

CARAVELA 1.7



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How to Build the Dinghy Caravela

To build a Caravela is similar to assembling a jigsaw puzzle. All it's required is to follow the instructions contained in this building manual.

1 – The building components

- 1 – 1 – Bottom panels – (marine plywood – 4 mm)
- 1 – 2 – Bilge panels – (marine plywood 4 mm)
- 1 – 2 – Topside panels – (marine plywood 4 mm)
- 1 – 3 – 1 – Leeboard case panels (marine plywood – 4 mm)
- 1 – 4 – Fore transom – (marine plywood – 4 mm)
- 1 – 5 – Foc'sl bulkhead (marine plywood 4 mm)
- 1 – 6 – Midsection bulkhead (marine plywood 4 mm)
- 1 – 7 - Stern transom (marine plywood 4 mm)
- 1 – 8 – Longitudinal bulkheads (marine plywood 4 mm)
- 1 – 9 – Keelson (lumber 18mm)
- 1 – 10 – Deck (marine plywood 4mm)
- 1 – 11 – Cockpit floorboard (marine plywood 4mm)

2 - Making the various components at the work bench

- 2 – 1 – Using the quotations contained in the plans, the builder will be able to draw correctly all full size panels. To draw the curved lines use a flexible batten passing by the dots that control the curves.
- 2 – 2 – Once drawn, cut the plywood following the lines. Plane or sand the cut edges to produce a clean finishing.
- 2 – 3 – Where there are notches, sand its three sides, using for that purpose a sandpaper backed by a 3mm plywood straight edge.

3 – How to assemble the hull

- 3 – 1 – Draw a 6 mm internal parallel line to each edge of the panels. Make a 1,5 mm hole at each corner of these lines. In one of the panels that is going to be joined to another, make a hole 15mm apart from the first one and from then on, make holes at each 30 mm along the line. On the other panel, after the hole made at the corner, continue making holes at each 30 mm along the line.
- 3 – 2 – With a nylon thread and a thick needle, sew the bottom panels to the intermediate ones, and these to the side panels and transom.

3 – 3 – Once the hull is stitched, turn the dinghy upside, make an epoxy putty adding micro sphere as a filler until this becomes the consistency of mayonnaise. You can add aerosil up to the proportion of 20% of the micro sphere, to increase the filler viscosity. Apply this putty to the internal edges of the chines with a round edge spatula with 25 mm radius. The putty should cover stitches and the holes that were made.

3 – 4 – Once the putty is cured, turn the dinghy upside down and apply a 80mm wide 200g/m² fibreglass tape on each chine of the dinghy. Saturate the glass cloth with epoxy resin. Following, apply one layer of 100g/m² glass cloth over the entire hull. After curing, sand thoroughly this encapsulation. At this stage the dinghy is already solid enough to be handled with safety.

4 – Building the internal structure

4 – 1 – The first pieces to be installed are the foc'sle bulkhead and the midsection bulkhead. Mark with a pencil in the internal side of the hull the exact position of these two bulkheads.

4 – 2 – Adjust them carefully so they fit into their correct positions. Round the corners that touch the edges, with a radius a bit larger than the filleted chines, so that bulkhead edges touch the hull continuously. Once these bulkheads are attached, fillet them against the hull, in the same way as was explained for the internal chines. Fillet up to the slot where the sheer clamp will be fitted, leaving this slot open.

4 – 3 – Glue the 18 mm x 18 mm supporting cleats shown in sheets 9 and 10. Glue the equivalent supports on the transom. To help fix these supports until the glue hardens, you can use 16mm (5/8") s. s. self tapping flat head screws, screwed from the plywood to the wood. You can also use clamps to press the two parts till the glue cures. The excess glue can be removed with a spatula and the stained surface cleaned with a cloth wet in alcohol.

4 – 4 – Install the keelson in its place gluing it to foc'sle bulkhead, bottom panel and stern transom. The keelson should fit into the mid section bulkhead by means of two half notches, one in each component. Fillet the keelson at both sides to the bottom panel.

5 – Building and installing the lee cases

Before fixing the deck in place, the leeboard cases must be installed

5.1 – Draw two vertical lines on each topside, one of them 607 mm ahead of the after transom, and the other one 186 mm forwards.

5.2 – Build two boxes open in its upper and lower sides, using rectangular 4 mm plywood panels for their sides and 18 mm x 18 mm cleats to close them.

5.3 – Laminate a layer of 100g/m² glass cloth at the inner faces of these panels.

5.4 – Once the laminations are cured, sand their surfaces and apply the same coats of paint that will be applied on the whole hull. Cover with masking tape two 18 mm wide belts at each extremity of the panels where the 18 mm x 18 mm cleats will be glued to join the boxes two side walls.

5.5 – Assemble the boxes screwing and gluing the two pairs of panels to the 18 mm x 18 mm cleats.

5.6 – Turn the dinghy side ways leaving one topside facing up. Apply an epoxy putty (can be a home made putty, adding microsphere or wood fine grain saw-dust, preferably collected from a sander dust bag, to the epoxy resin). Apply this putty on the area where the case will be placed,

and on the contact face of the case with the topside. It's advisable to protect with masking tape the outside border of the attaching place.

5.7 – Place the first case precisely in its position, which is easily recognised by the masking tapes placed outside the border lines. Hold the case in place, employing a pair of large quick action clamps to allow them to reach about half the height of the cases. Insert a 17 mm thick cleat inside the slot, so the clamp that will hold the case in place doesn't bend the outside wall when the pressure is applied. Fix the first clamp in the area where the dinghy's beam is maximum. Fix the other clamp at the fore extremity. Considering epoxy doesn't require excessive pressure to hold the glued parts in place, apply pressure gently to join the case to the topside, keeping the case outside parallel to the dinghy's centreline, taking care that the putty in excess is spilled all over the edges. Remove with a spatula this excess, and remove the masking tape before the putty sets. When the putty is cured, remove the clamps and the cleat placed to resist the compression of the clamp and turn the dinghy to the other side to attach the other case.

5.8 – Fillet the intersection of topsides with cases, with the radius indicated in cross section AA''drawing. Round the external edges and encapsulate with 100g/m² glass cloth both cases surpassing the cloth about 50 mm fore and aft beyond the fillets. Sand this lamination and the hull is ready for painting.

6 – Fitting the keel and the two lateral supports

6.1 – The keel is built in two cold moulded 18 mm x 9 mm layers. The first one is screwed and glued over the bottom centre line with the dinghy upside down. The second 18 mm x 19 mm batten is screwed and glued over the first one.

