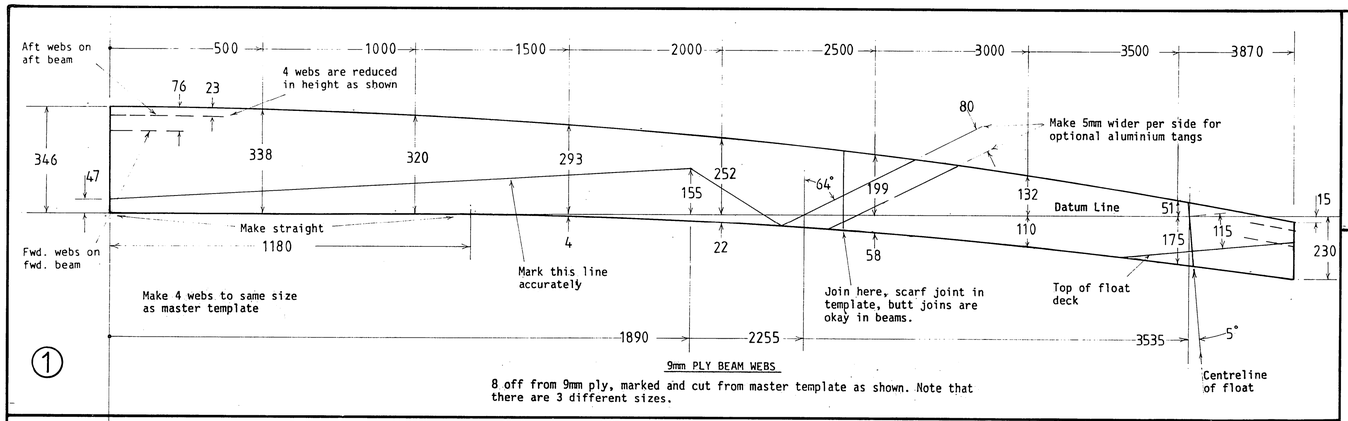
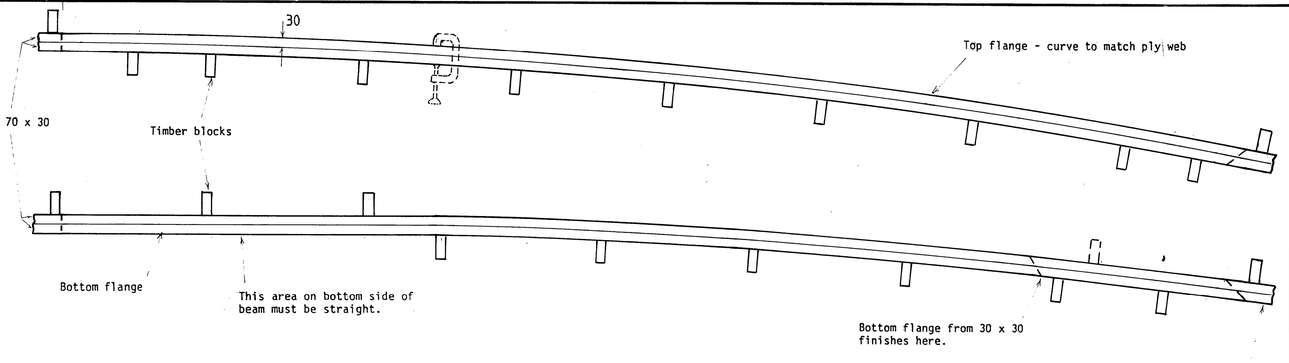


① **9mm PLY BEAM WEBS**

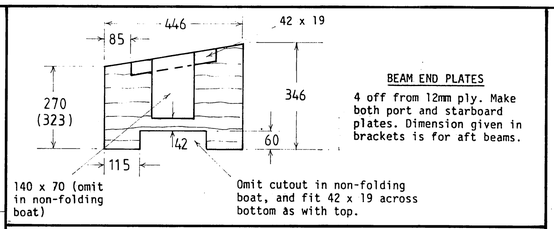
8 off from 9mm ply, marked and cut from master template as shown. Note that there are 3 different sizes.



