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Duckworks Magazine

Design contest 2001

I enclose an entry for the Duckworks 2001 Amateur Design Competition . I have read and understood the competition rules and agree to be bound by them .

I am an architect (not naval), fifty five years old and live in France in Burgundy .

I have designed and build for myself several boats from 8 to 24 feet all made of wood, ply or cold laminated veneer .

Project's name :

ALIEN III



INTENDED USE

My basic need is for a kind of tender to my "yacht" .

We own a 20 ft daysailer which is moored at about 100yd of the shore in front of our summer house in Brittany .

There is always a lot of things to carry to and from this boat : people, gas, water, batteries, tools, anchors, chain, food, fishing equipment and so on ...

Actually i am using an inflatable 6 ft tender . Hard to keep yourself dry in such a bathtub .

Many peoples are using 7-8ft plastic prams, some of them are fitted with wheels . The beach is invaded by this coloured buckets . It is an offense to the landscape .

I had decided to build a classic 12 ft dory when i discovered Duckworks design contest .

Then i decided to adapt my project to the competition's rules without forgetting my personal needs .

I want a boat :

- Not too heavy, it has to be hauled on the beach
- Not too short, 10 ft is a minimum for a good weight carrying capacity and a correct stability
- Either rowed or sailed
- Fast and easy to rig
- Able to sail with two people aboard
- With good overall sailing performances, particularly by light weather and to windward (we have to overcome strong tidal streams)
- Easy to build and maintain
- Looking like a boat, neither a bucket nor a container

It will be used as a tender but also for fishing and fun in sheltered water by adults and teenagers.

DESIGN

Some preliminary sketches led me to the conclusion that with two 8x4 sheets :

- The boat could be 10-11 ft long at the price of some scarfing
- Width could be a bit more than 4 ft which is good, not too wide, not too slim
- A two chines configuration with a flat bottom and a forward transom lead to less curved panel's development allowing a better use of the ply

The final project was elaborated with my favorite CAD program (Tubocad), optimised and very accurately drawn to avoid the job of full size lofting .

Once the definitive line plan drawn, hull's panels were decomposed into triangles to do the development . Tests showed that the accuracy is better than 2/100" on overall dimensions .

A virtual 3D model was built with Tubocad also . It showed well faired lines and good overall proportions .

Finally a 1/10th cardboard model was built directly from the printed development of the planking as a final check .

Longitudinal lines are smooth to keep a good heeled balance.

The sections show a narrow waterline for a low wetted area and ease of rowing . Initial stability is moderate but a few degrees heel increases the beam to leeward making the boat stiffer .

The rig is a kind of sail board's rig for efficiency and simplicity . No shrouds, no halyard, no boom, just a wishbone two blocks and a sheet . The boat will be rigged on the shore, sail and wishbone being lashed to the mast . The leech of the sail is straight because i suppose it must be so with Poly tarp . (A sail made of cloth could have a rounded leech with two battens allowing an increased sail area) . The wishbone's trajectory is above the crew's heads .

CONSTRUCTION

Stitch and glue was chosen for simplicity and economy .

Full size patterns of the panels can be plotted directly from the CAD files and put on the ply sheets to cut the parts .

The more accurate job to do is scarfing the 5 hull's panels .

The panels are joined by glass taped fillets .

The bottom is reinforced by an inside keel and two bottom stringers .

An external and internal gunwale with spacers add stiffness to the sides .

The structure is completed by the mast beam and the seat .

Every part must be screwed and glued .

The mast is a rounded box section build of four glued parts .

The whisbone is made of two parts glued , bent and lashed together .

One polytarp is used for the sail . A cover could be made with the other .

Every bit of plywood and timber is used with very few losses .

FASTENERS

Resin : One gallon epoxy is more than enough for gluing, filletting and coating all wooden parts .

Fillers : microsphere for fillets, wood fiber for gluing, talc or similar for fairing .

Glass tape : 4 inch woven cloth or biaxial, about 40 yard

Screws : stainless steel or bronze 3/4" - 200 , 1 1/2" - 60

Steel nails and screws : for temporary fastening

Polyurethan paint and/or varnish :

Carpet tape : for the sail about 15 yard (one seam has to be taped and sewed)

Miscellaneous : adhesive paper, solvent, sanding paper, ...

FITTINGS

Two blocks for the main sheet .