6.2 – Aft the midsection, a triangular shaped timber is glued over the laminated keel making a sort of a skeg. This is reinforced by two triangular shaped 4 mm marine plywood panels that are glued at each side increasing the total thickness of keel and skeg aft the midsection to 26 mm.

At the rear end, make a notch with the jigsaw to hold the small wheel held by two flat bars bolted to the skeg.

6.3 – The two lateral supports are also laminated on the bottom employing the same 18 mm x 9 mm battens.

6.4 – Fillet the intersection of these three reinforcements with the bottom and then apply a secondary lamination using a 100g/m² glass cloth overlapping by about 50 mm the basic hull lamination.

7 - Installing the deck and the cockpit floor board.

7 – 1 – The first pieces to be installed are the two sheer clamps. First prepare two 18mm x 9mm wooden strips with the necessary length. Laminate these strips against the sheers passing through the notches opened in the bulkheads top corners. Press them against the topsides with small clamps until the glue dries. Attach the cleats that join transoms to deck. Where the topsides aren't vertical, bevel the excess wood till the upper sides become horizontal transversely.

7 – 2 – Before installing the deck , apply two coats of epoxy inside the compartments that will be closed. Don't forget to apply epoxy at the underside of the deck panel. Apply glue to the contact surface and fasten it to the structure. Use the same s. s. self tapping screws already recommended. Proceed in the same manner for the cockpit floorboards.

8 – Finishing and painting the superstructure

Fillet with a 5 mm radius spatula the internal edges of the cockpit. Round the edges of the cockpit seats. Apply a 100mm/m² cloth saturated in epoxy all over the super-structure. Sand the surface, apply an epoxy primer, sand again and the deck will to be ready to receive the finishing touches.

9 – Finishing the dinghy.

After removing dust and other contaminants from the surface to be painted, using for this purpose a cloth dampened with thinner, apply an epoxy primer all over the hull. Sand thoroughly with dry and wet sandpaper. If necessary apply putty where you find imperfections and sand once more. At this stage the hull is ready to receive the finishing coat of paint.

10 – Installing the fittings.

10 – 1 - Inspection ports “Deck Plate” type. You can install up to three of these. Use a large size (6 inches). Put one in each lateral compartment and one in the forecastle.

10– 2 – Install a brake water. This can be customised to taste. We suggest gluing over the deck two cleats joined at centreline in a V shape.

10 – 3 – Mast carling at deck. Under the deck , abaft the foc'sle bulkhead, it's glued a wooden reinforcement 18 mm thick. Only after this reinforcement is installed, drill the carling hole. The mast step is a wooden block with a hole that coincides with mast carling.

10 – 4 - Cockpit seats – These can be removed and are slipped into slots between cleats fixed to these walls

10– 5 – Self draining plugs installed in the cockpit transom.

10 – 6 – Stainless steel pad eye for towing the dinghy

10 – 7 – Rudder fittings installed at the transom

10 – 8 – Wheel fixed to the skeg for transportation on ground.

