glued to bottom of corner for added strength!



Be sure your motor's bracket can span this width of rail!



Wood filled epoxy or EZ-Fillet used to fill and finish the gaps in the corners

Note: I do not know what you will do with your hull, but this is one way to strengthen the bow joints. There are many ways to do this and you can choose which works best for your boat.

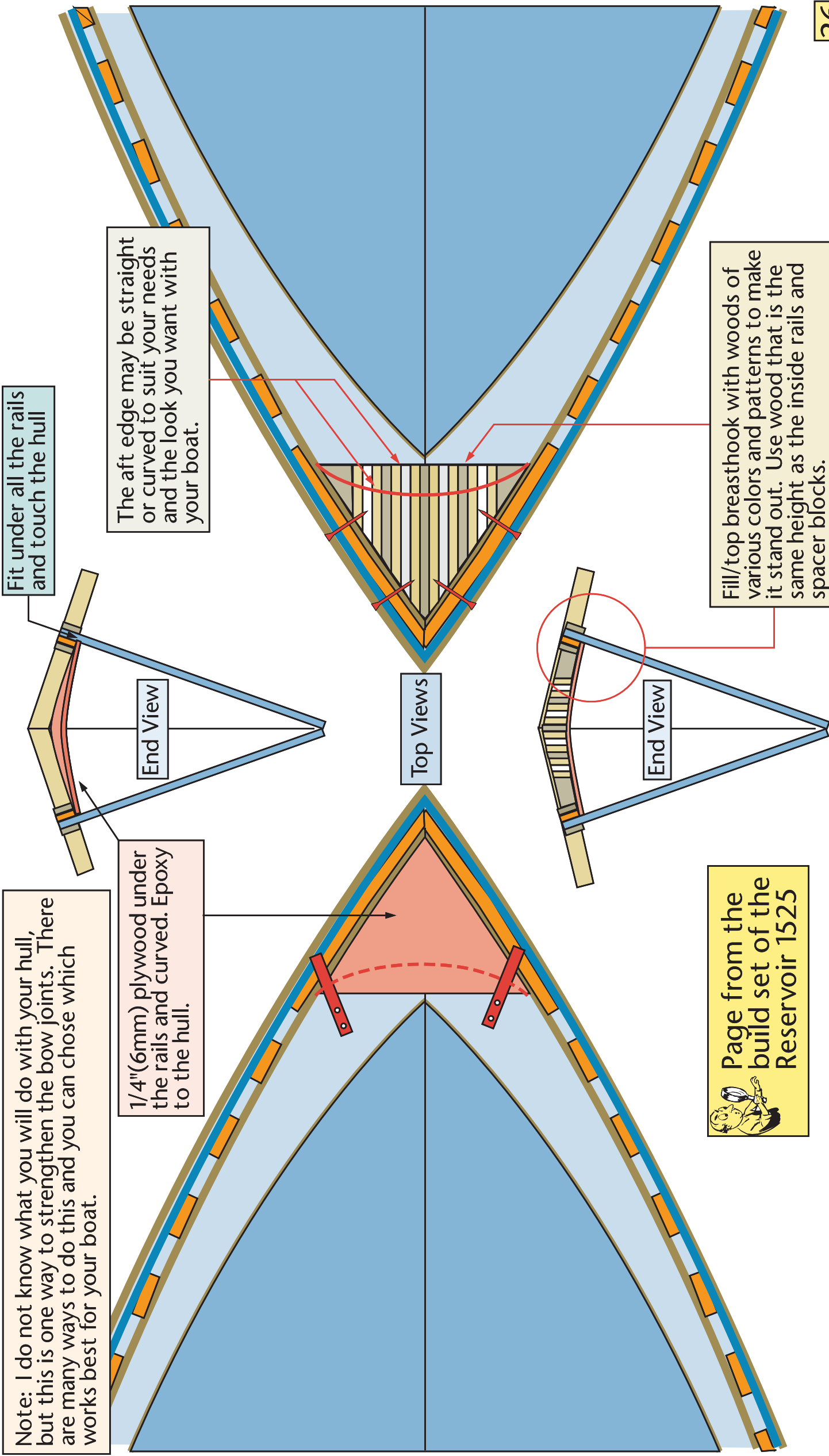
1/4"(6mm) plywood under the rails and curved. Epoxy to the hull.

Fit under all the rails and touch the hull

The aft edge may be straight or curved to suit your needs and the look you want with your boat.

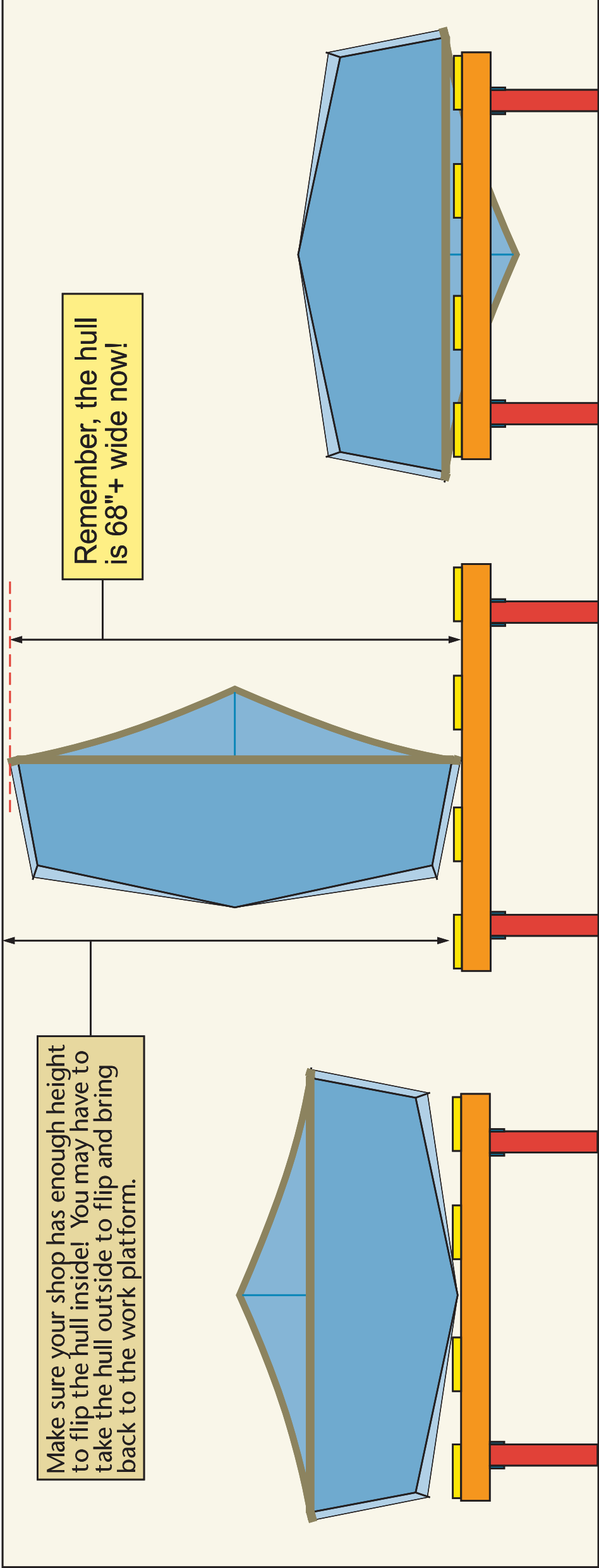
Page from the build set of the Reservoir 1525

Fill/top breasthook with woods of various colors and patterns to make it stand out. Use wood that is the same height as the inside rails and spacer blocks.



Make sure your shop has enough height to flip the hull inside! You may have to take the hull outside to flip and bring back to the work platform.

Remember, the hull is 68" + wide now!



With the rails and corners in the hull, it's time to roll the boat over to work on the bottom. It will be better to do this now before you install the interior and add a lot more weight to the hull and then have to roll it over. The hull is now "dimensionally" stable around the panel edges, and the shape will not change.



Note: Leave in the beam spreader 2x2 to help support the side panels, you may even want to add others ahead and behind the middle one to give the hull more support when you flip it over, and then back again!



Page from the build set of the Reservoir 1525

Thoroughly wet out the plywood edges at the seams with epoxy!

Fill all gaps with epoxy fillet material

Use a wide putty knife to smooth the fillet material into the groves. Make sure to keep most of the blade on the plywood to "fill the center" of the gap!

2" glass tape centered on all outside seams

Chine seam tape end cut to match

See page 30 for more details

Trim tape ends to match the corner angles!