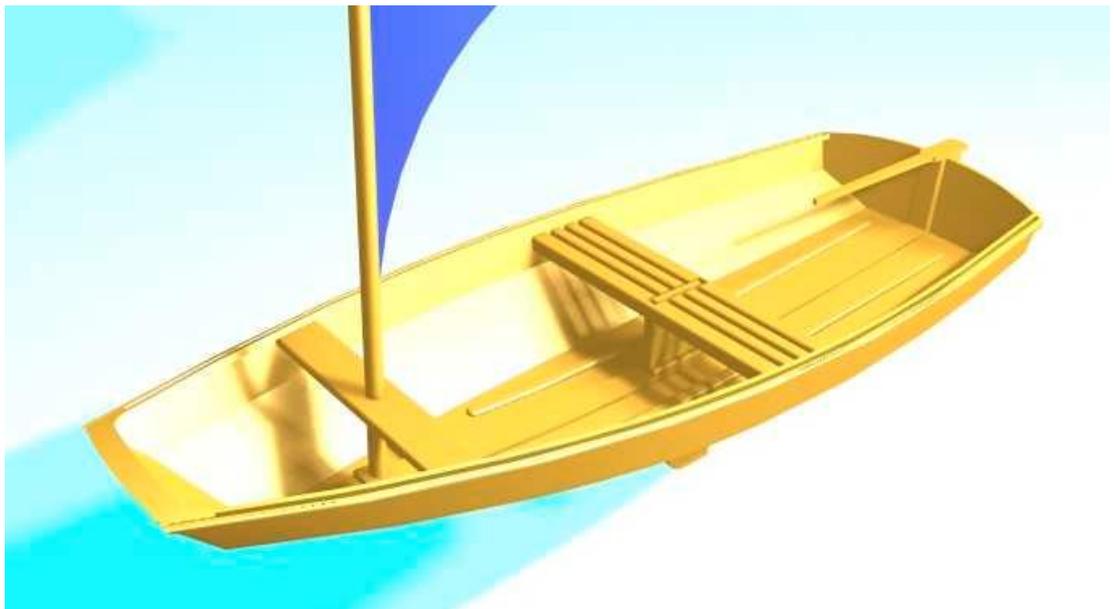
Rudder fixture .

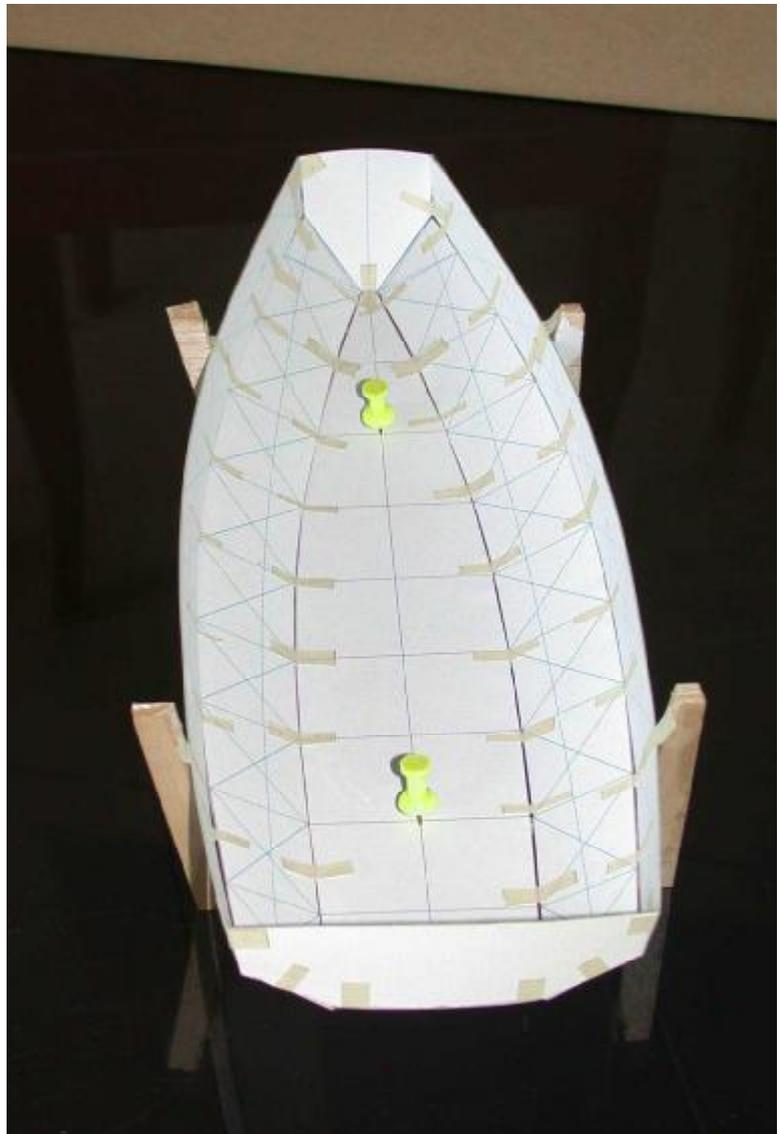
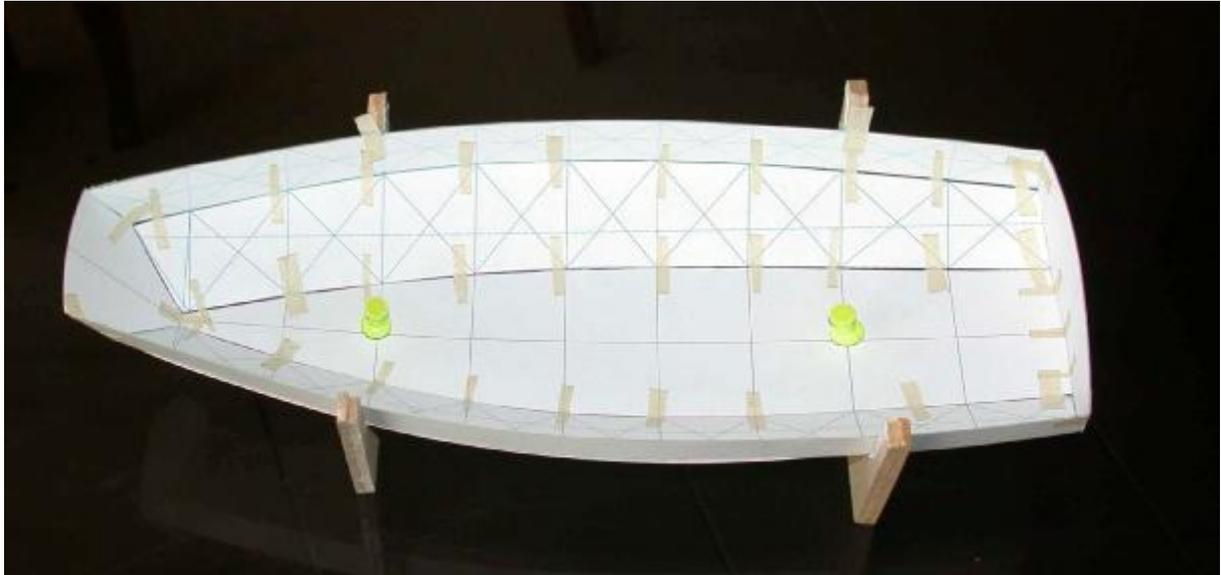
SPECIFICATIONS