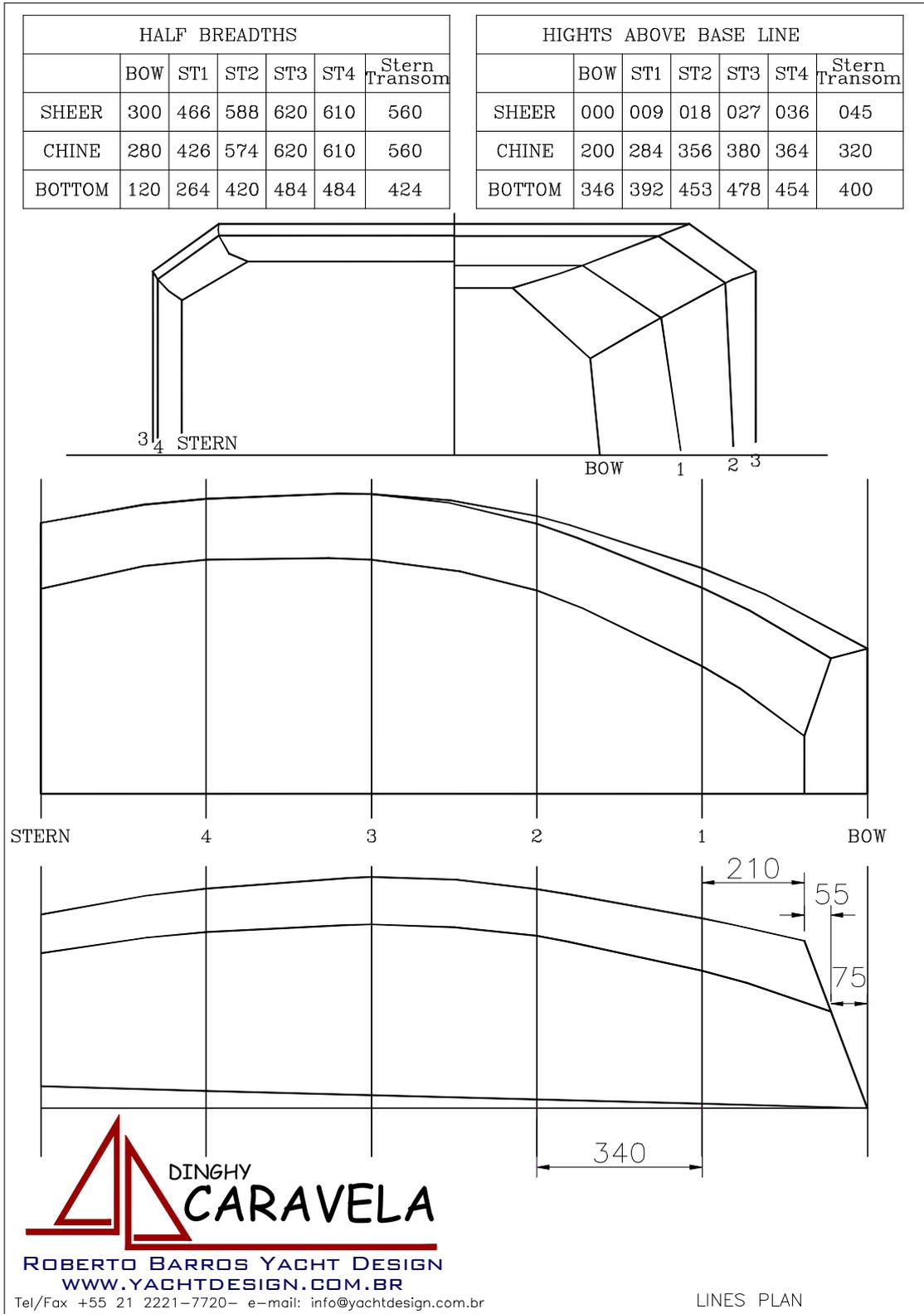
11 – Lee boards, rudder and tiller

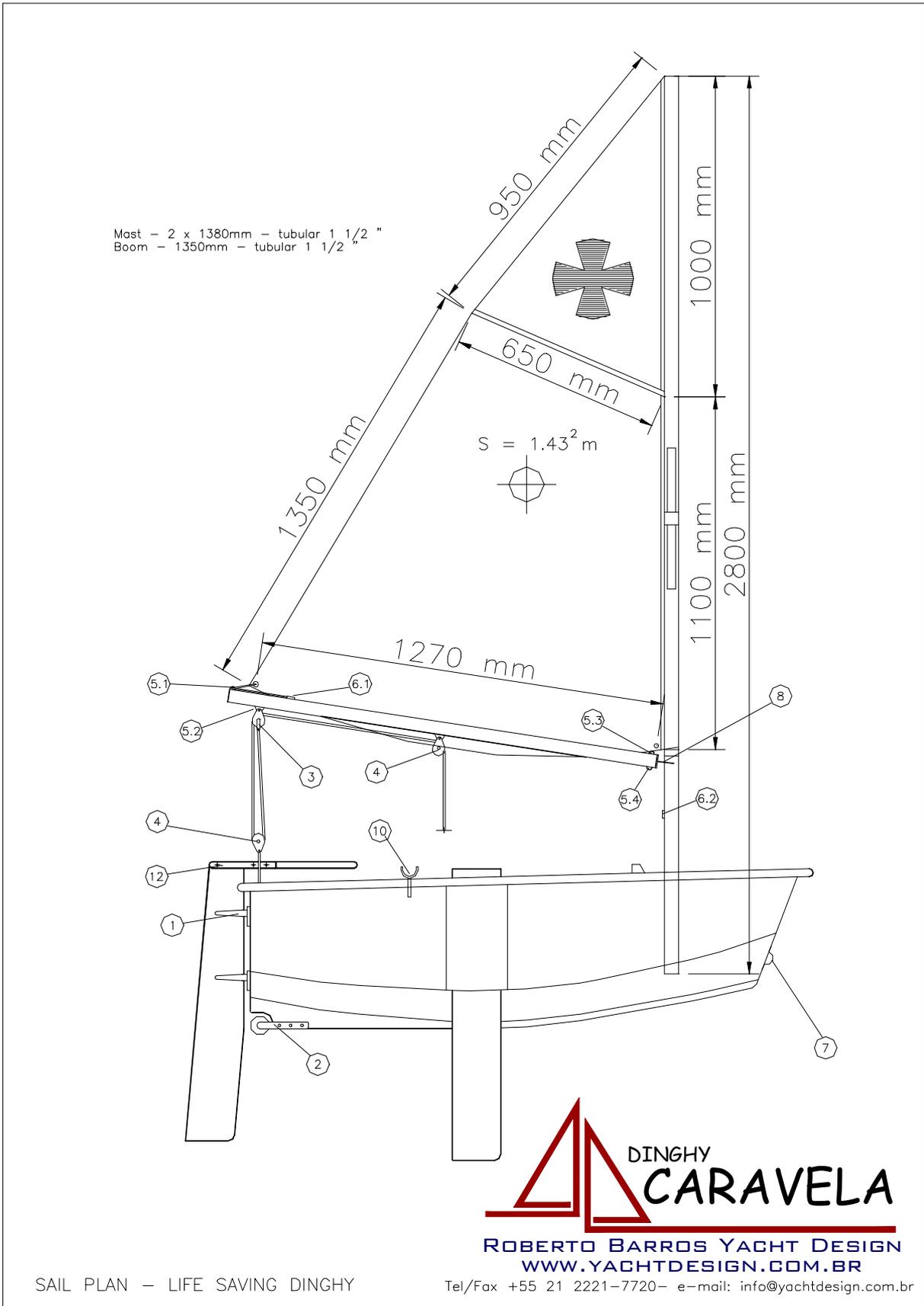
These components are built according to plans and don't require to be fibreglass covered . They can be varnished or painted. We recommend employing a hard wood for their construction.

12 – List of fittings

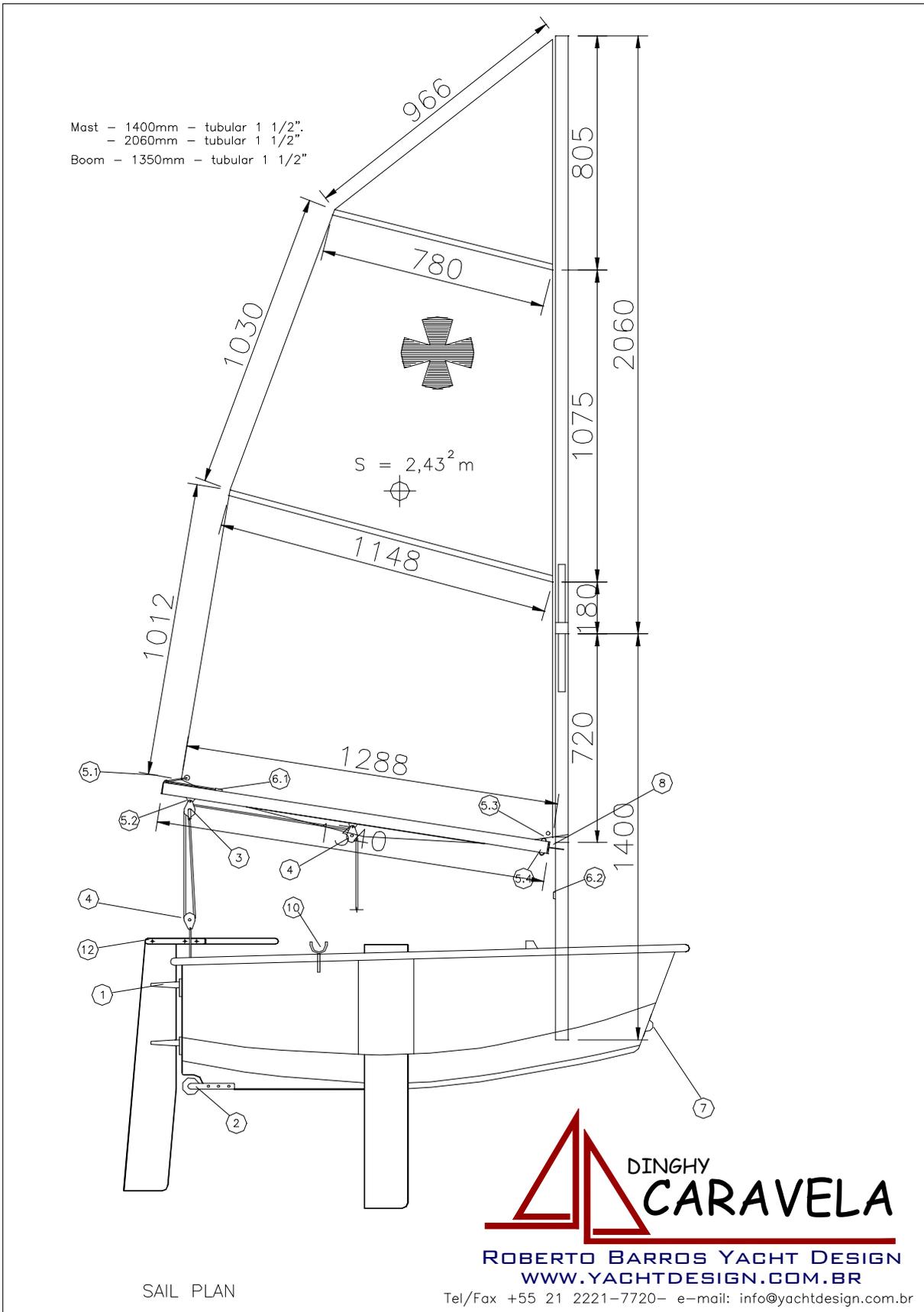
- 1 – Rudder gudgeons and pintles
- 2 – Wheel with two fixing bars.
- 3 – Single block with becket
- 4 – Single block
- 5 – Eye Straps
- 5 – 1 – Outhaul
- 5 – 2 – Sheet block.
- 5 – 3 – Foot block
- 5 – 4 – Cunningham
- 6 – Closed clam cleats
- 6 – 1 – Outhaul
- 6 – 2 – Headsail tension
- 7 – Pad eye for towing
- 8 – Goose neck
- 9 – Three deck plates
- 10 – Two rowlocks
- 10 - Two drain plugs
- 11 - Tiller and tiller bars