② **TIMBER FLANGES**

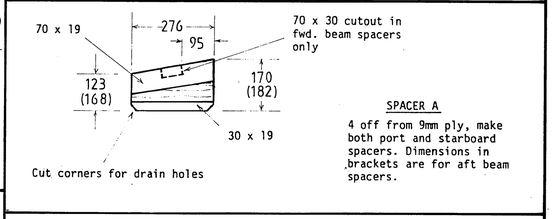
Laminate in curve to match ply webs, from 70 x 30. Make 8 top flanges, 8 bottom flanges, and another 8 bottom flanges from 30 x 30. Laminate on flat surface such as 2 sheets of ply, using timber blocks to hold flanges in the correct curve. Clamp well, no fasteners are required.

Leave flanges long and trim to size later



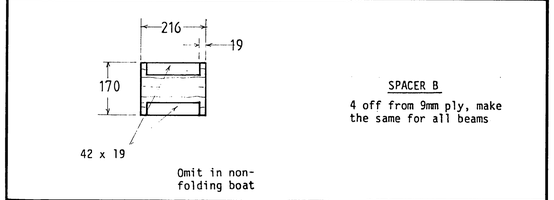
BEAM END PLATES

4 off from 12mm ply. Make both port and starboard plates. Dimension given in brackets is for aft beams.



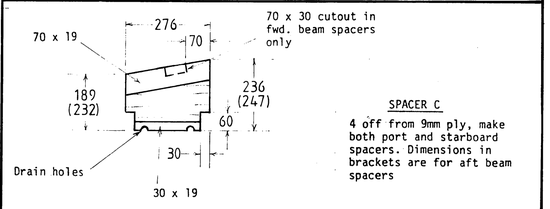
SPACER A

4 off from 9mm ply, make both port and starboard spacers. Dimensions in brackets are for aft beam spacers.



SPACER B

4 off from 9mm ply, make the same for all beams



SPACER C

4 off from 9mm ply, make both port and starboard spacers. Dimensions in brackets are for aft beam spacers

BEAM CONSTRUCTION

Upon first looking at the beam construction drawing, you may throw your hands in the air and shout help! But relax, they are really quite straight forward, just a bit boring to make. It's a good idea to make them progressivley as other construction proceeds.

To build, just start at Step 1, and work your way through to Step 5. Don't try to understand Step 5 initially, as it will become clear once you get there. Just get started, and everything will fall into place.

Select the beam timber carefully. Use only the best perfectly clear timber, free of knots and splits. It should be a good structural grade, with a density of about 530kg/cu. m. (331bs/cu.ft.) such as Oregon (Douglas fir) or Hoop pine. Ply used must be Marine grade.

Before starting, be clear in your mind about the beam shape. Familiarize yourself with the beam cross-section as shown on Sheet 8. Note they are basically rectangular with an angled top, more so on the forward beam than the aft, this angle matching the deck line. Note which way they are angled, and make them accordingly.

STEP 1. Make up master template from 9mm ply, to the measurements given, with reference lines marked as shown. Use this to mark out all the 9mm ply webs/sides and to mark or check reference lines later. Two sets of webs are made smaller than the template, their height from the datum line being reduced by amounts shown.

STEP 2. Make timber flanges by laminating 70 x 30 together (30 x 30 for the extra bottom flange). They are curved to match the curve on the top and bottom of the master template. A cheaper resorcinal glue can be used for this laminating work.

STEP 3. The flanges are now glued to the ply webs (nailed from behind), forming the beam sides. Be sure to step up or down the top flanges as shown to make fairing off easier later. Now fit the centre reinforcing pieces. Seal inside with epoxy, as described below, and finally mark accurately the float centreline and deck line, on the outside, using the master template. These are used later to position the floats.

Note the drain channels, which must not be omitted. These must always be positioned where shown, to allow any water to drain out of the beam into the float. It must not be allowed to sit in the beam. When folded, the drain holes and vents also allow good ventilation by convection (as the beam is warmed in the sun) if the inspection/vent hatch is left open.