LOA :	127.0 "
LWL :	115.0 "
BOA :	49.0 "
BWL :	35.9 "
Draft :	4.2 "
Max freeboard :	13.4 "
Min freeboard :	9.8 "
Displacement :	310 lbs
Sail area :	54.3 sq ft
Empty weight :	110 lbs

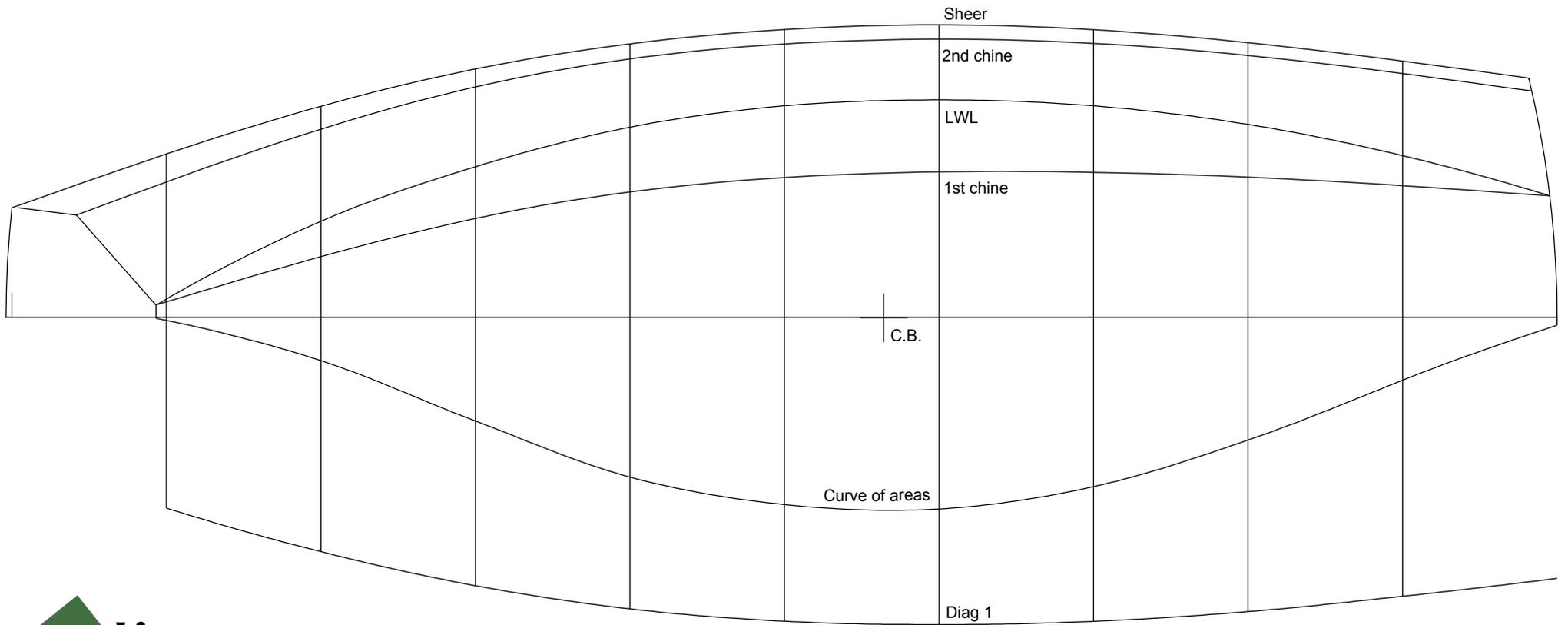
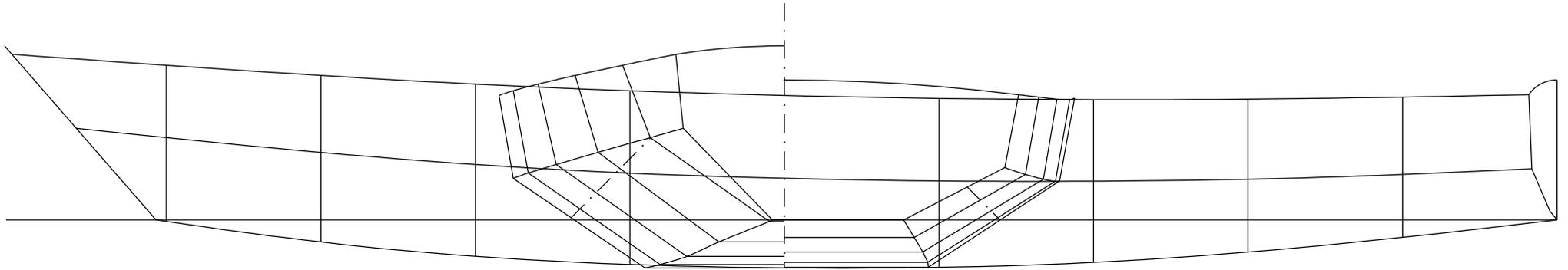