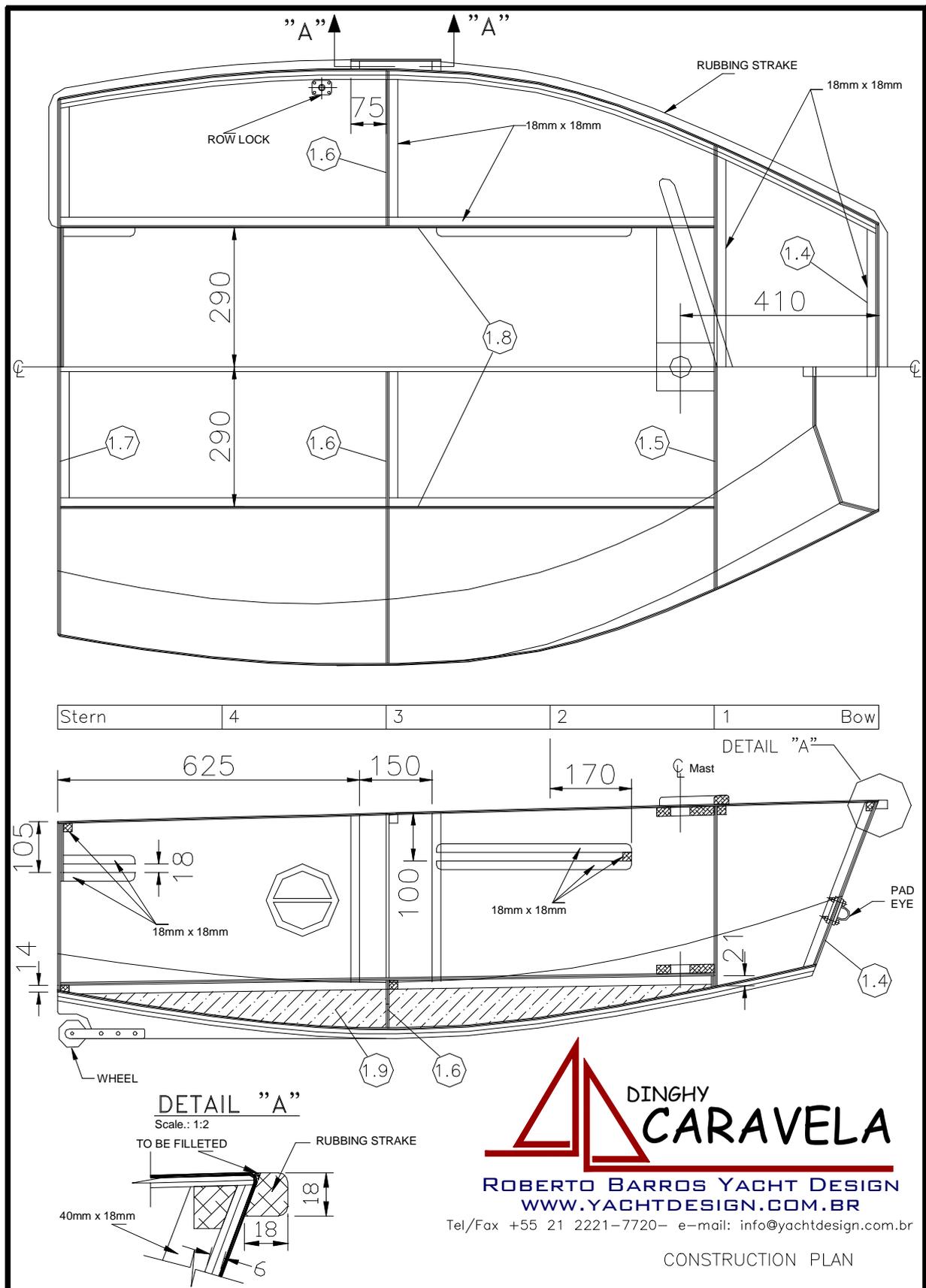


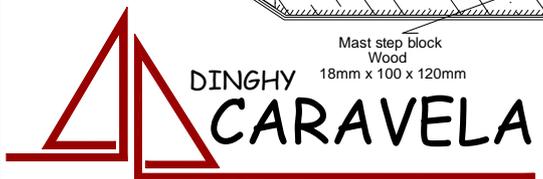
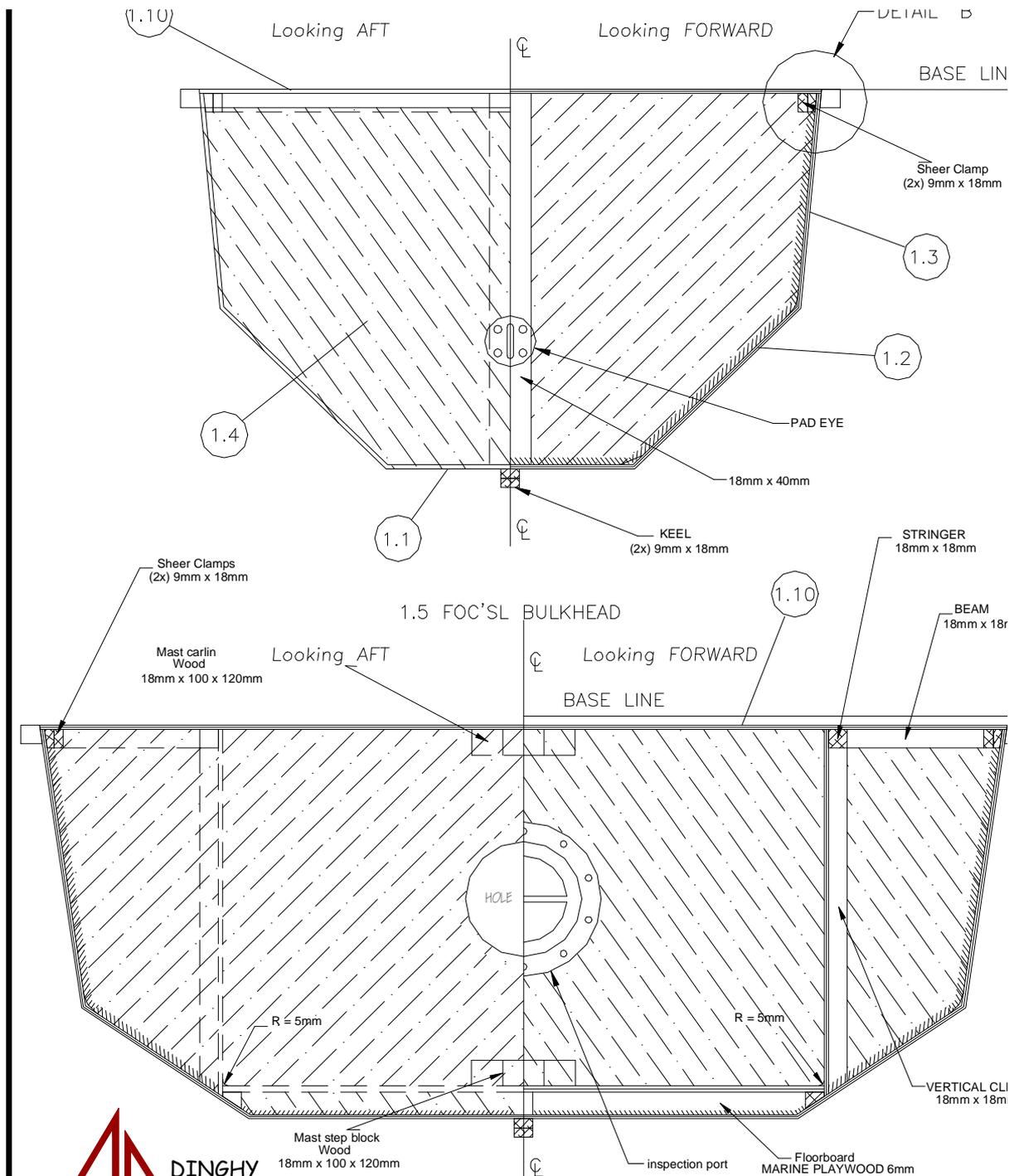




