

MATERIALS LIST

QTY	NAME	PRICE
3	10 foot 3/4 inch EMT conduit	\$5.30
6	10-24 screws (2-pack)	\$1.85
12	1/4 inch nuts	\$0.06
1	3/16 x 1/2 inch grip range rivets	\$5.47
1	4 x 6 inch Lumber Tie Nails (5-lb)	\$16.57
10	3-1/8 x 7 inch Tie Plate	\$1.20
1	18 gauge Hanger wire (300')	\$7.48
1	16 gauge Steel wire (25')	\$1.96
1	12 gauge Hanger wire (100')	\$6.79
1	14 gauge steel wire (100')	\$6.28
1	Marine Adhesive (10 oz.)	\$19.77

TOOLS LIST

EMT pipe bender

Drill

1/4 inch carbide drill bit

Pliers

Rivet gun

Hacksaw

Marker

Clamp

Preparing Protrusions

CUTTING

PROTRUSIONS
Cut each EMT pipe in half to create 5 feet long segments.

Bend two pipes at 45-degree angles at quarter point, about 12 inches from one end. This creates two AB protrusions.

Bend two pipes at 30-degree angles at mid point, about 24 inches from one end. This creates two CD protrusions.

Bend two pipes at 5-degrees on either end, V12 inches from the either end. This creates two EF protrusions.

ARC

Bend pipe at intervals from the mid point outward at equal angles until the pipe forms an arc 3 feet long.

SUPPORT

The remaining, straight segment is the floor support.

DRILLING

The protrusions have holes that hold the nail ties, as well as holes for mounting to the boat. The nails are positioned outside the boat, beginning 24 inches from the end that is attached to the boat (A, C, E).

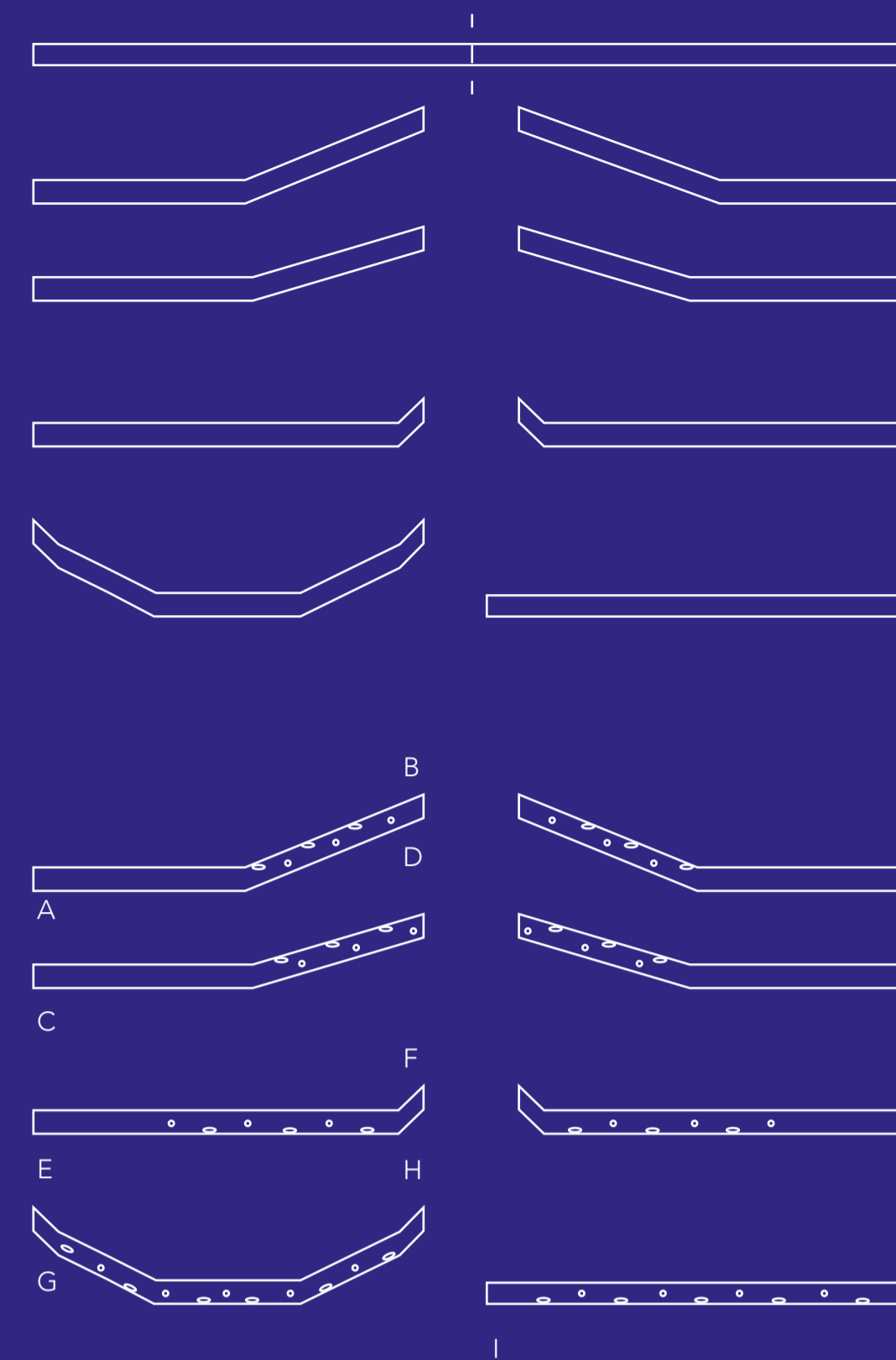
Do not drill the 12 inches from the ends points: A, C, E, G, H, I as they connect either to the boat or other protrusions.