A virtual model





The card board model is wired and put in the jigs, ready for filletting .



Lines

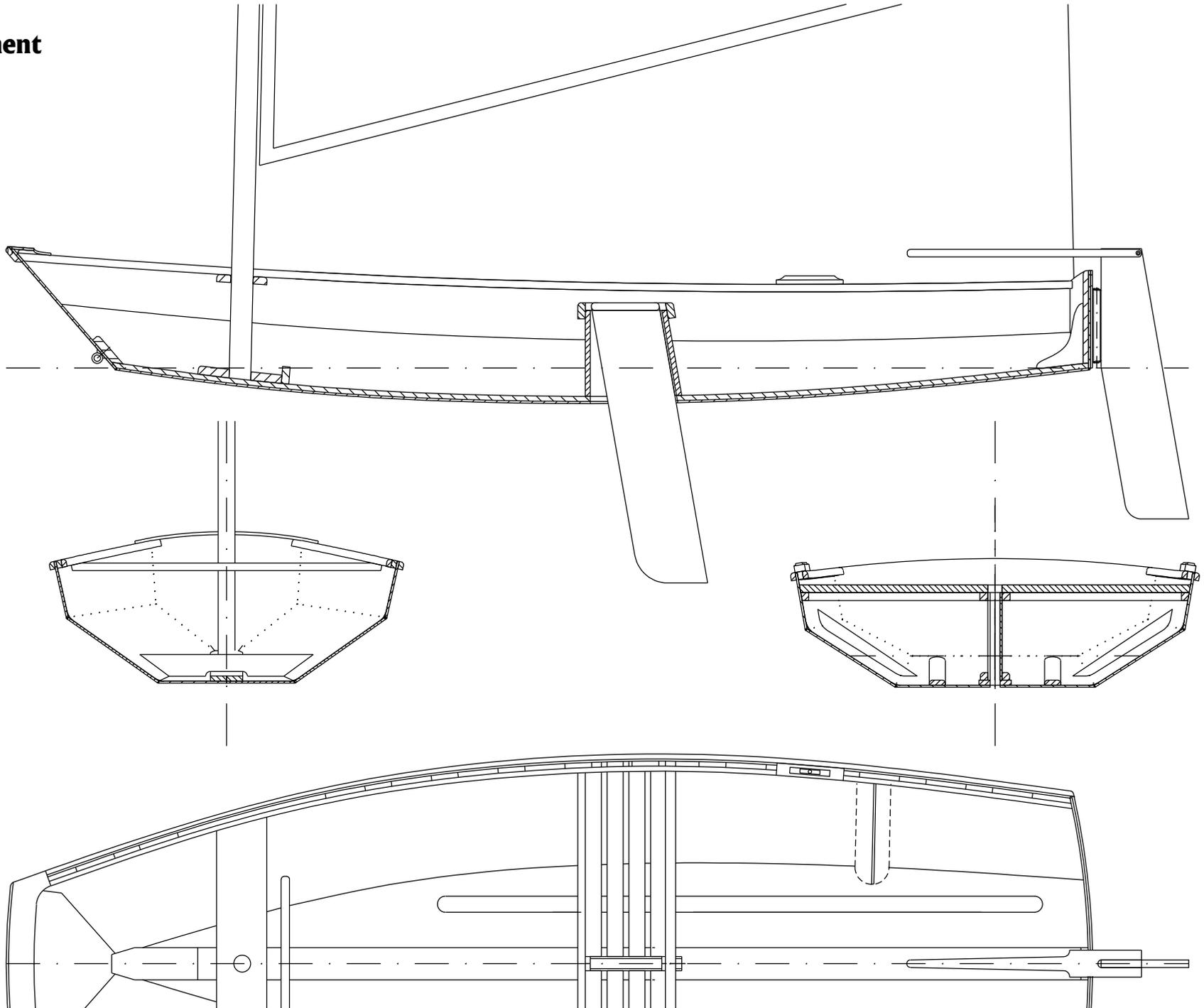
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Inside planking (add 1/4")