Page from the build set of the Reservoir 1525

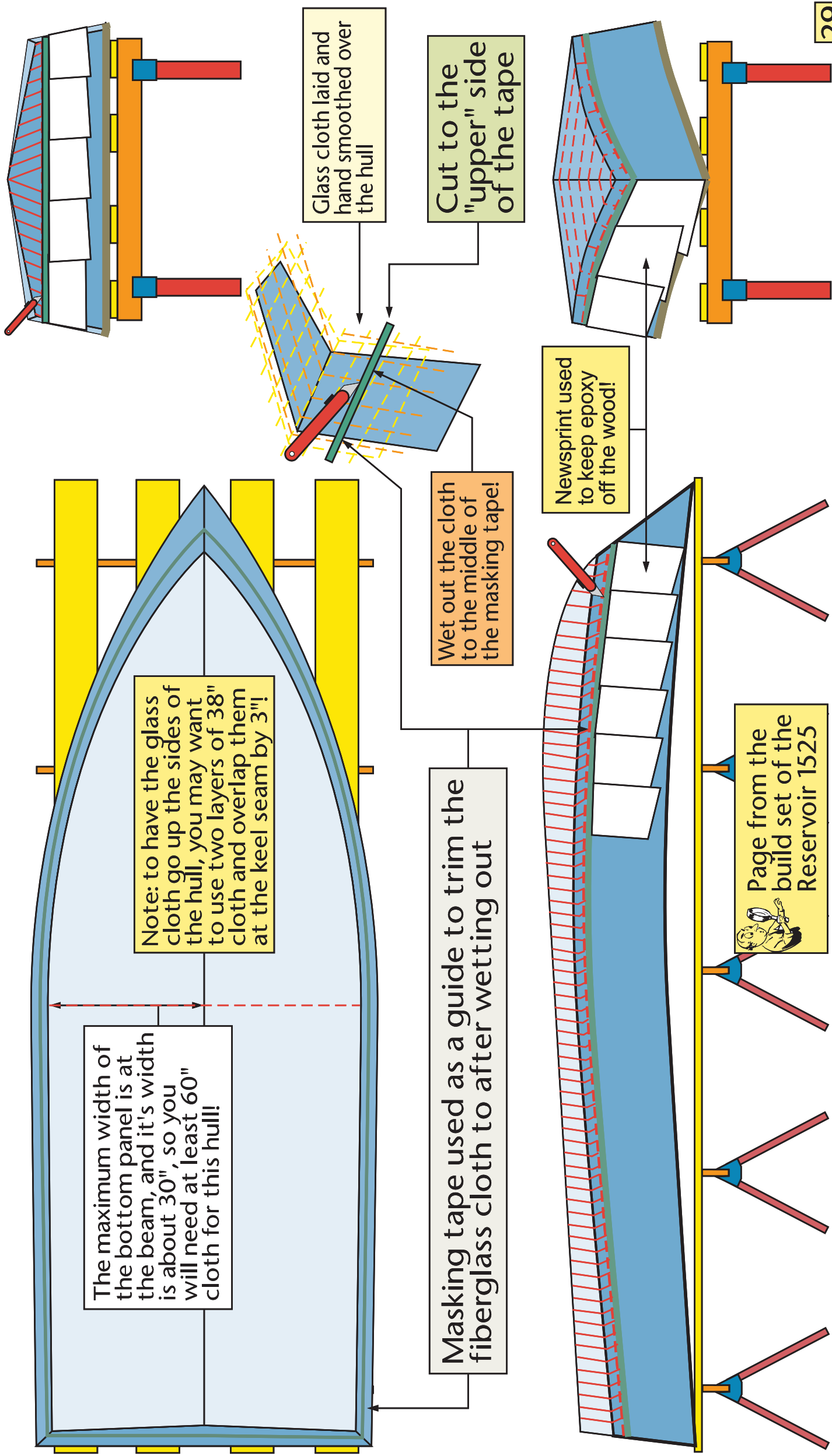
This corner will be rounded over when you add the glass tape

Single tape from transom to bow

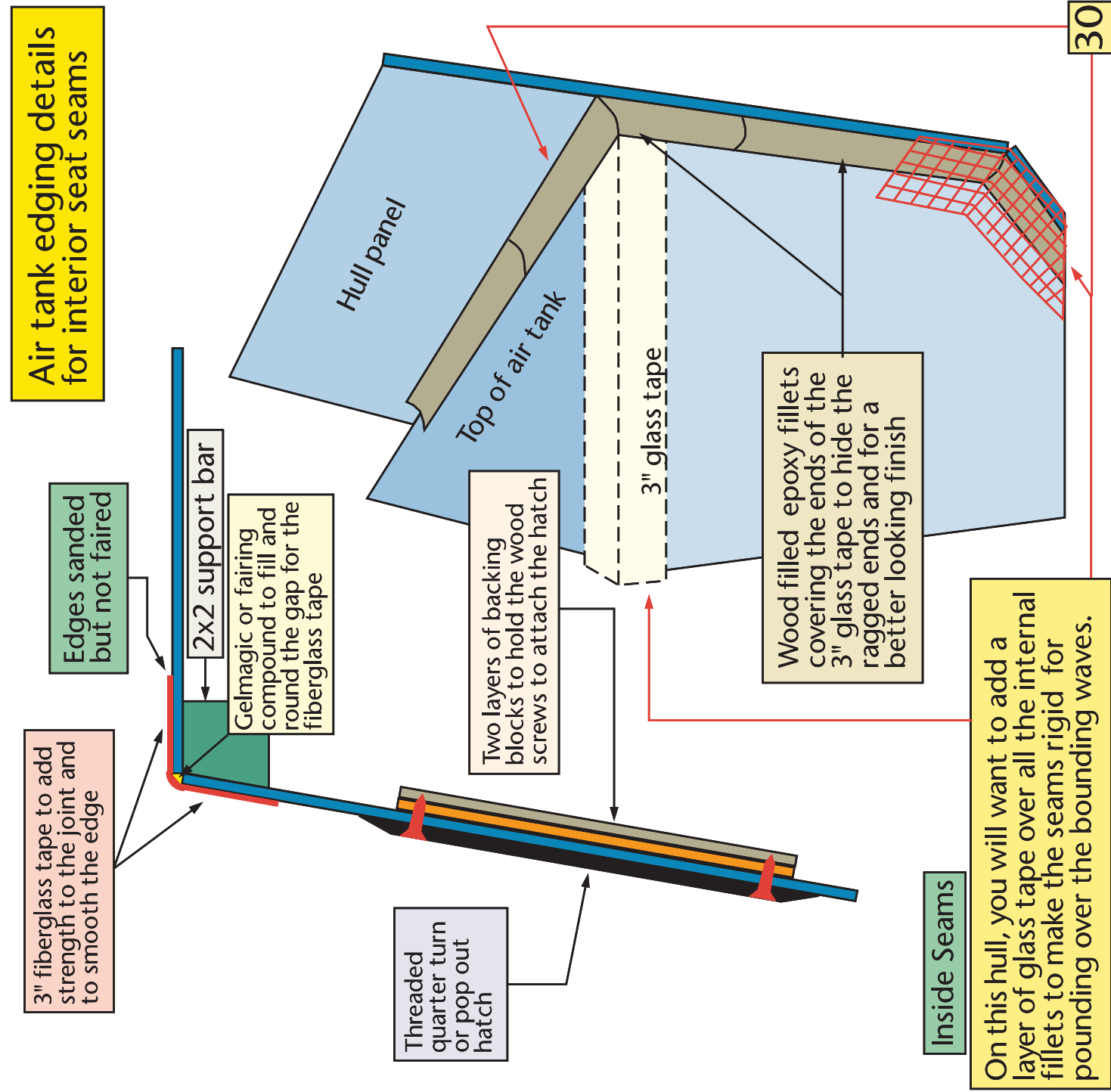
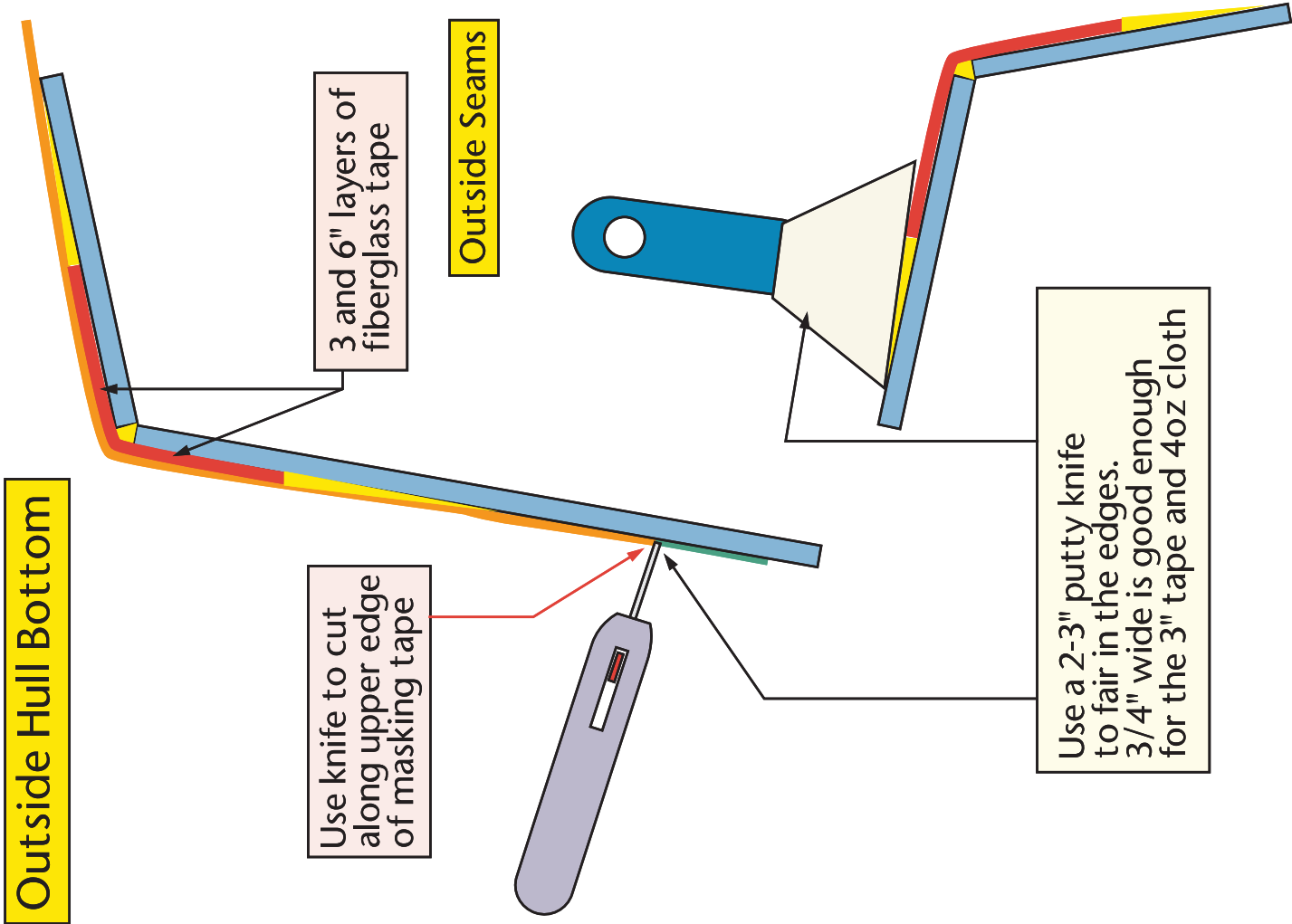
Use fairing compound to smooth and hide the edges of the glass tape

Or 3" tape if you used that on the inside of the hull

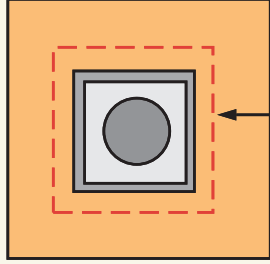
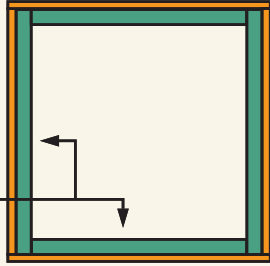
Outside seam details



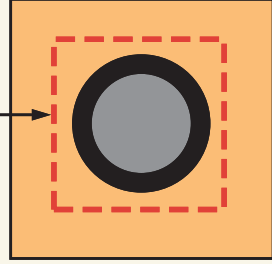
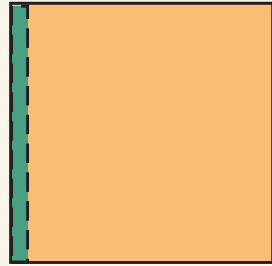
Outside Hull Bottom



2x2's to support seat top and have something to screw into

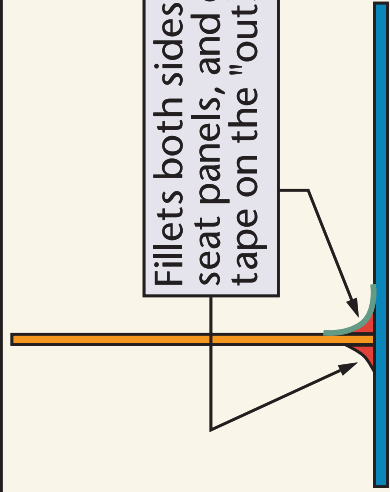


Backing plate



Side Edge Front
Hatch view of seat

The "inside fillet" is to keep water out of the joint, and to reduce the chance of rot!