SAIL PLAN - LIFE SAVING DINGHY



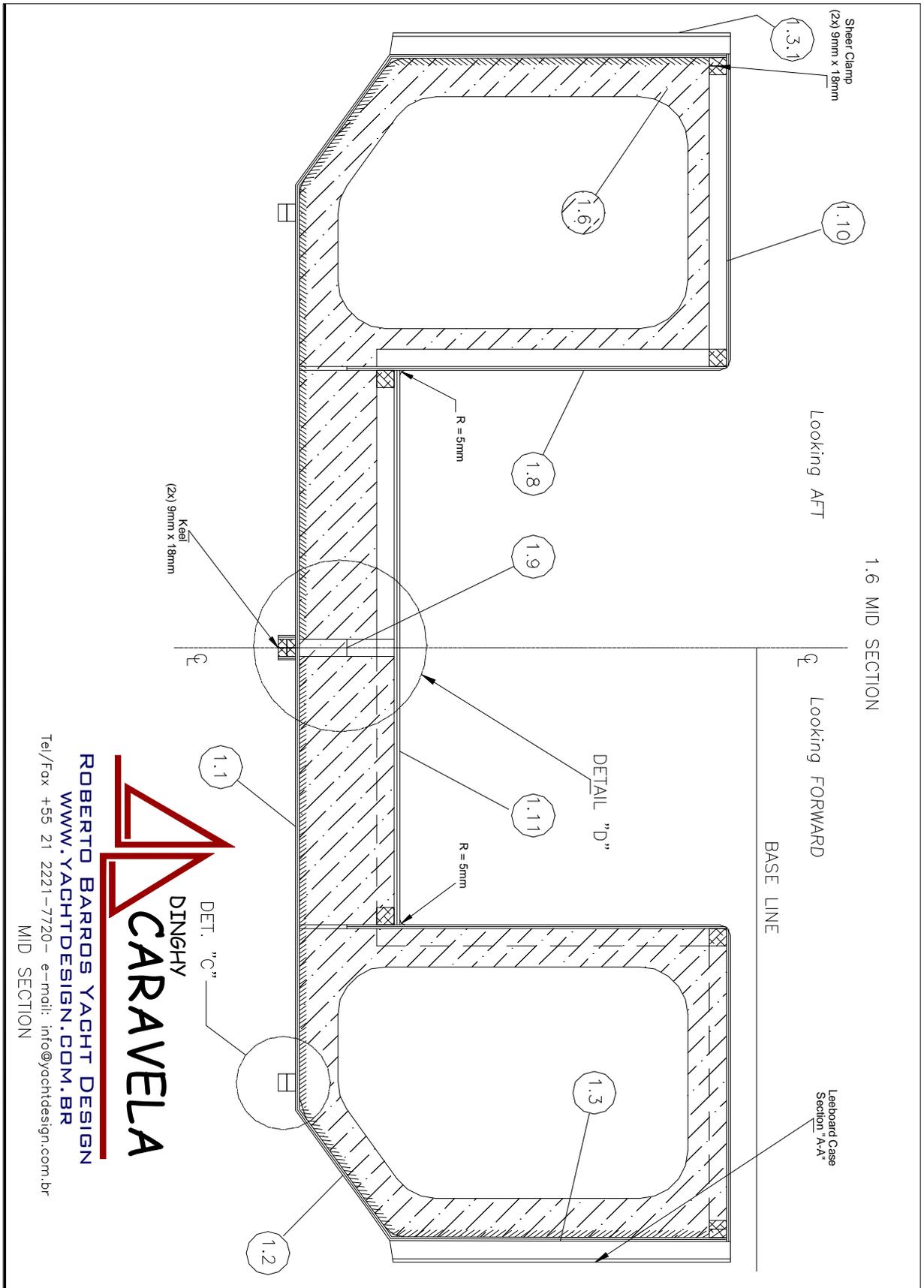


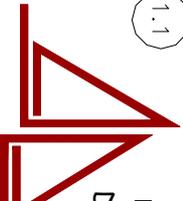


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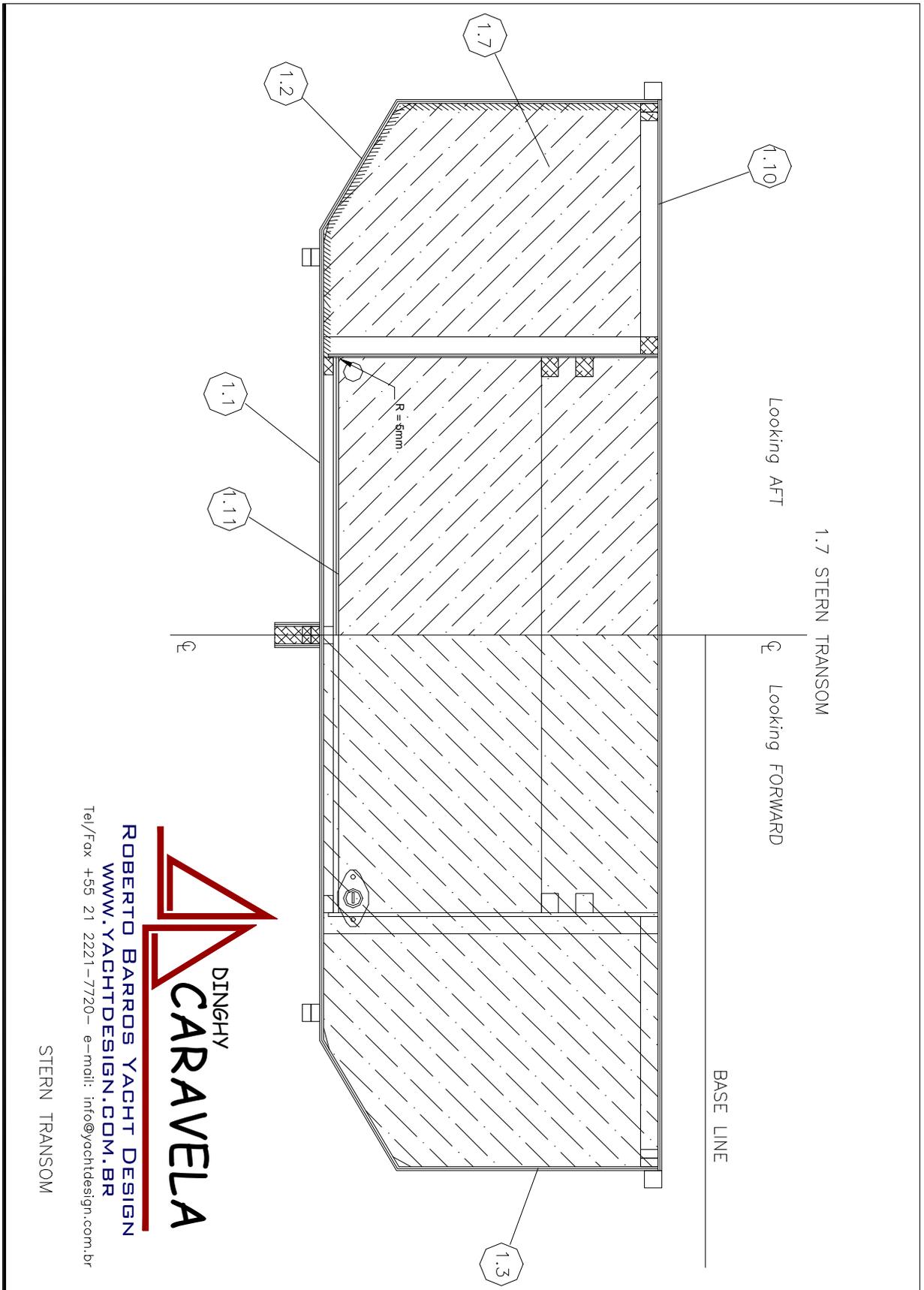
TRANSVERSE SECTIONS