NAIL TIE HOLES

Drill bisecting holes beginning at ends B, D, F, G, H and end 24 inches from ends A, C, E. The holes should alternate at 90-degree angles from each other bisecting the pipe.

MOUNTING HOLES

Drill two bisecting holes a 6 inches from ends A, C, E in parallel.



Mounting Protrusions

Mount the protrusions in this order:

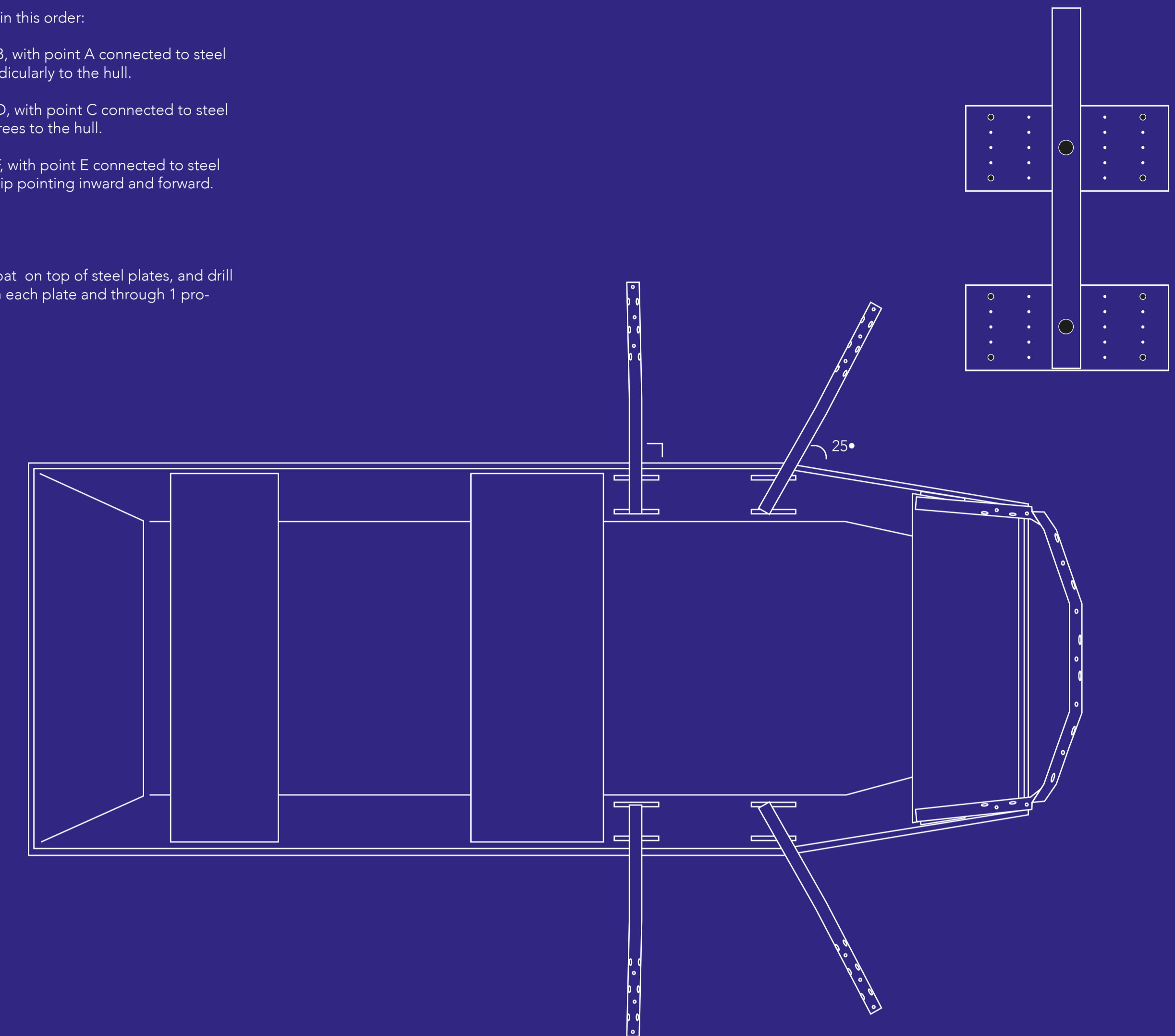
1L & 1R: protrusions AB, with point A connected to steel plate, oriented perpendicularly to the hull.