Arrangement

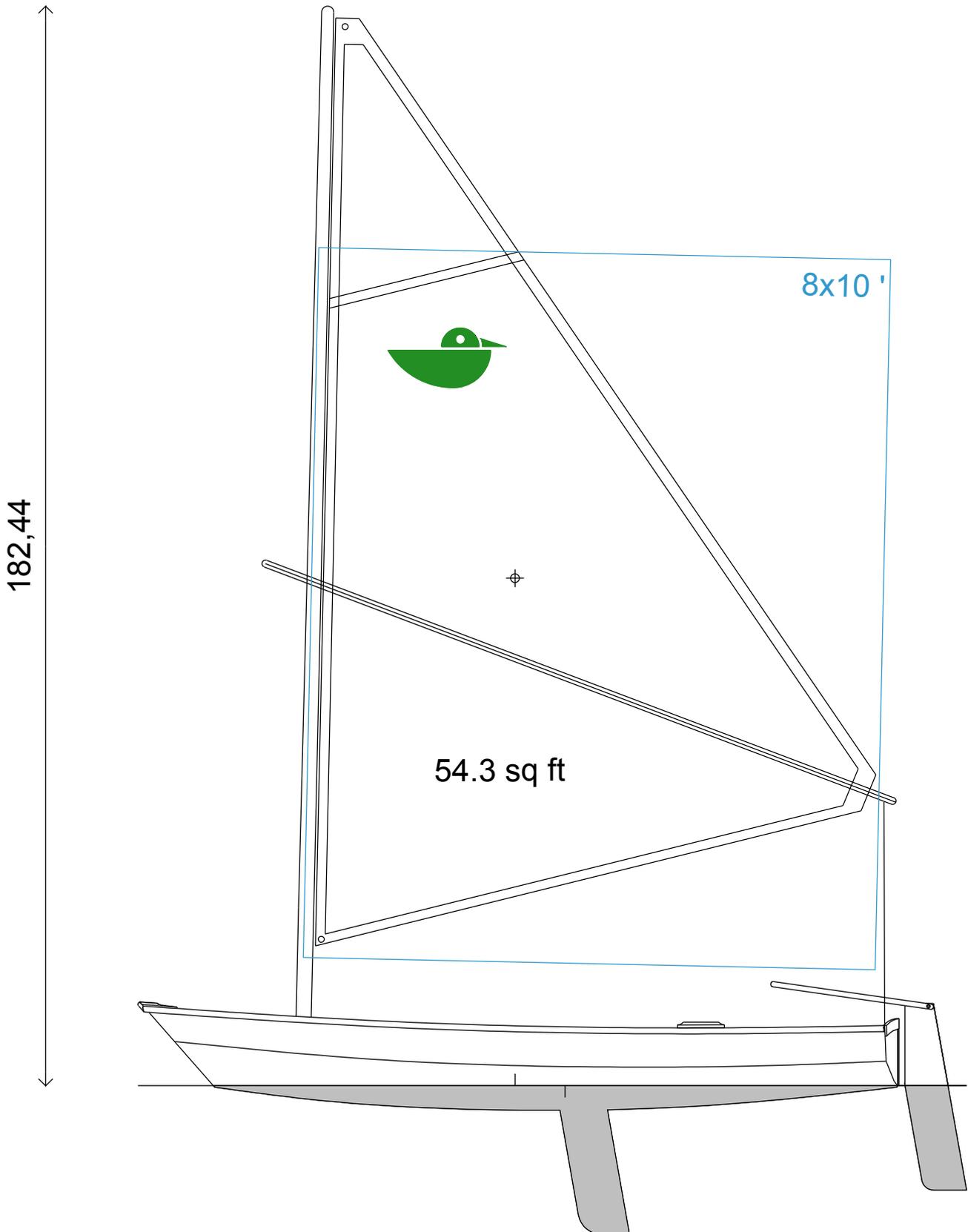
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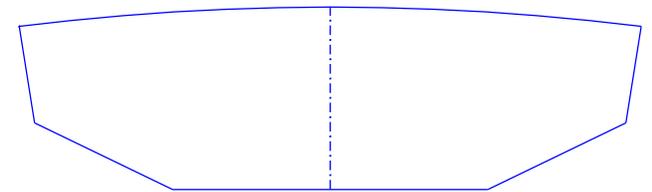