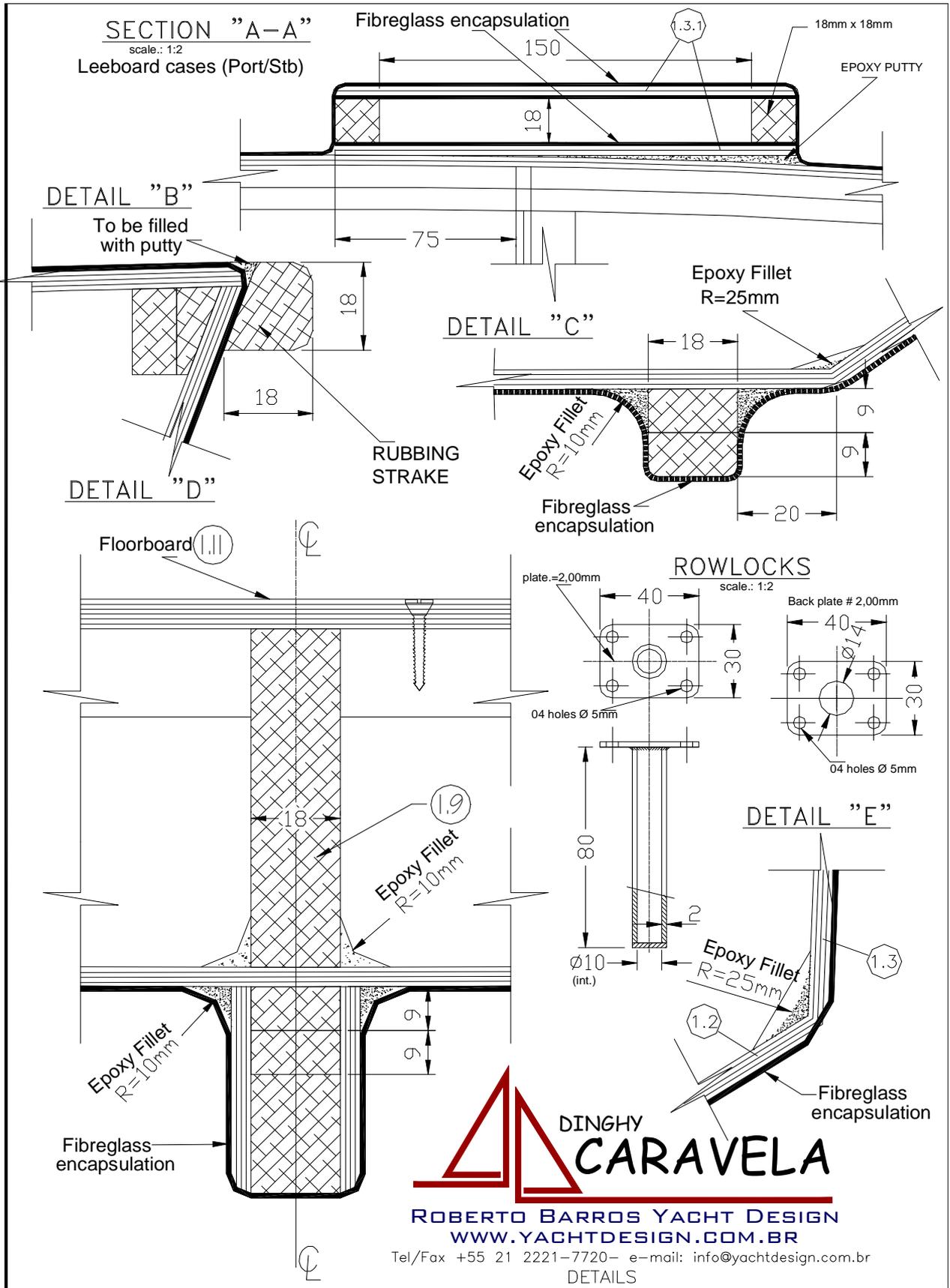


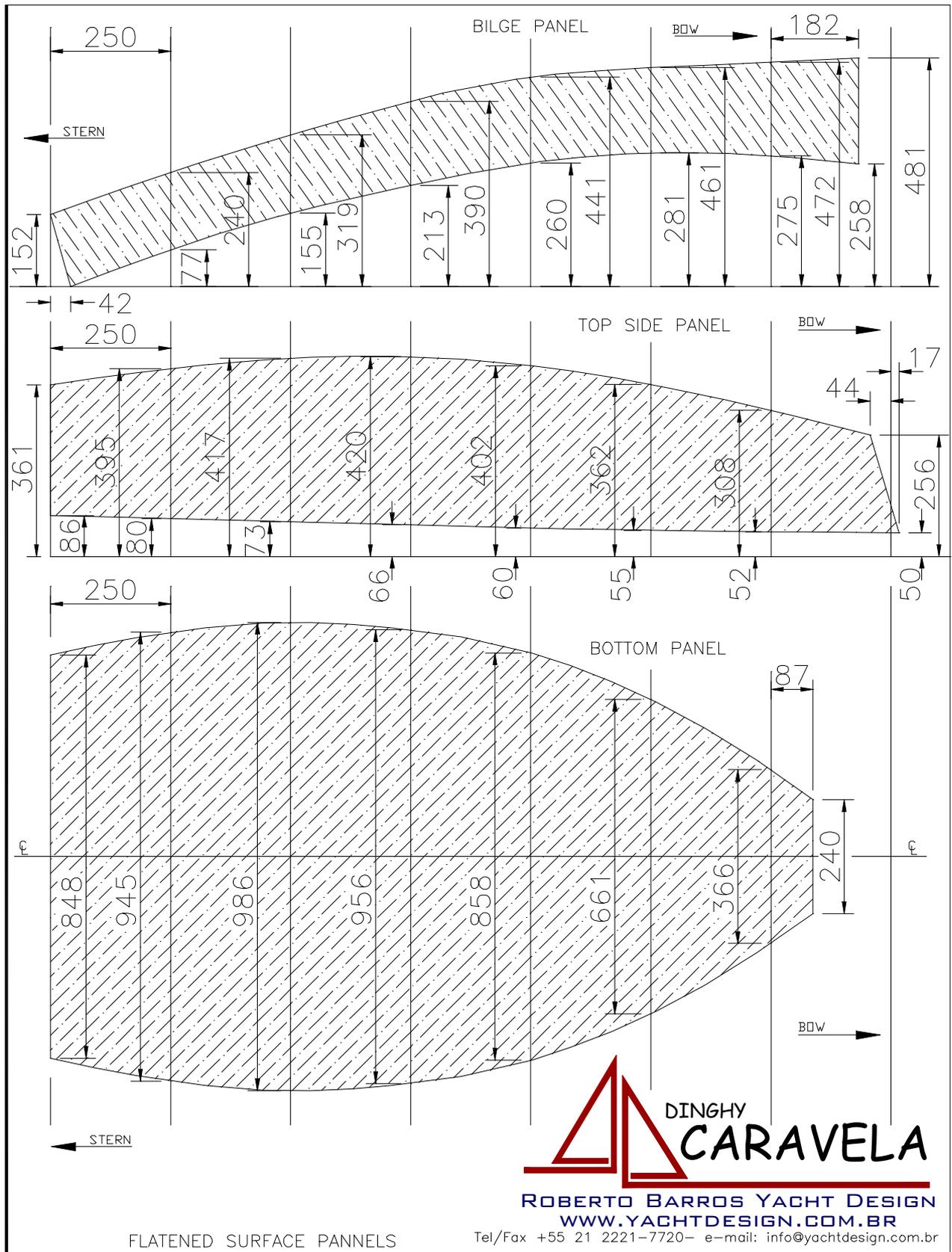


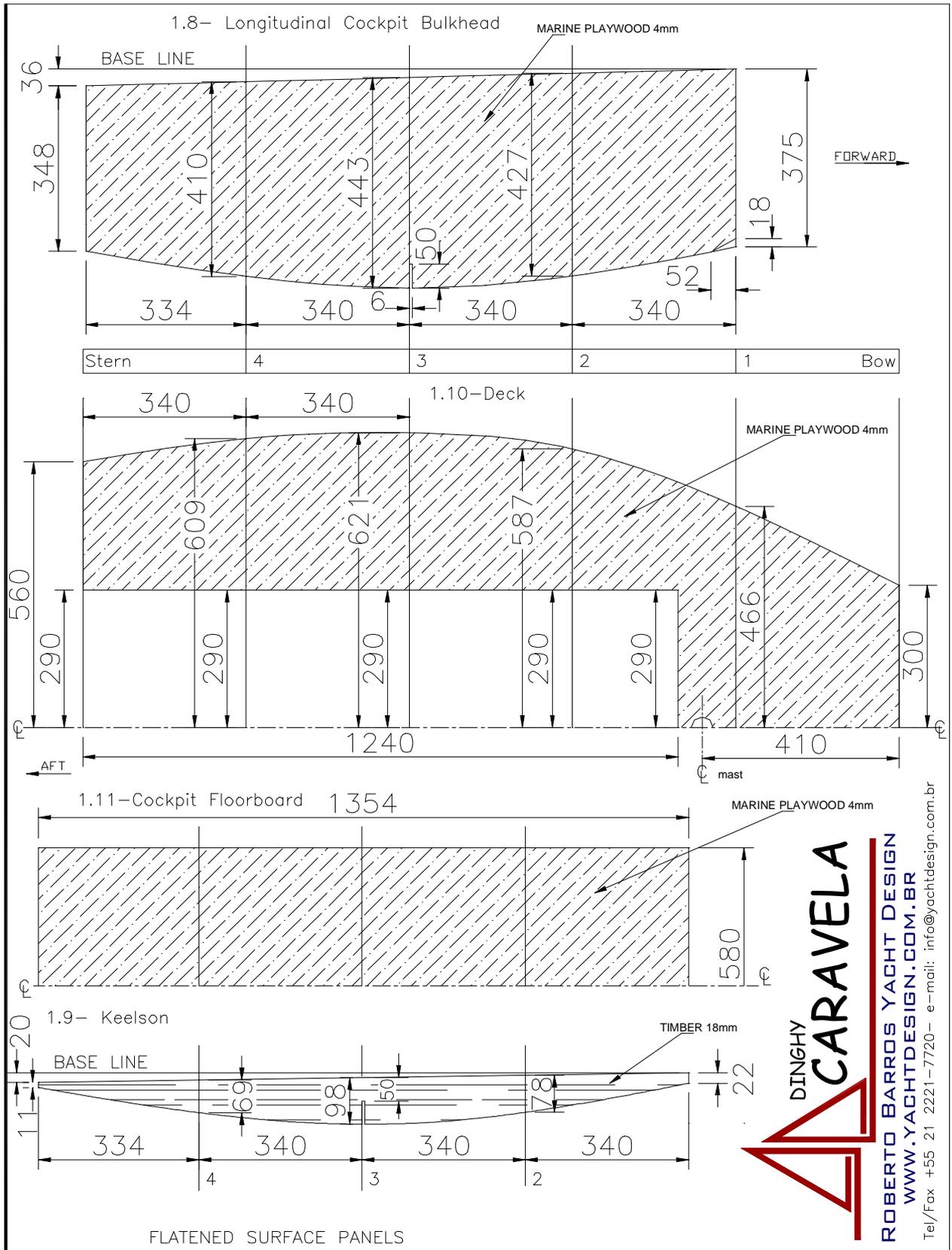
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 MID SECTION

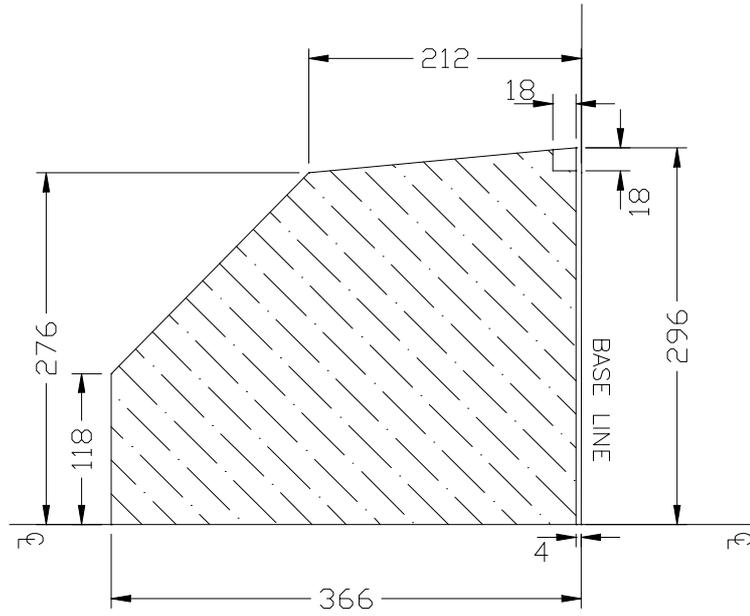