Fillet both sides of all seat panels, and glass tape on the "outside"

Screw and epoxy 2x2's and frames



Details



Before installing "any" plywood in the hull, make sure that all the edges are coated with at least two coats of epoxy.



You may want to over bore the drain plug hole and fill it with fillet material and then fit the drain plug to that hole. That way you will have sealed off the plywood from water intrusion from around the drain fitting and keep rot from getting a foot hold in the hull!

Page from the build set of the Reservoir 1525



Shape fillet material to fill in the space between the bottom of the drain plug and the hull to help drain all the water out!

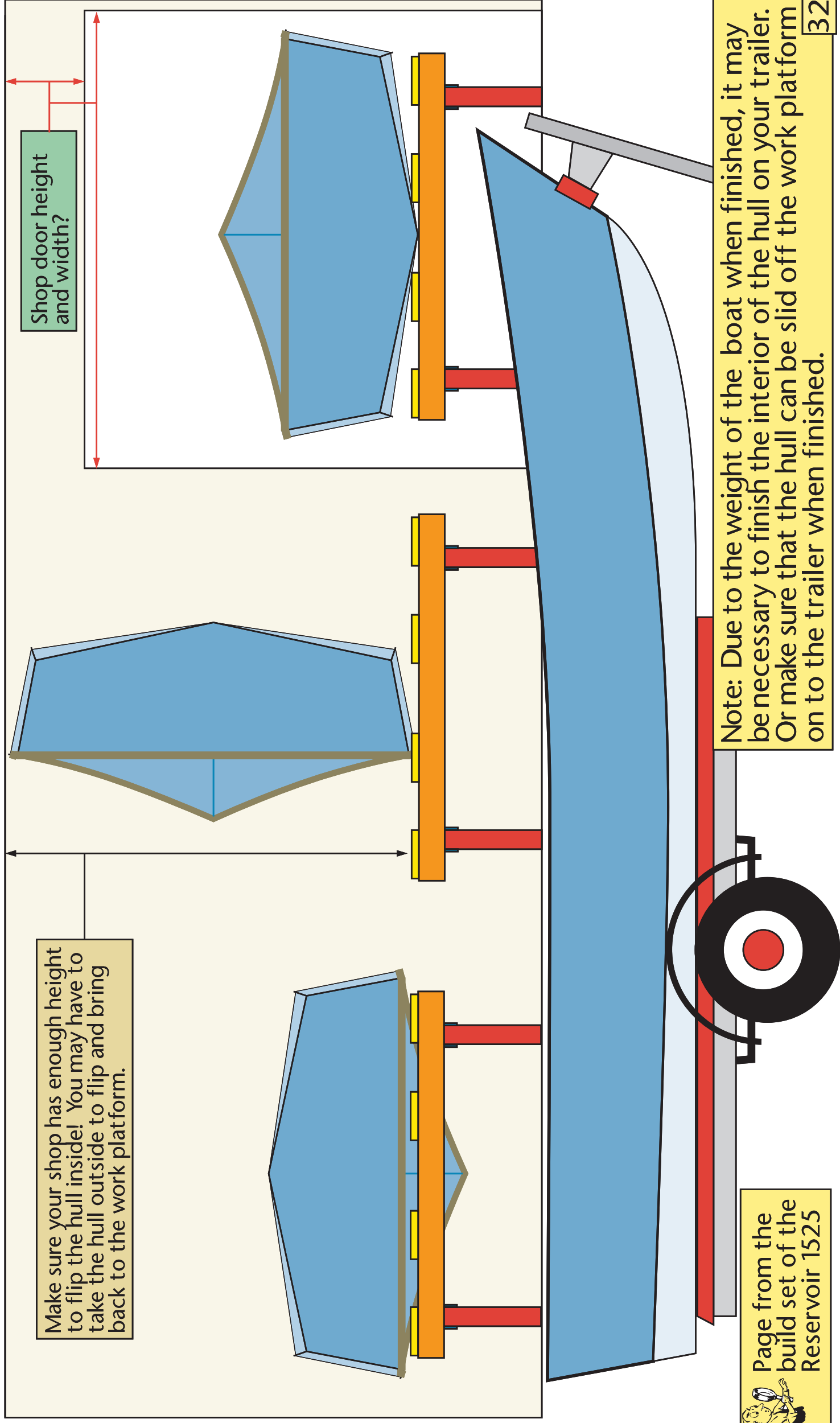
Glass cloth on outside corners



Fillet inside corners and all panel seams

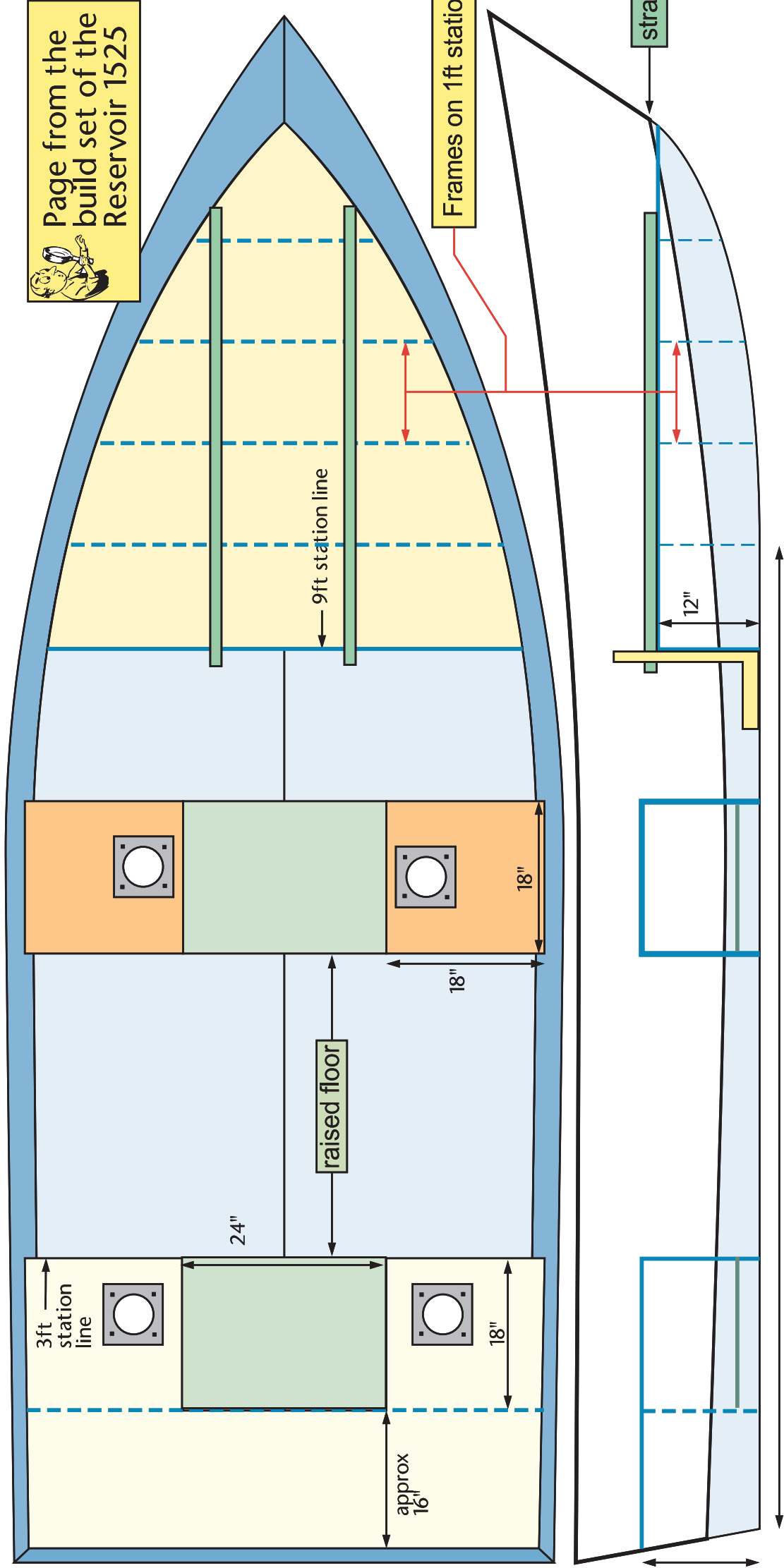
Top View

Fillet as many sides and edges as you can; this will keep water out of the seams and prevent a rot from getting a foot hold in the hull! Paint everything, and paint any areas that will be hard to get to before you cover them forever!



See
Page
#35!