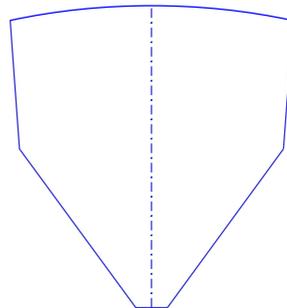
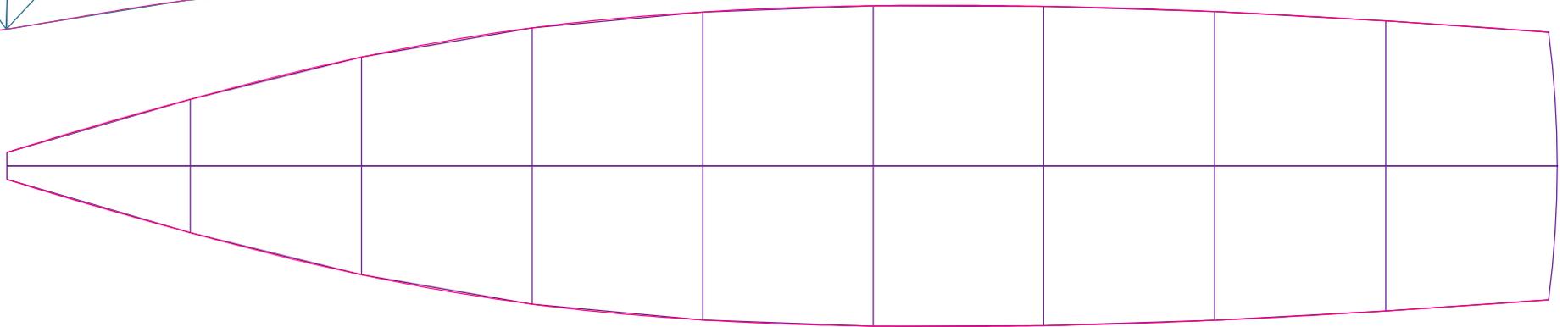
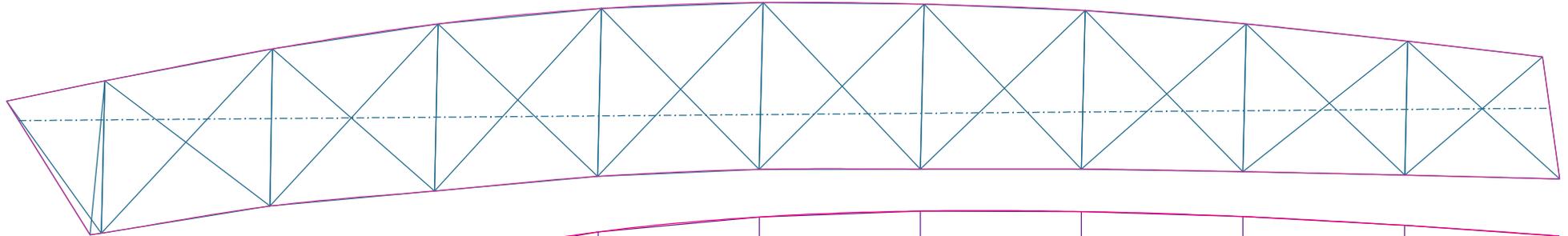
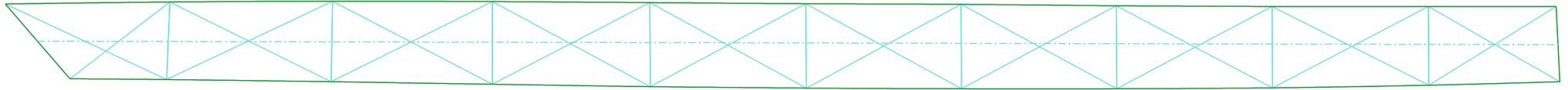