DINGHY
CARAVELA



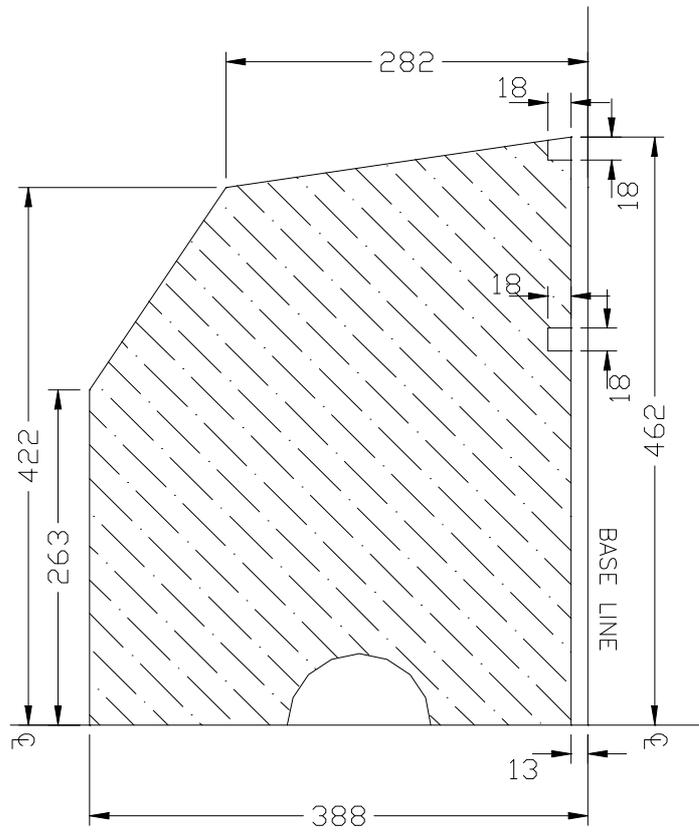




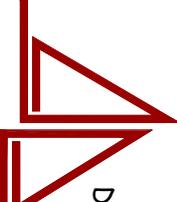




1.7 FORE TRANSOM



1.5 FOC'SL BULKHEAD


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