Page from the
build set of the
Reservoir 1525



Frames on 1ft station lines

9ft station line

raised floor

24"

3ft
station
line



18"

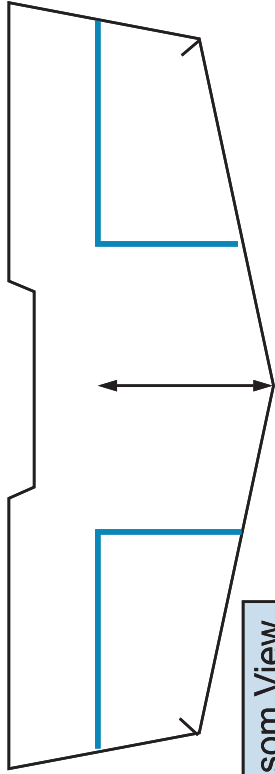
approx
16"

straight 2x2's

12"

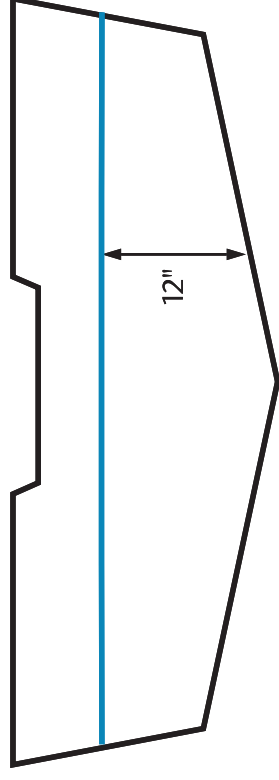
Note: This is just an idea, and you can build your interior however you want. Just make sure that the hull is "balanced"!

The keel should have a straight line between the transom and a point below the 10ft station cut mark on the hull rails. Use a rafter's square to set the end bulkhead to be square with the hull. Use "straight" 2x2's to locate the top of the others frames.