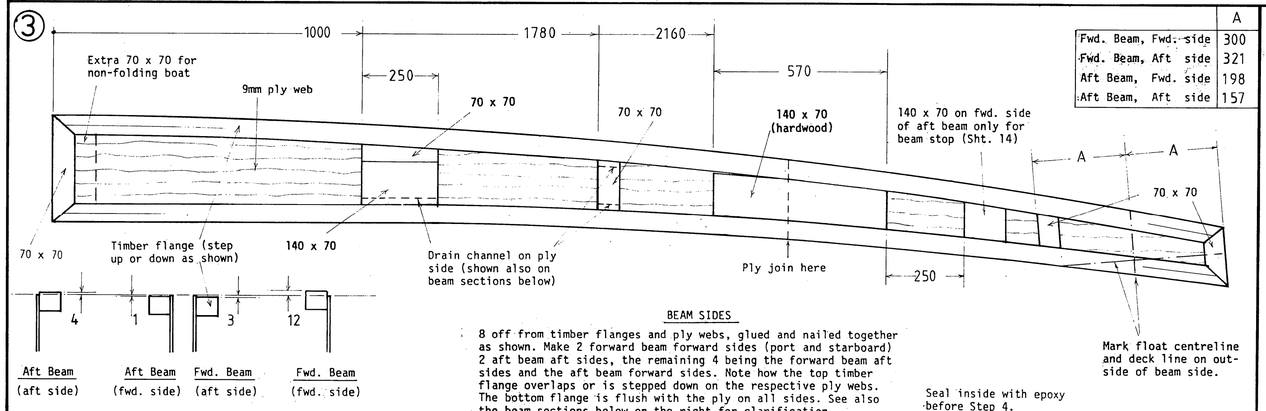
STEP 4. The inner face of the beam sides is now completed, with first the 6mm ply cover, then the various timber pieces as shown. Position the 120 x 30 carefully, using the master template to check. The 12mm ply centre web fitted on top of this later must be parallel with the beam bottom, so as to not twist the upper folding strut when the brackets are bolted down later. Again, be sure to drill drain holes where shown.

STEP 5. The beam sides are now joined together. First fit Spacers B & C to one side, and then join the two sides. Now fit 12mm ply centre web, the 90 x 30 at the beam inner end, then the beam end plate. Make sure the beam is square, both horizontally and vertically. The vertical 90 x 30s are now fitted along with Spacer A, then the 25mm ply pad and supporting wedges for same. Bottom ply is now glued in place, it being full width of the beam from float end to Spacer B, and from there a 212mm wide centre strip is cut out to the inner beam end, forming a recess for the upper folding strut. The complete beam should now be sealed with epoxy.

NON-FOLDING VERSION Same as the folding version except all the parts relating to the upper folding strut are omitted, and the bottom ply is continuous, there being no recess formed for the upper folding strut. Two beam bolts are also used at the inner end instead of one, to compensate for the loss of the upper folding strut (details on Sheet 11) See also Sht. 14.

PRESERVATION Timber beams are light, very strong, but can be susceptable to dry rot. This however can be easily prevented by good ventilation, and epoxy saturation. Ventilation is achieved by vents and inspection hatches as shown, but beams must also be epoxy saturated with a minimum of 2 coats of a good epoxy saturating resin, such as the W.E.S.T. resins. It is also recommended that a 3rd coat be given to all lower areas, where moisture may lie.

Epoxy glue is strongly recommended for all beam glueing, and be particularly sure to seal all end grain, with liberal amounts of epoxy glue or resin.