2L & 2R: protrusions CD, with point C connected to steel plate, oriented 25-degrees to the hull.

3L & 3R: protrusions EF, with point E connected to steel plate, with the curved tip pointing inward and forward.

DRILLING

Clamp protrusion to boat on top of steel plates, and drill two holes, one through each plate and through 1 protrusion.



ARC

GH protrusion to EF protrusions at points GH and F.

Clamp I protrusion at the bottom of the boat perpendicular to points A behind AB protrusions.

Preparing Boat

The steel plates act as reinforcements to the boat hull's material. The steel plates are mounted to the hull using rivets, to ensure a strong, hydrodynamic, low friction connection that can be made water-tight with marine sealant.

Two pairs of protrusions have two steel plate braces, while the bow pair have only one steel plate brace.

CUTTING

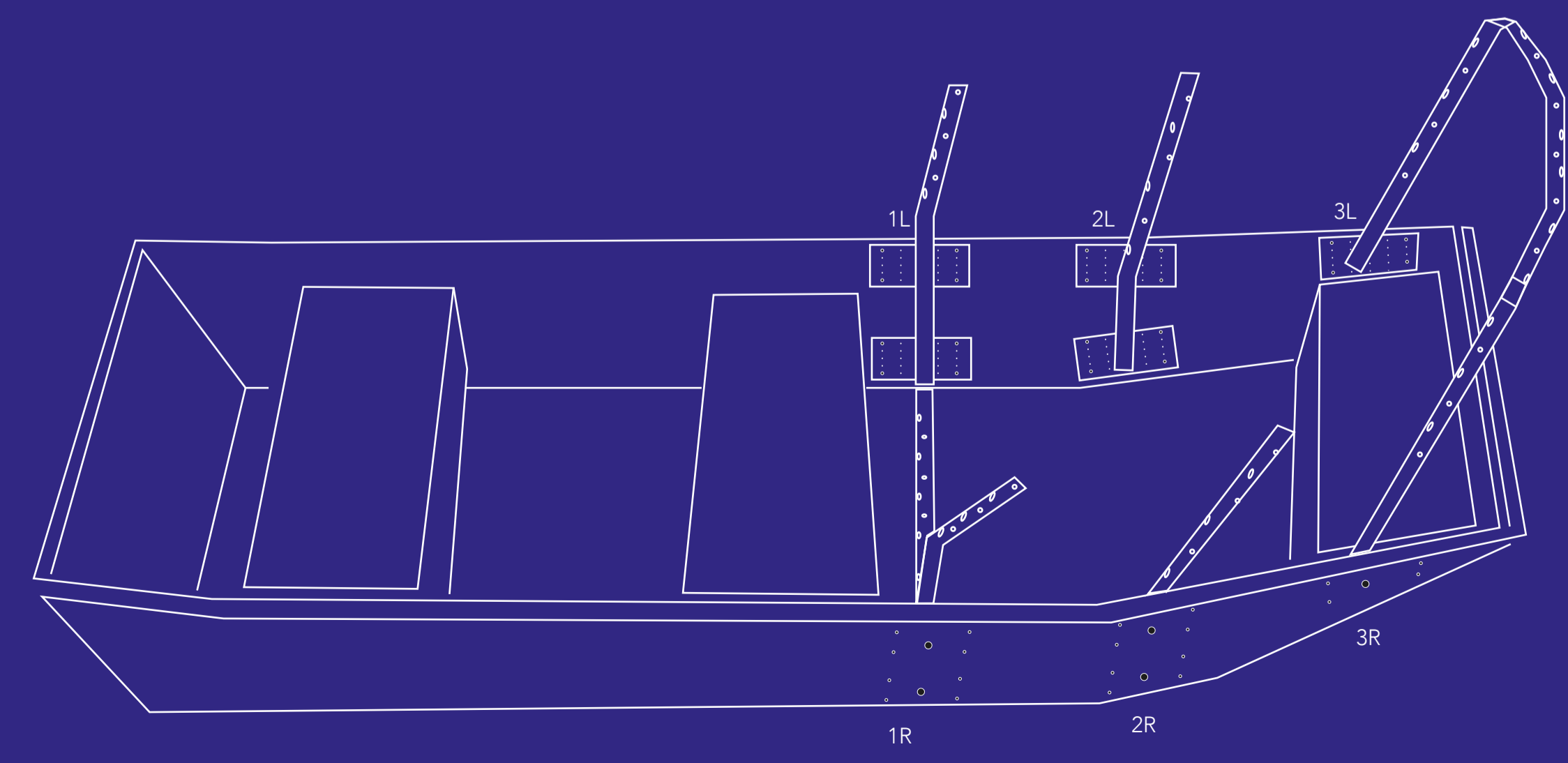
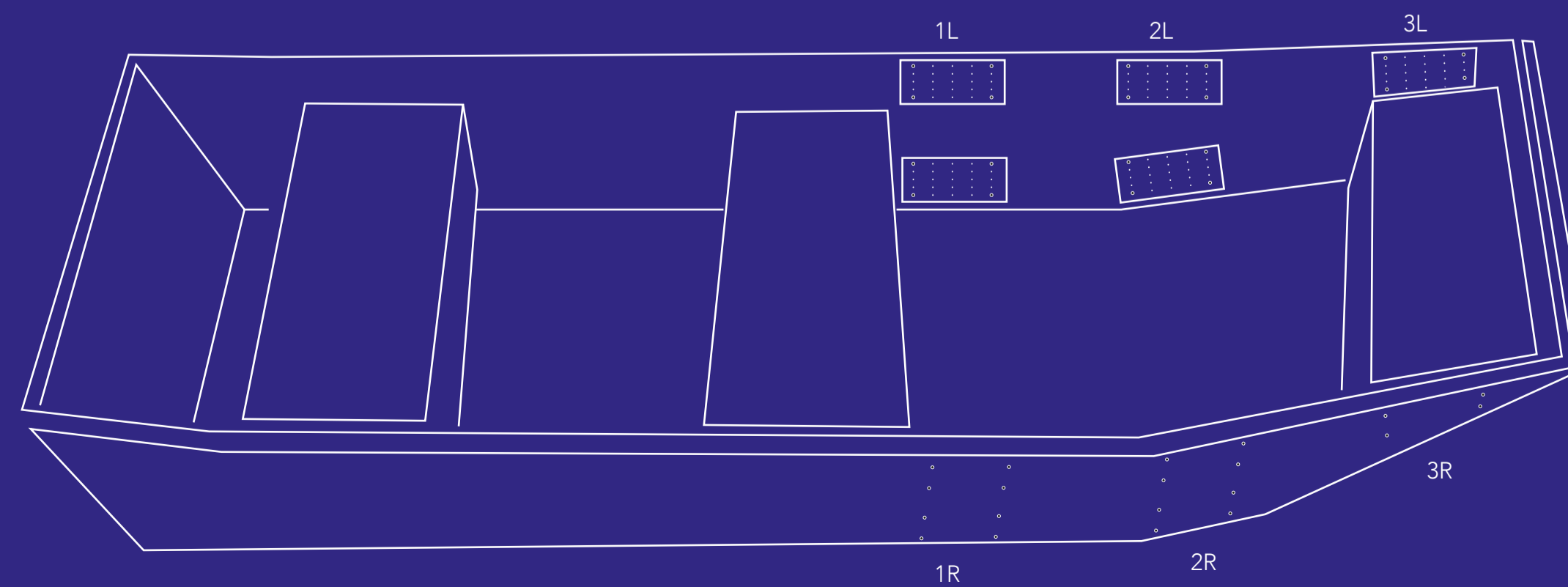
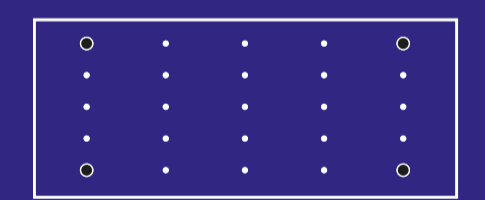
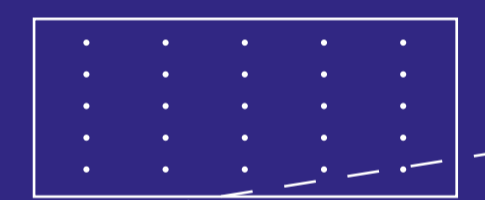
Cut one pair of the plates to fit on near the bow, if necessary.