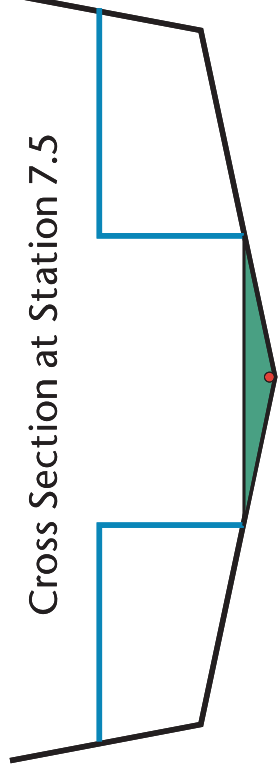


Transom View

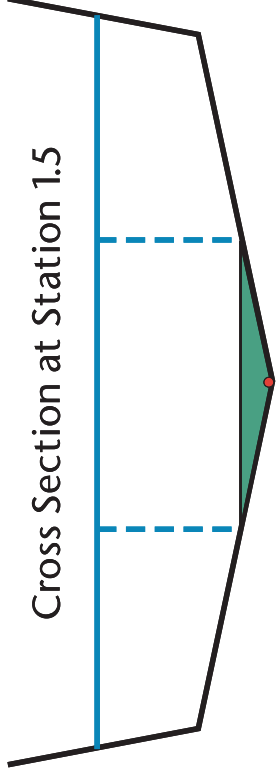
Cross Section at Station 0



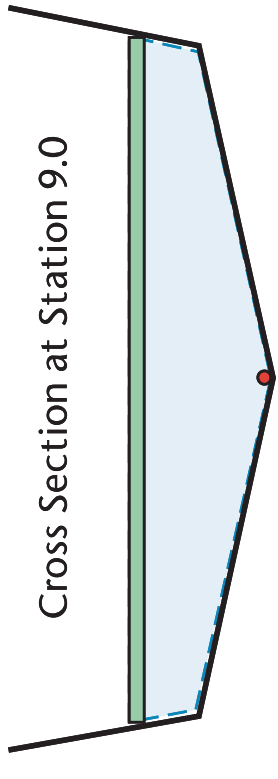
Cross Section at Station 7.5



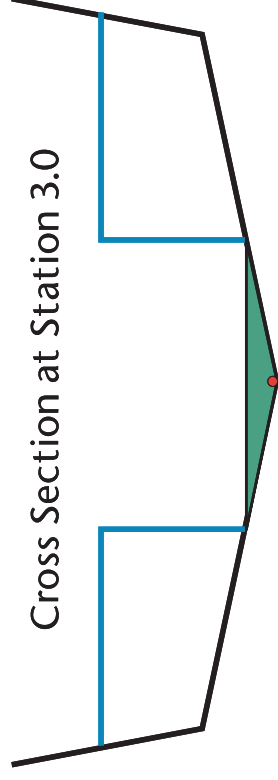
Cross Section at Station 1.5



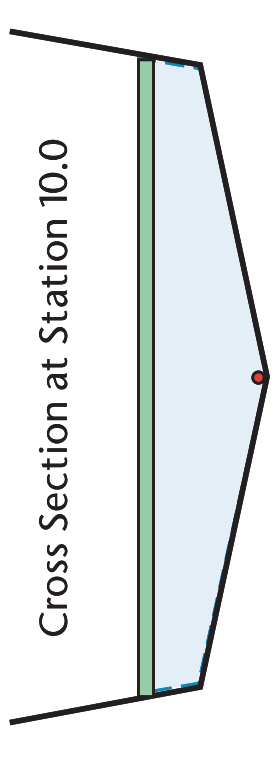
Cross Section at Station 9.0



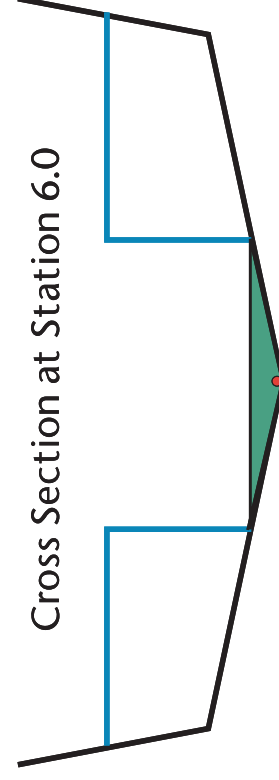
Cross Section at Station 3.0



Cross Section at Station 10.0

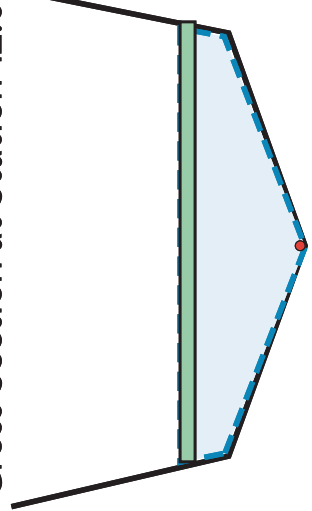


Cross Section at Station 6.0

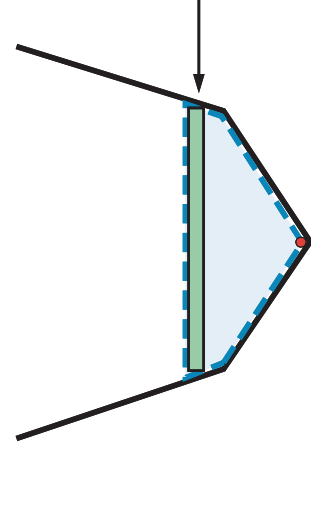


Limber Hole

Cross Section at Station 12.0

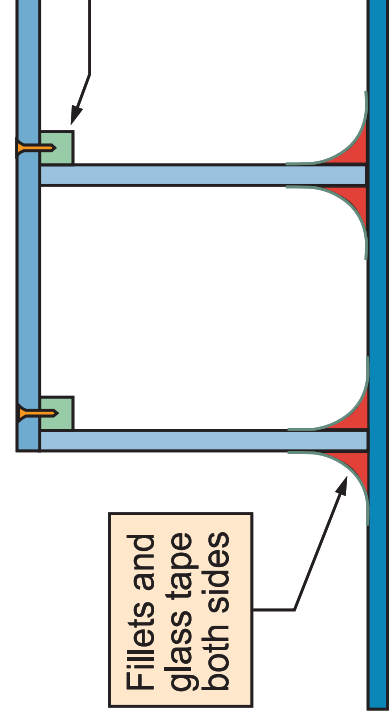


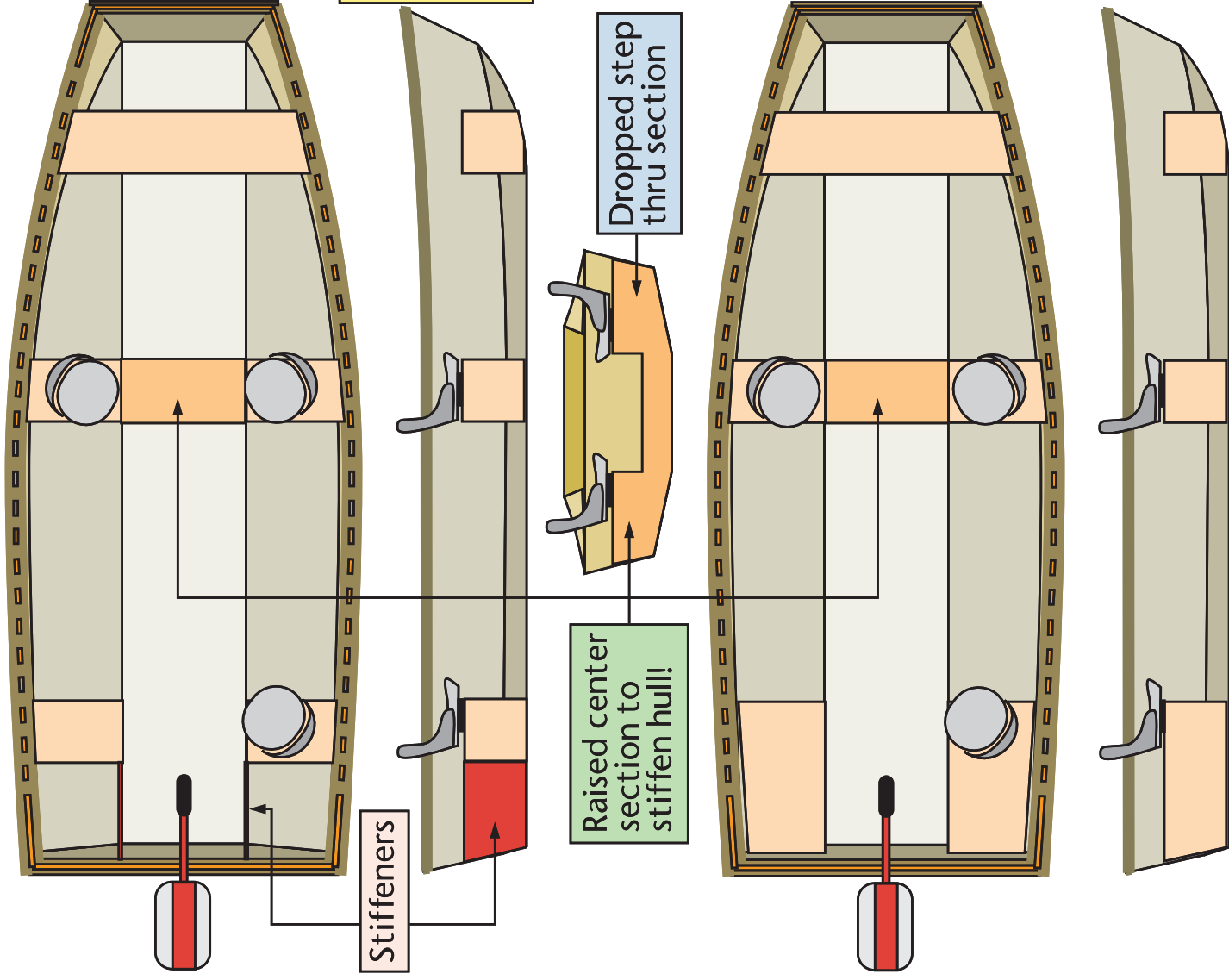
Cross Section at Station 13.0



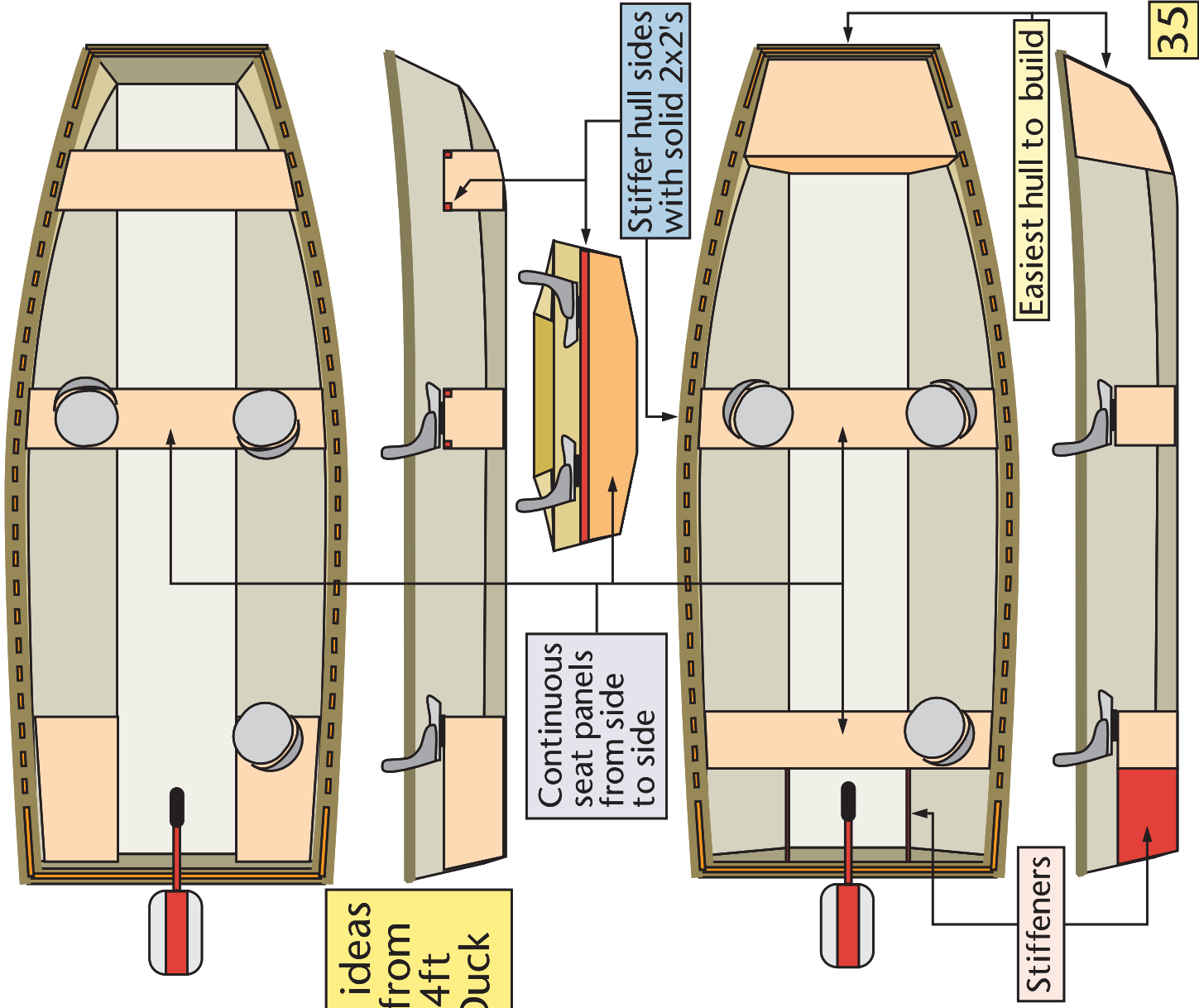
2x2's attached to the frames to support the deck and have something to screw into to hold in them place.

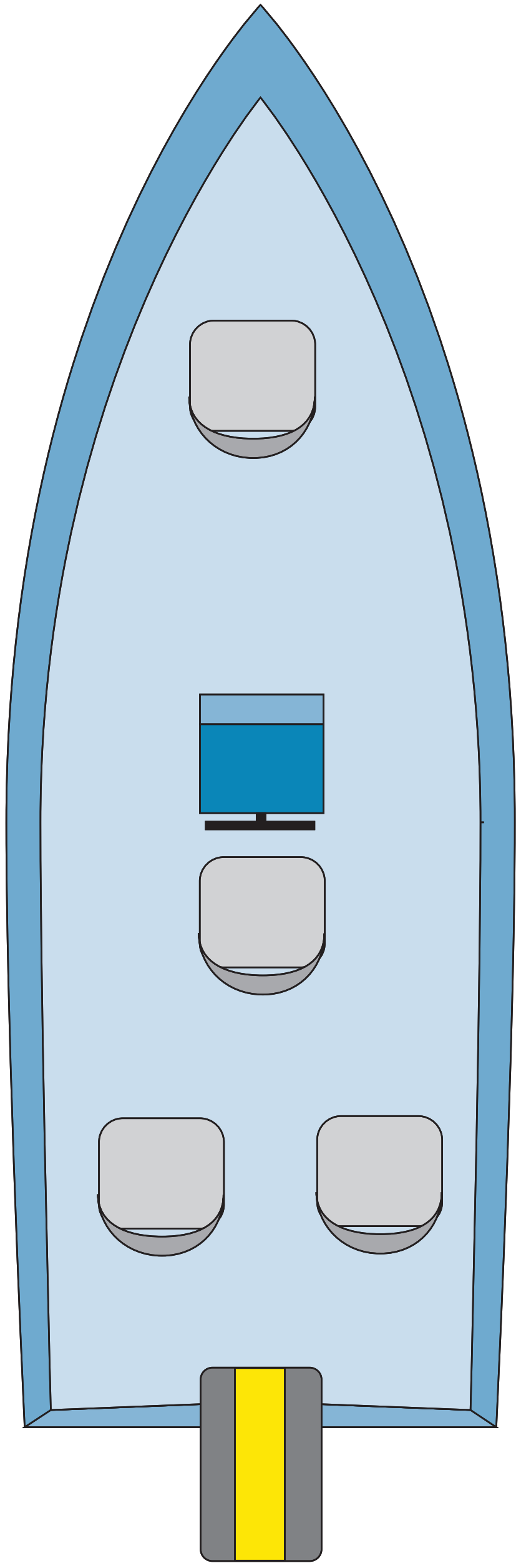
Fillets and glass tape both sides



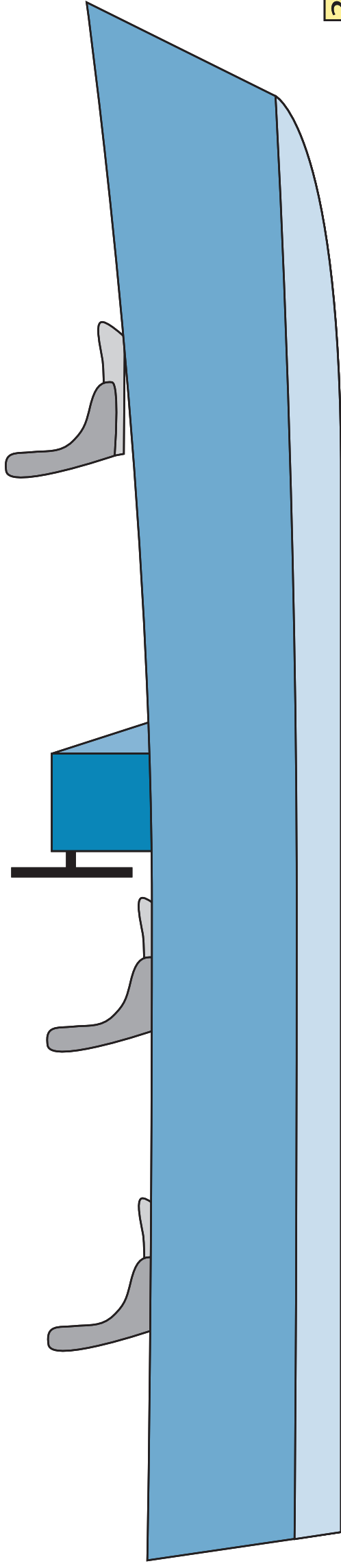


Interior ideas taken from the 14ft John Duck





Possible idea, but I would install "floors" like I have shown in the Oahe 1530!



The following pages are taking from the Oahe 1530 Plan Set. I've added them for ideas on constructing the interior of the 16ft Leland Lake. Download the whole Oahe Study Plan Set for more ideas on constructing this hull.

You may want to change the layout on your hull, and the following pages will give you the details on how to install your ideas into your hull. Keep in mind how much wood you are adding to the hull so you don't go over the Max Weight Limit listed in the plans!