Sail plan

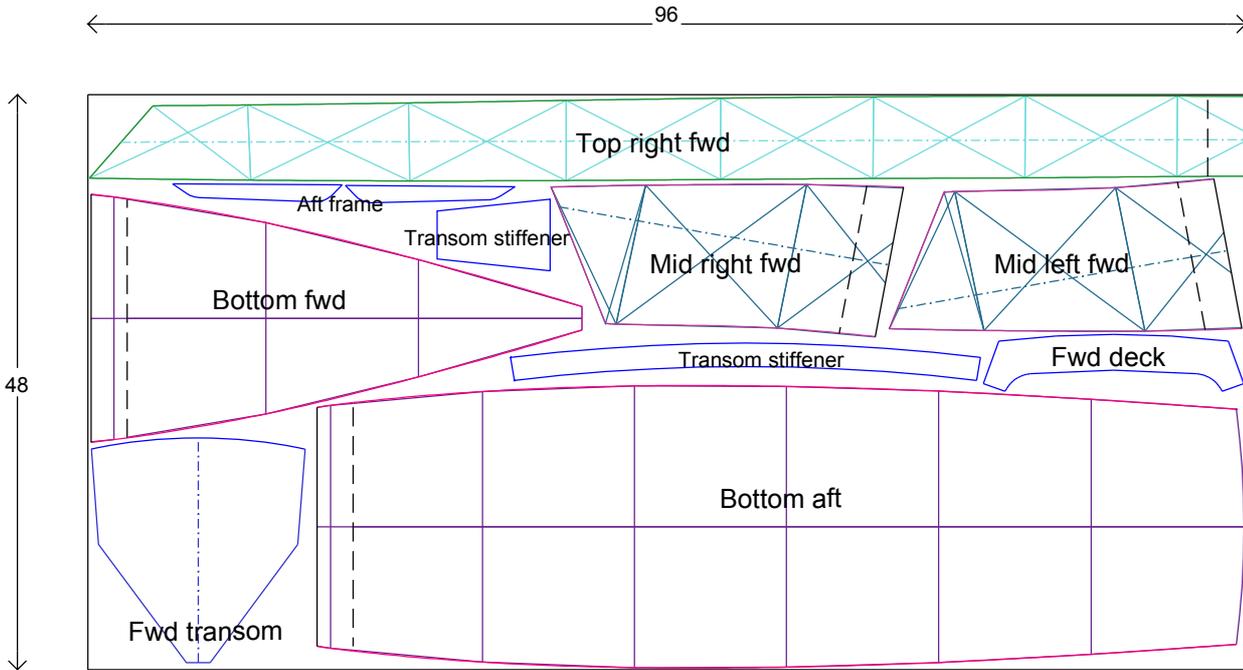
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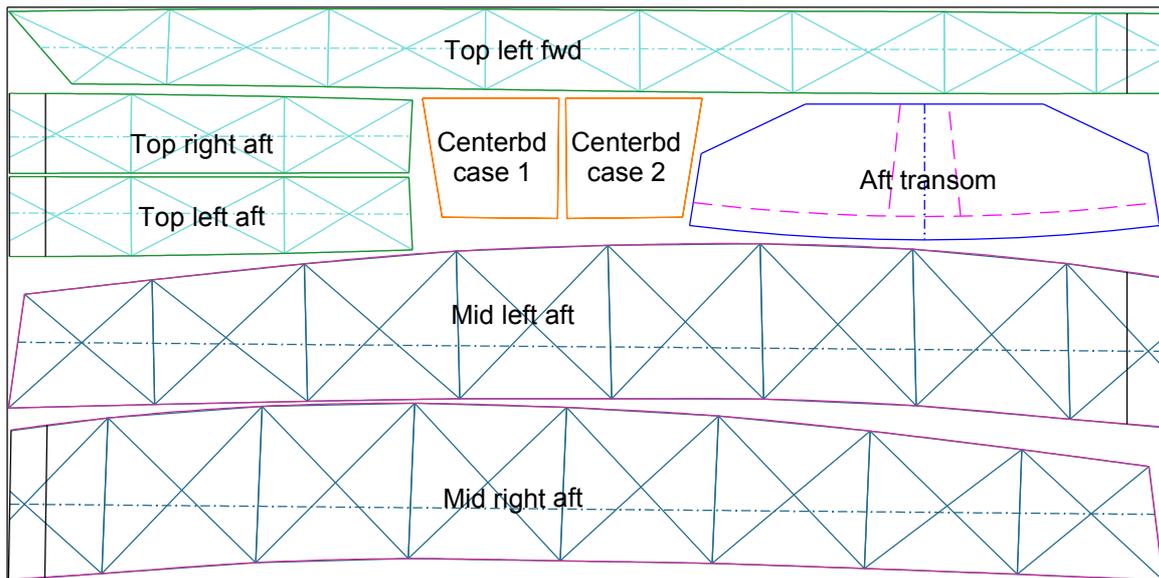


Development of the hull

Scale : 1/12



First sheet



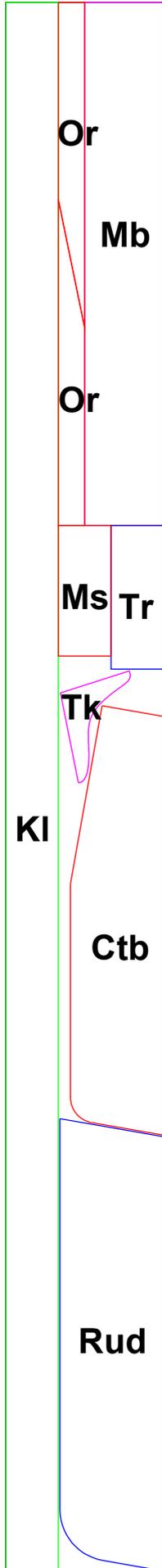
Second sheet

A minimum distance of 1/4" around the sheets and 1/4" between parts has been kept