DRILLING

Position three plates at equidistance from the mid-to the bow on the starboard side, marking the position with a marker.

Drill a hole in each corner of each steel plate and rivet it in place. Seal the rivet with marine adhesive.

Mount plate on the port side also.

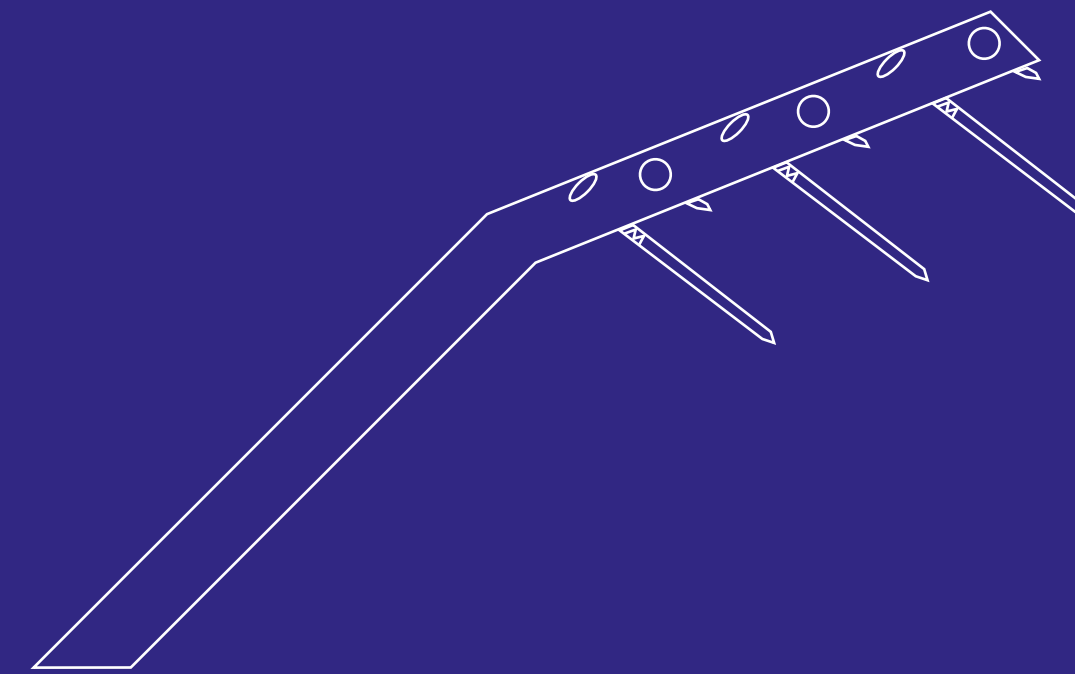
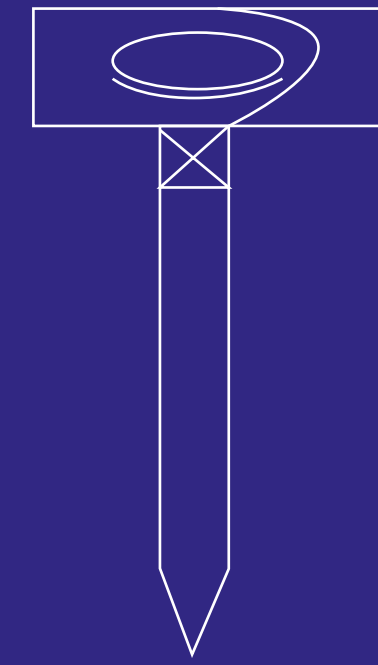


Charging Protrusions

NAILS

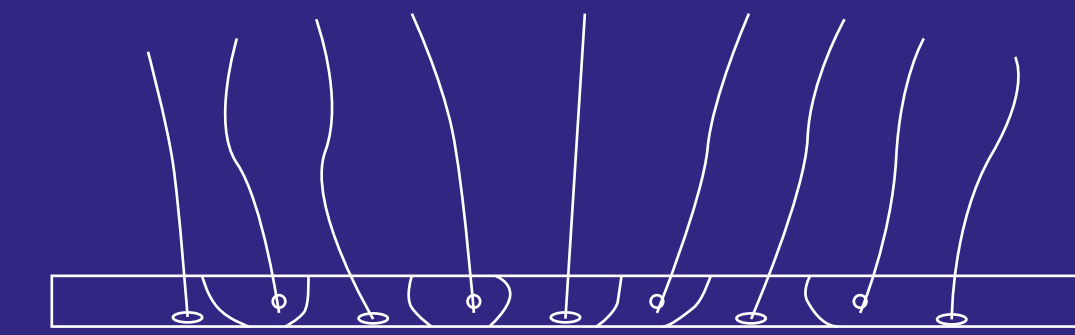
Insert nails through the protrusions so that they face forward and downward (away from passengers).

Wrap each nail from the with 24 gauge wire around the protrusion.