The details of getting to this point will be shown in the following how to pages!

Seam Joint!

Flat floor model with platform seats!

Note: This point will change depending on the height of your bow platform!

Page from the Oahe 1530 Build Set!

Plywood "frames" to support the 2x2's. Details in the following pages

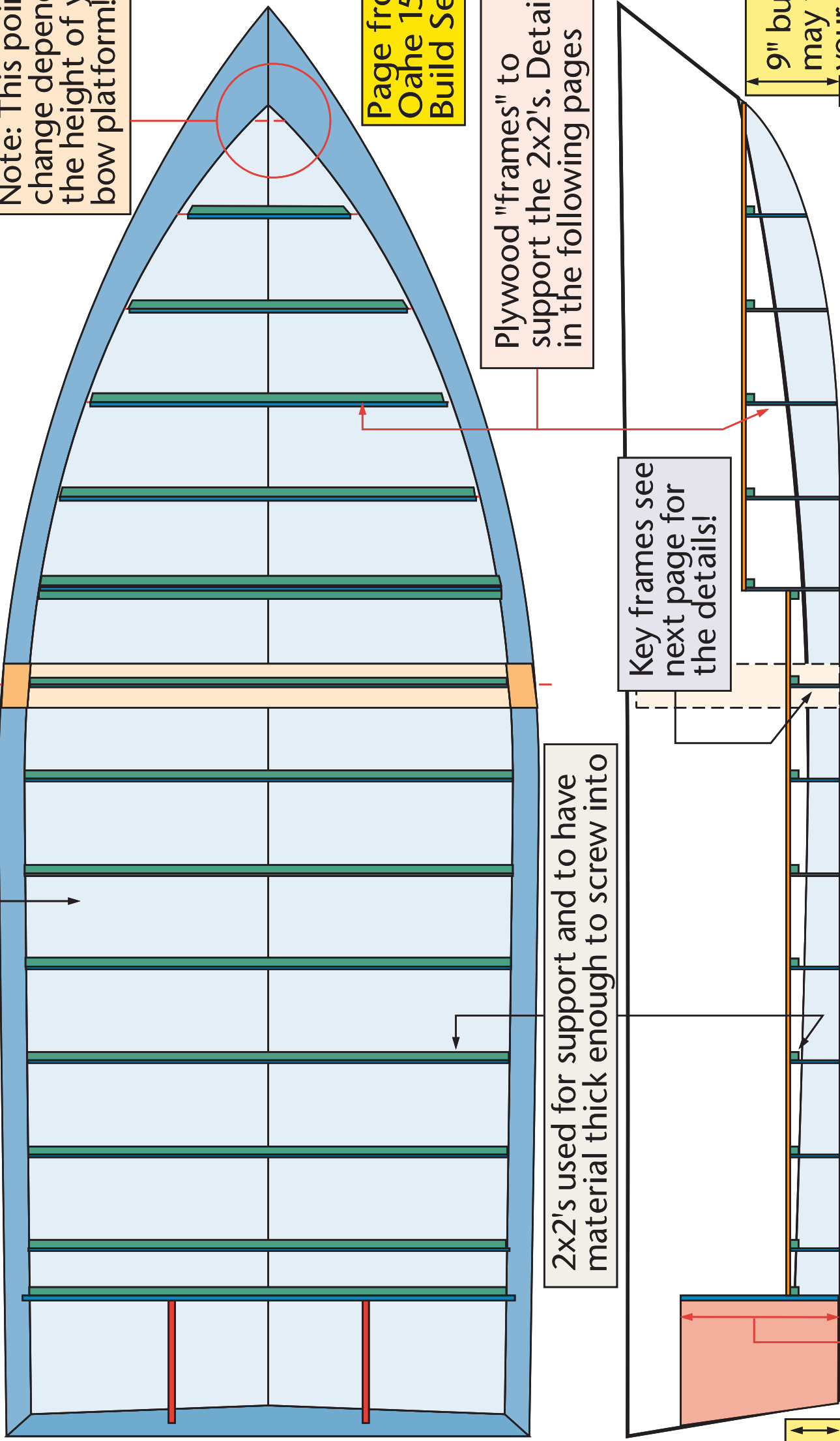
2x2's used for support and to have material thick enough to screw into

Key frames see next page for the details!

9" but this may vary for your hull!

Same height as transom cutout or higher

6"



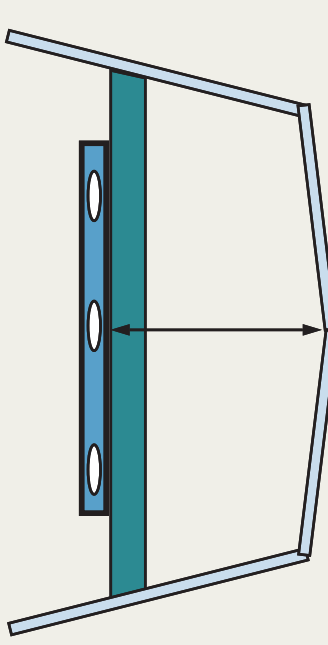
Fillets and glass tape on both sides of the false transom and supports!

Seam position NOT to scale, but is in the general area!

Note: the false transom and the 9" riser bulkhead need to be installed first on the hull. Everything is set from their positions!

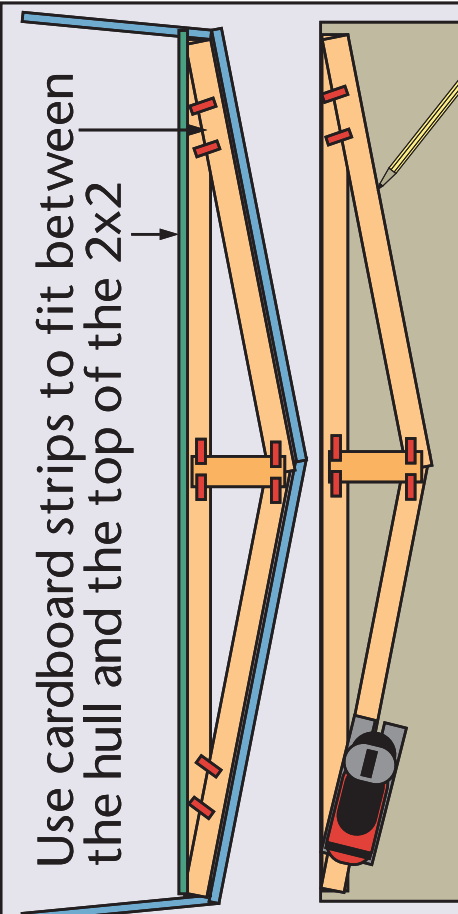
First frame 2x2 set at 9ft from the transom, but you may want to move it forward more

Trim ends of the 2x2 so it fits level in the hull and top at 9" above the center of the keel and epoxy in place

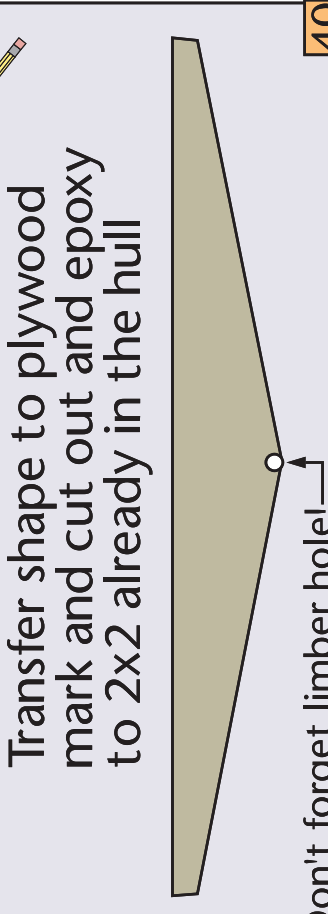


Not to scale

Use cardboard strips to fit between the hull and the top of the 2x2

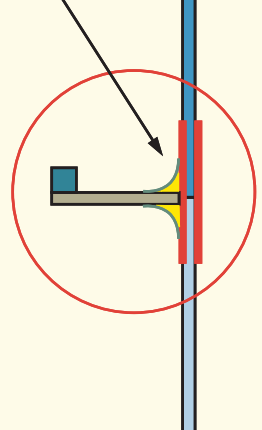


Transfer shape to plywood mark and cut out and epoxy to 2x2 already in the hull



Don't forget limber hole!

How to add the first floor riser on the panel seam between the two plywood sections.



Fillets and glass tape already on both sides!