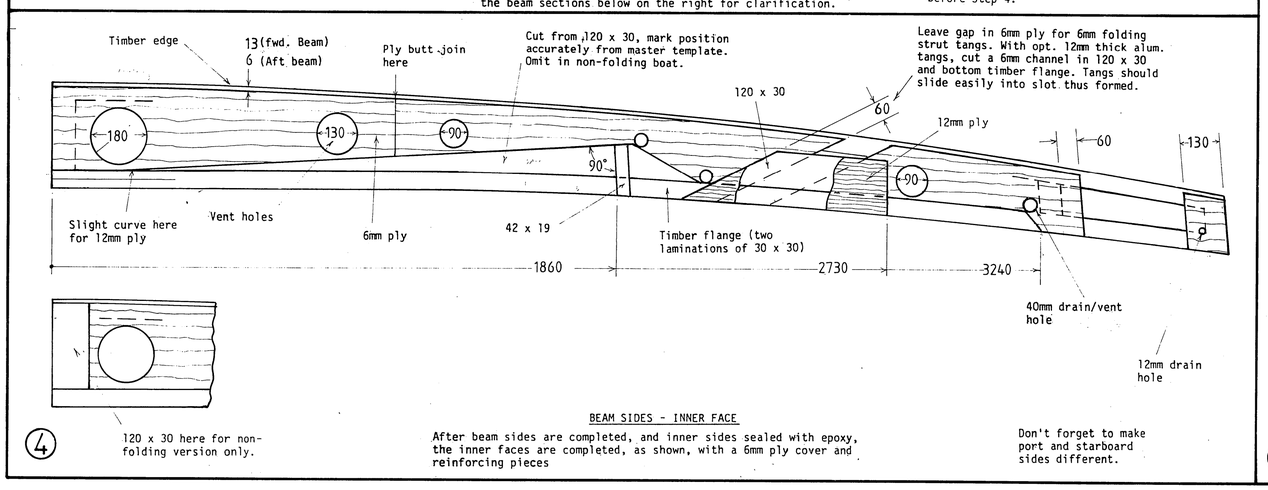


	A
Fwd. Beam, Fwd. side	300
Fwd. Beam, Aft side	321
Aft Beam, Fwd. side	198
Aft Beam, Aft side	157

③ **BEAM SIDES**

8 off from timber flanges and ply webs, glued and nailed together as shown. Make 2 forward beam forward sides (port and starboard) 2 aft beam aft sides, the remaining 4 being the forward beam aft sides and the aft beam forward sides. Note how the top timber flange overlaps or is stepped down on the respective ply webs. The bottom flange is flush with the ply on all sides. See also the beam sections below on the right for clarification.

Seal inside with epoxy before Step 4.

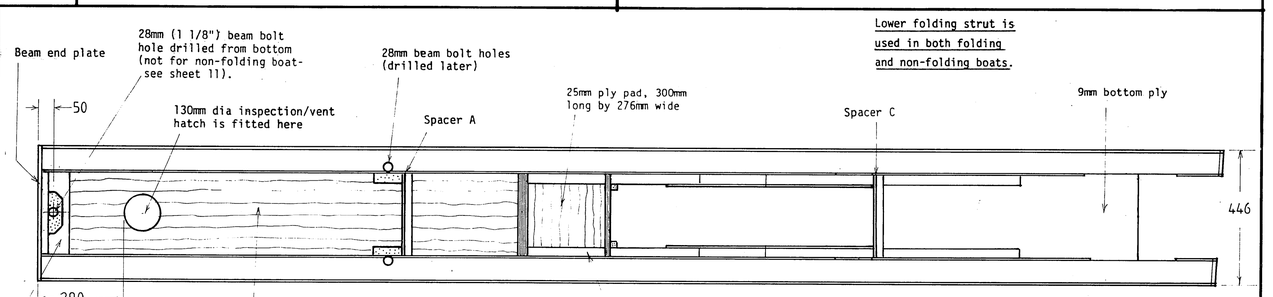


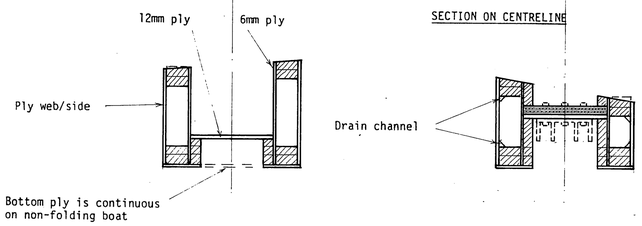
120 x 30 here for non-folding version only.

④ **BEAM SIDES - INNER FACE**

After beam sides are completed, and inner sides sealed with epoxy, the inner faces are completed, as shown, with a 6mm ply cover and reinforcing pieces

Don't forget to make port and starboard sides different.





⑤ **TYPICAL BEAM SECTION** (aft beam shown)

TYPICAL BEAM SECTION (fwd. beam shown)

BEAMS - FINAL ASSEMBLY

The beam sides are joined together with the end plate, 12mm ply, and spacers etc. The beams are now ready for final assembly in the boat.

SCALE 1 : 10

J. Hawkins. 20/5/82.

COMMAND 10

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BEAM CONSTRUCTION

SHEET No. 6