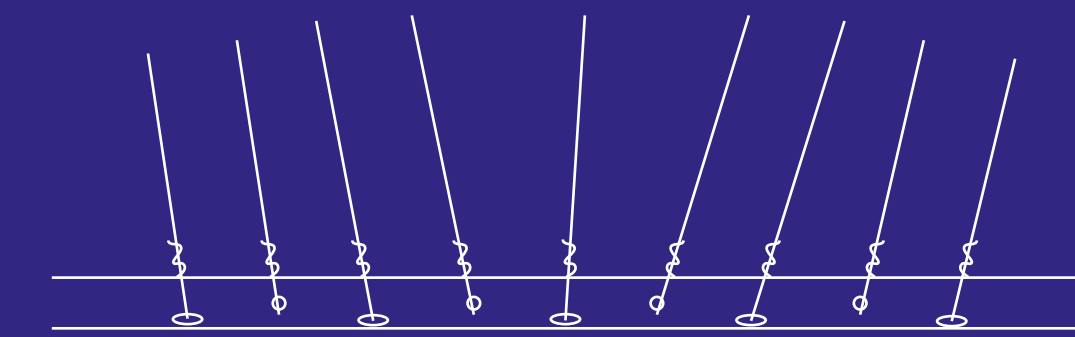


WIRE

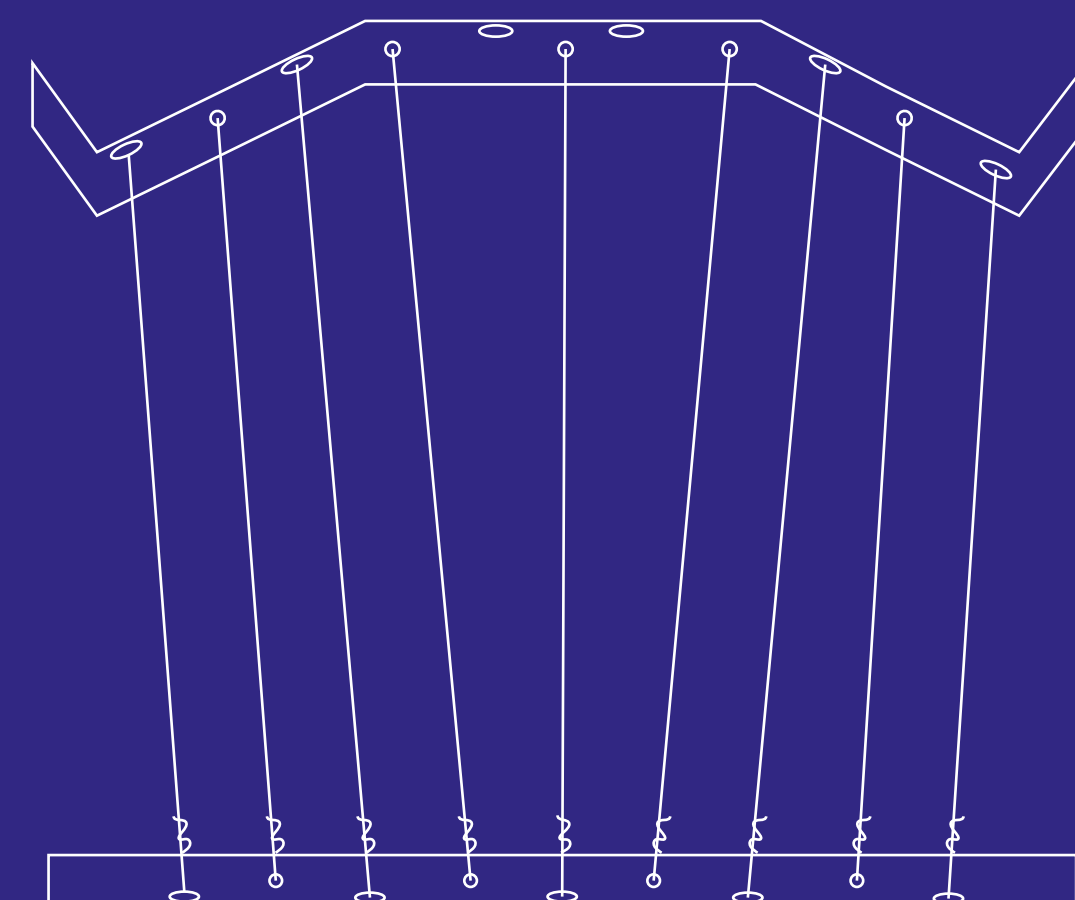
Loosely string wire from the arc on the bow down to the perpendicular support that is positioned on the floor. Work laterally, aligning one hole on the support with one hole in the arc. The wire can be temporarily secured by looping it around the protrusion.



When all the holes have been strung, secure 1 protrusion to the A points of the AB protrusions, at the floor of the hull, by drilling a hole through the protrusions on either side.



When 1 protrusion is secured, draw tension into the strings by pulling the string with the pliers, loop over the protrusion, and wrap around the strip.



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