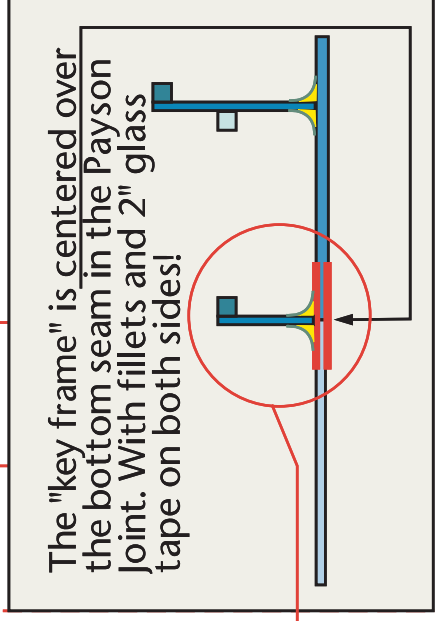
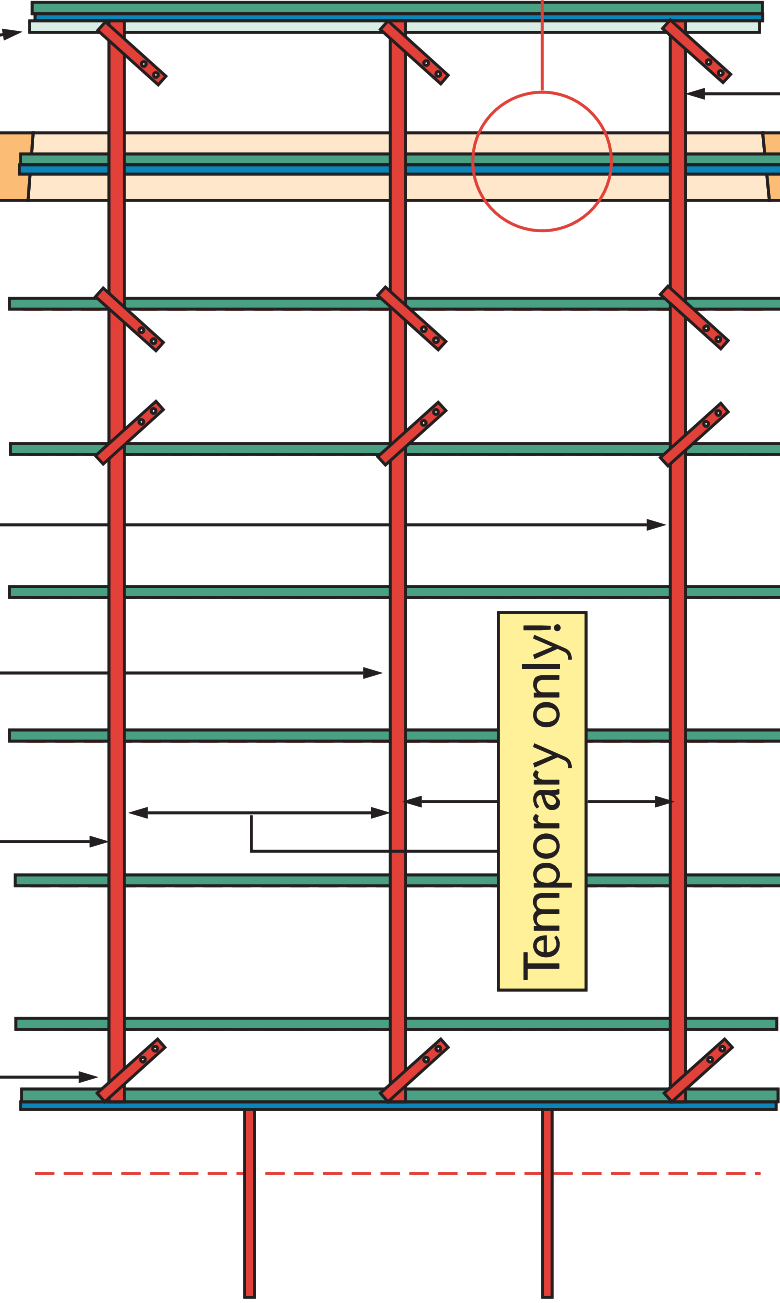
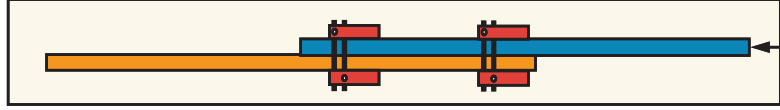
Page from the Oahe 1530 Build Set!

Clamp in place

"Straight" 2x2's set on the false transom and riser 2x2's

6" 2x2

2x2 set on false transom with epoxy and SS screws

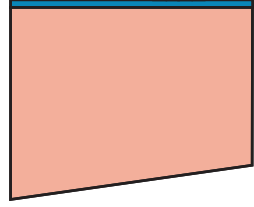


The "key frame" is centered over the bottom seam in the Payson joint. With fillets and 2" glass tape on both sides!

Use a set of "slider" 2x2's as a gage to find the lengths of the permanent 2x2's

Fit and level each 2x2 to "it's" location and epoxy in place

These 2x2's are used to "locate" the frame 2x2's in the hull so the plywood frames can be leveled to them later



9" 2x2

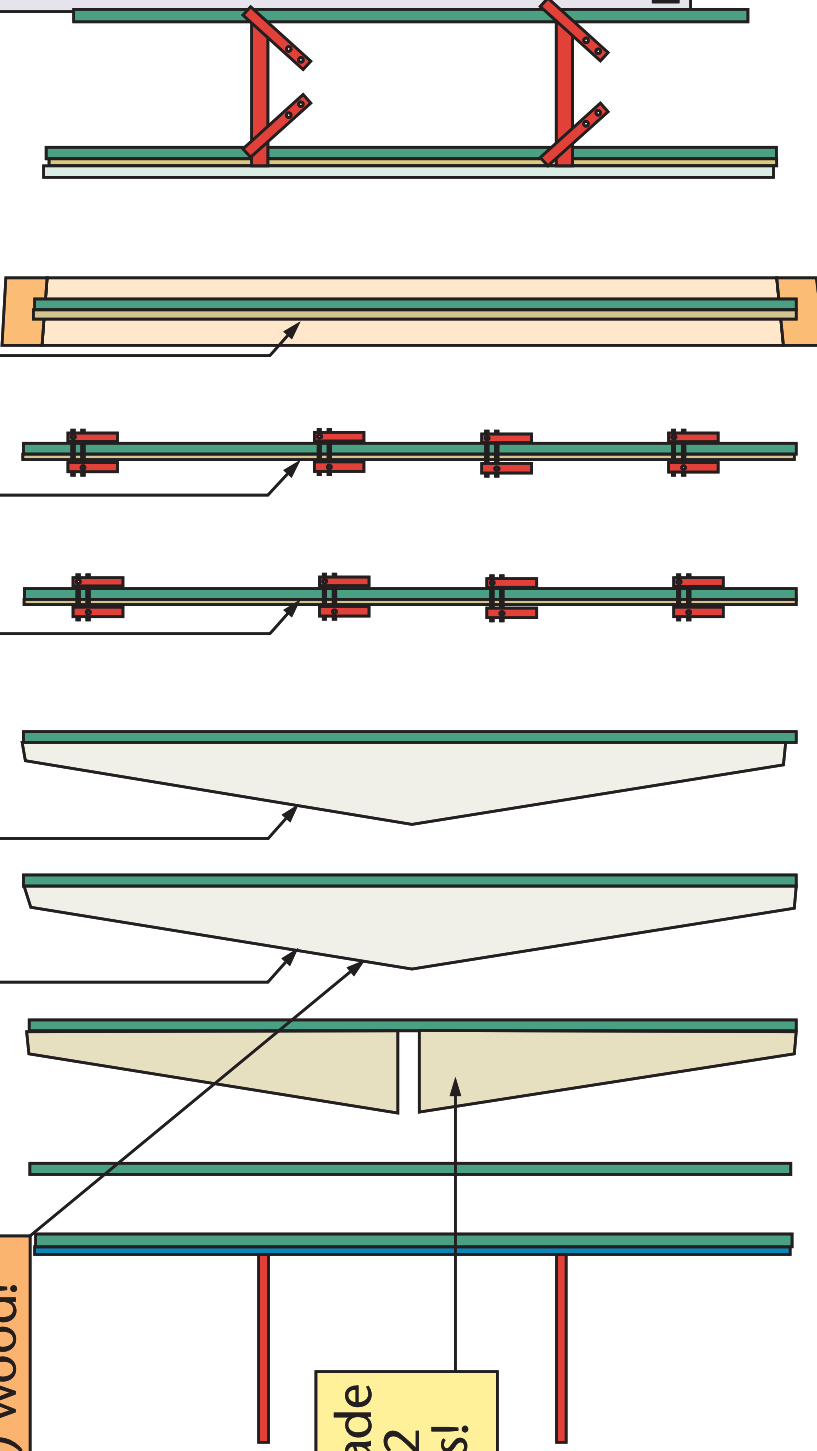
Key frame

Level front to back!

Page from the
Oahe 1530
Build Set!

Frames may be made from 1/4" (6mm) wood!

Use this method to make each plywood frame!



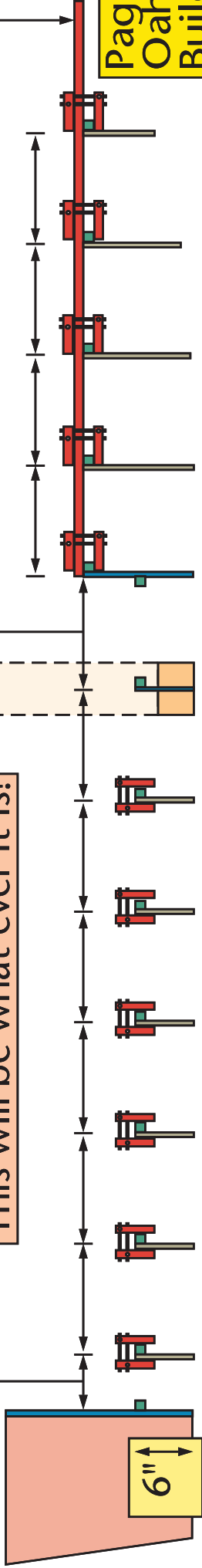
Or made from 2 pieces!

Note: It may be easier to make the frames as two pieces to save on wood!