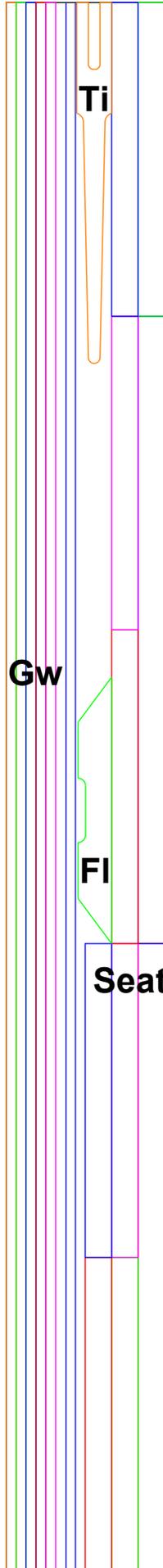


Use of timber

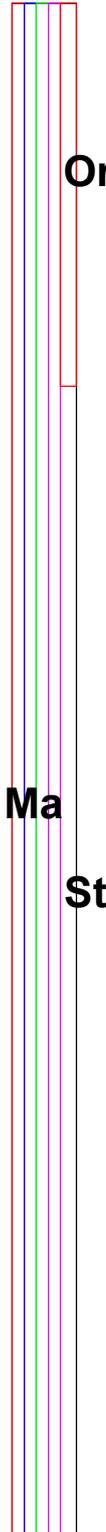
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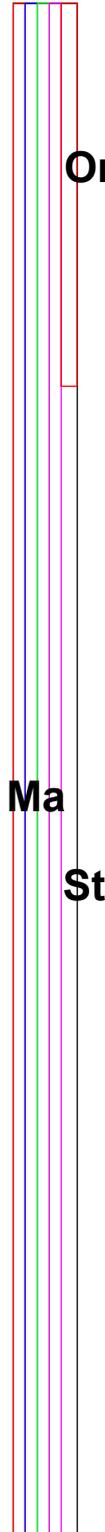
12x1



12x1



2x4

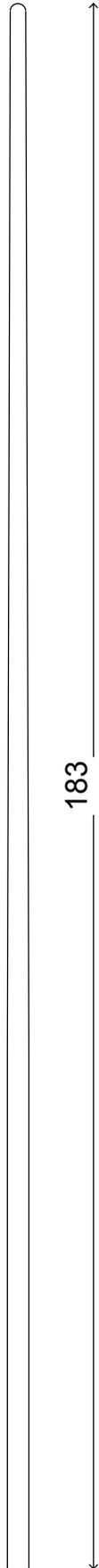
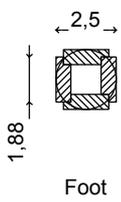
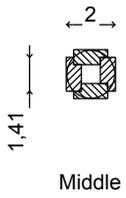
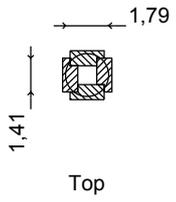


2x4

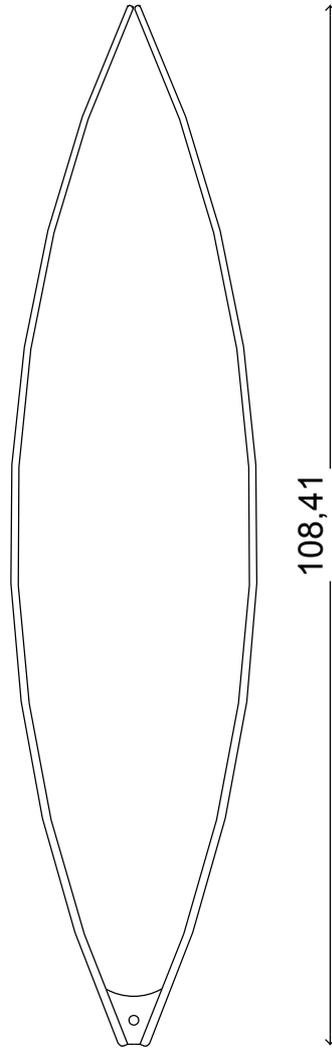
KI	Keel
Rud	Rudder
Ctb	Centerboard
Tk	Transom knee
Tr	Transom reinf.
Ms	Mast step
Mb	Mast beam
Or	Oar
Gw	Gunwale
Ti	Tiller
FI	Floor
Seat	Seat
Ma	Mast
St	Stringer



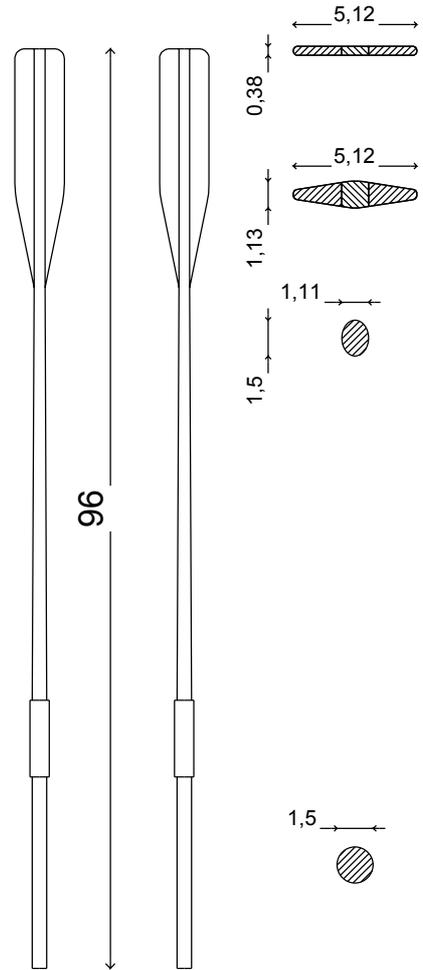
Spars
Scale : 1/24



Mast



Whishbone



Oars