Same process to install and level the 2x2's under the bow platform

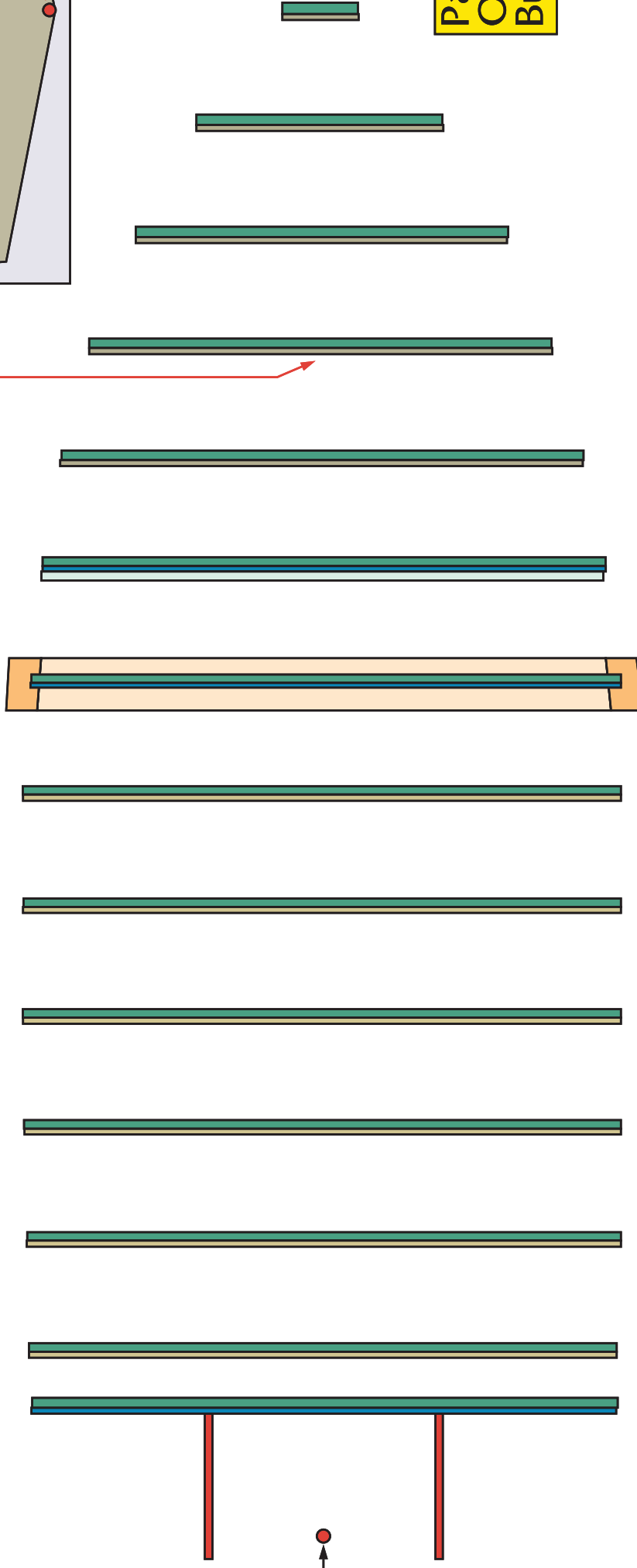
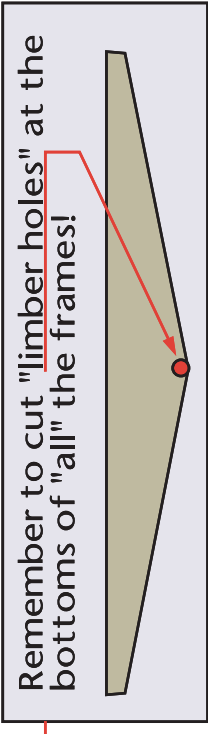
This will be what ever it is!



6"

Page from the Oahe 1530 Build Set!

This is the completed layout of all the frames and 2x2's in the hull, and the "floor surfaces will be shown on the following pages!

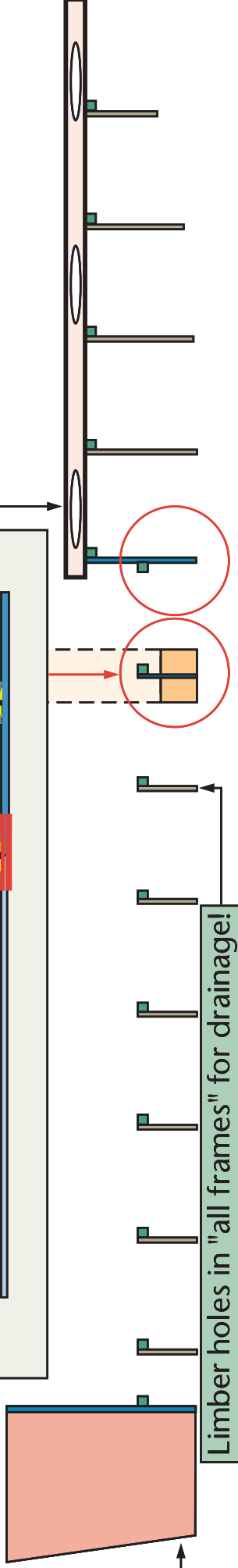


Hole for drain plug!

Page from the Oahe 1530 Build Set!

The "key floor" and the "riser frame" are filleted and glass taped on both sides, and the others are only done on one side

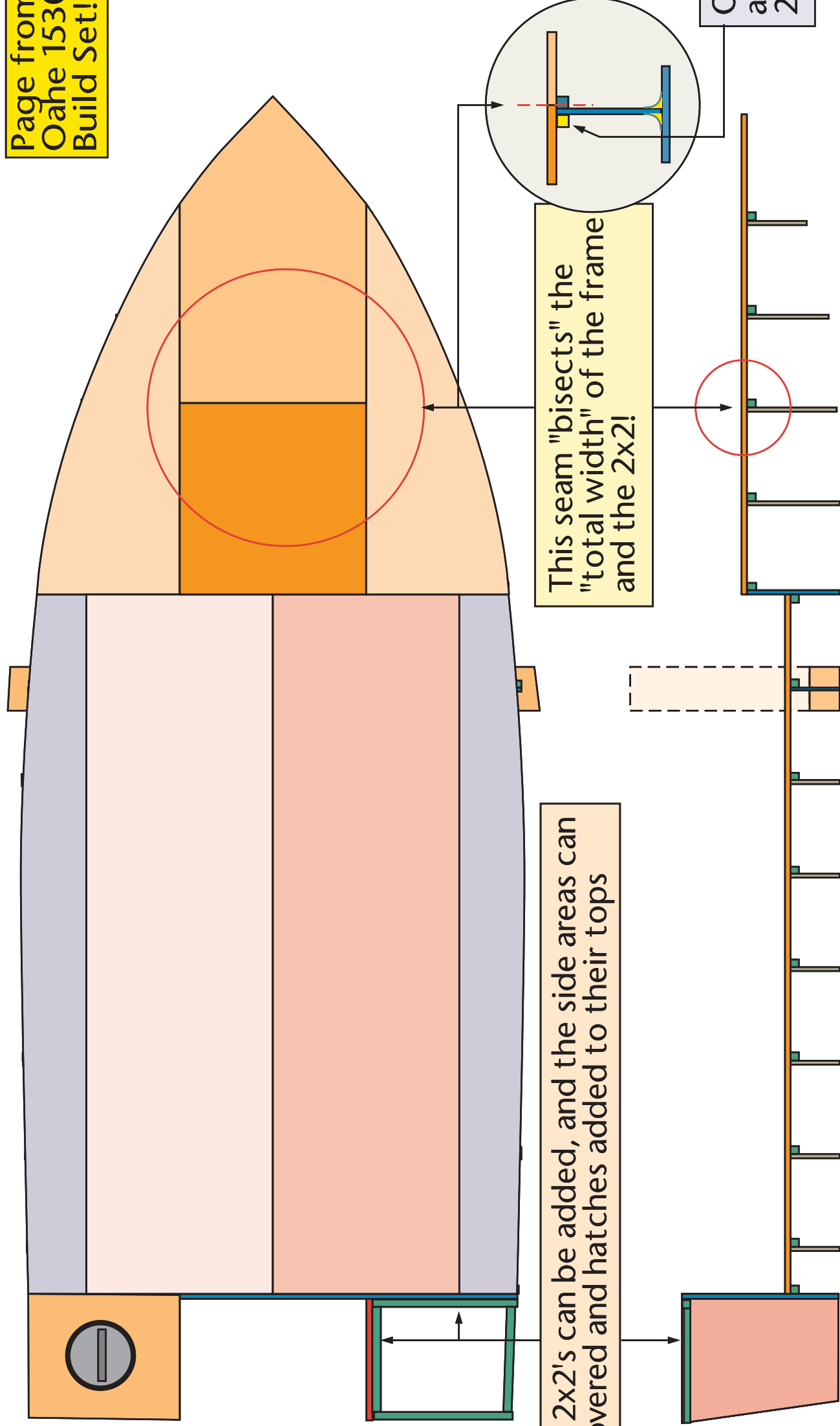
Make sure that the bow frames are either level with the hull, or rise at a slight angle so any water can drain to the rear



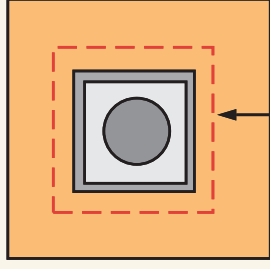
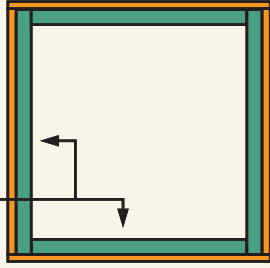
Limber holes in "all frames" for drainage!

Now that all the frames are in the hull, the "floors" can be located and temporally installed

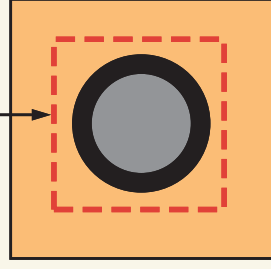
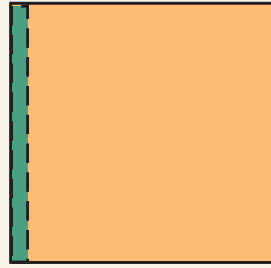
Page from the
Oahe 1530
Build Set!



2x2's to support seat top and have something to screw into

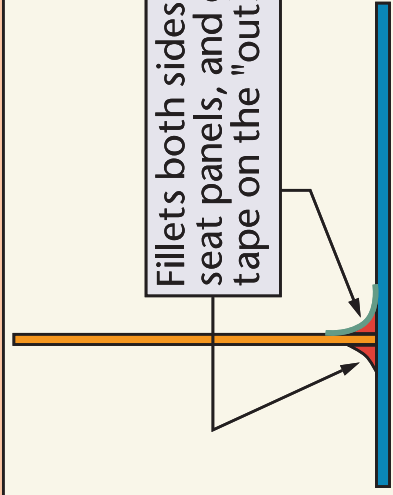


Backing plate



Side Edge Front
Hatch view of seat

The "inside fillet" is to keep water out of the joint, and to reduce the chance of rot!



Fillet both sides of all seat panels, and glass tape on the "outside"

Screw and epoxy 2x2's and frames



Details



Before installing "any" plywood in the hull, make sure that all the edges are coated with at least two coats of epoxy.



Page from the Oahe 1530 Build Set!

You may want to over bore the drain plug hole and fill it with fillet material and then fit the drain plug to that hole. That way you will have sealed off the plywood from water intrusion from around the drain fitting and keep rot from getting a foot hold in the hull!

Shape fillet material to fill in the space between the bottom of the drain plug and the hull to help drain all the water out!

Glass cloth on outside corners



Fillet inside corners and all panel seams



Floor frames can be made from solid plywood, or half splits, or even scrap that has been glassed together.

Fillet as many sides and edges as you can; this will keep water out of the seams and prevent a rot from getting a foot hold in the hull! Paint everything, and paint any areas that will be hard to get to before you cover them forever!