Sanford Boat Co., Inc.
Box 268
Nantucket, MA 02554

tel: 508-228-4108
fax: 508-228-1986

SPECIFICATION for **MAGIC CLASS 30 ft wl yawl:**

I. General

1. These plans and specifications are intended to produce a seaworthy, offshore, cruising yawl of the following dimensions:

Loa:	40′— 0″
Lwl:	30′- 0″
Beam:	10′- 8″
Draft:	3′- 6″
Displacement:	15,500 lbs

2. Plans include:

a. Lines	3/4″ = 1′
b. Sail Plan	3/8″ = 1′
c. Construction Plan	3/4″ = 1′
d. Accommodation Plan	3/4″ = 1′
e. Lamination schedule	3/8″ = 1′

3. These specifications are intended as a guide and maybe modified with consent of owner.

4. Design, drawings and specifications belong to Sanford Boat Co., Inc.

II. Lofting

The plans have been lofted numerically by Matt Smith, NA. The numerical model will be used to generate and deliver to the builder:

1. 13 station molds, 11 intermediate molds, and two transom molds delivered as 3/4″ plywood
2. transom frame and transom shelf, delivered finished as 3/4″ plywood
3. stem profile, delivered as full size mylar drawing
4. keelson, delivered as four pieces 3/4 plywood cut to contour, ready for beveling and scarfing.
5. Rudder skeg mandrel, delivered as two pieces 3/4 plywood cut to shape.
6. Ballast keel, delivered as lead casting

III. Reference lines and dimensions.

The middle of the hull is taken to be station 5 1/2, or 198 inches from the zero reference at the front end of the waterline.

The station molds are placed toward the middle of the boat. In other words, the forward molds (those forward of #5 1/2) have their forward surface on the station line. Those aft of #5 1/2 have their after surface on the station line.

The hull framing is away from the middle. In other words, the forward frames (those forward of #5 1/2) have their after surface on the station line. Those aft of #5 1/2, and the one at #5 1/2, have their forward surface on the station line. The frames are allowed to cant to follow the surface of the hull, so generally the frame will be off the station line, away from the middle, only touching the station line at the sheer clamp and at stringer I, the frame's beginning and ending points.

The interior bulkheads are placed toward the middle, similar to the station molds.

If dimensions are to be precise, they are given in inches-sixteenths. Otherwise they are nominal. The offsets are written in inches to two decimal places.

IV. Materials

1. Timber is to be highest quality clear, well seasoned stock, quartersawn, of the primarily following species:

    a. atlantic white cedar
    b. angelique
    c. port orford cedar
    d. honduras mahogany
    e. teak
    f. white oak

2. Plywood is meranti, okoume or sapele, A/B BS 1088.

3. Glues specified are:
    a. WEST 105 epoxy, for general gluing and laminating.
    b. WEST thickened G-flex epoxy, for gluing steam bent frames.
    c. SMITH penetrating epoxy for sealing bare wood
    d. 3M 5200 polyurethane, for flexible adhesive caulking.
    e. black LIFECAULK polysulfide for deck seam compound.
    f. STIKAFLEX 521UV or DOLPHINITE bedding compound for non-adhesive caulking and bedding.

4. Bright finish means two coats of Sikkens Cetol Marine Wood Finish followed by 1 coat Cetol Marine Wood Gloss Finish.

5. Bronze castings are to be produced from owner supplied patterns and to be made of silicon bronze, CDA 655 alloy.

6. Stainless steel, is to be type 316 or 18-8.

V. Hull structure

1. The hull is constructed consists of narrow, and edge-set planking fastened to frames bent over longitudinal stringers. A laminate of multiple layers of diagonal wood veneers is glued over the planking.

   The discontinuous corners of the hull and deck structure, hull/deck, stem, horn timber, hull/keelson, are reinforced with a fiber glass/epoxy laminate.

2. Centerline structure:
   a. The stem is made of ½" okoume plywood with a 1 1/2" layer of port orford cedar laminated either side. It is generally triangukar in section with the after edge 3-8 wide and the thickness set by the plywood cutout.
   b. The keelson is 2 layers of 3/4" sapele plywood.
   c. The mast step is Douglas fir and ties the stem to the keelson.
   d. The horn-timber is po cedar, 1-8 x 3-8, milled to shape.

3. Stringers are po cedar, 1-0 x 3-8,*:* scarfed into single lengths. There are 5 stringers each side.

4. The beam shelf is ½" sapele plywood cutout roughly 5-8" wide. It is scarfed into a single piece starting in the bow as breast hook and ending in the stern as upper transom frame.

5. Frames are white oak, 1-8 wide, 1-0 thick, laid on the flat over the stringers. They are on 18" centers, roughly on the half-stations and allowed to cant with the hull shape. Frames are glued with Thickened WEST G-flex to stringers and sheer clamp and mechanically fastened with 2, 1 1/2" #10 stainless steel wood screws, set 1/4" to get good bite on stringer.
   a. Frames on stations –1 through 9 are steam bent over the stringers.
   b. Frames at station 8 1/2 and 9 need additional formwork to obtain the correct curvature (minimum radius = 15 inches at station 9).

c. Frame at stations 9 1/2 and 10 are split, steam bent and glued (minimum radius = 9 inches)
d. Frame at station 10 1/2 is made of two almost straight pieces joines by a corner block.
e. Frames at station 404 is sawn of two straight pieces.

6. Planking is 5/8" thick atlantic white cedar. It is 6:1 scarfed into full lengths. Planking process starts at the chine line and works out from it, upwards and downwards. The planking is edge-set, rather than spiled, and tapered in the aft topsides as required to keep it running approximately parallel to the shear. The planking lands on the stem and transom frame. Planking is glued to frames and stem and fastened with 1 1/4" silicon bronze boatnails.

7. Interior finish: The interior of the planking, frames and other structure are to be sealed with 2 coats Smiths penetrating epoxy.

8. The following corners are discontinous:
   a. hull-deck joint
   b. around front edge of stem
   c. hull—keelson corner around bottom of hull
   d. across horntimber
   e. transom—hull corner, including chine close to transom
   f. interior corner forward of ruderpost

   They are to have laminate of fiberglass/epoxy around them, approximately 1/16" thick, applied over the planking before the cold molding is installed. These corners will be radiused 1/2". The laminate replaces, locally, the first layer of cold-molded hull laminate.

   The hull laminate consists of 1/8" atlantic white cedar and teak veneers. The laminates are run approximately 35 degrees to horizontal in alternate directions. Layers 1 and 2 are cedar, the final layer is teak laid in carvel style.

9. The stem shoe is 2 layers of 0-8 thick angelique. The first layer is oversized (width) and screw-fasten and glued to front edge of hull. The second layer is glued, and clamped to the first. When the glue is cured, the clamps are removed and the shoe is cut to size and shaped.

10. Finish. Entire exterior of hull, excluding cap rail and rub strake, to be coated with 20 mils of high build epoxy undercoat.

    a. Topsides, from cap rail to boot-stripe, painted 2 coats black one-part polyurethane.
    b. Boot stripe, painted 2 coats antifouling white.

c. Bottom, painted 3 coats green, antifouling (Micron Extra).
d. Rub strake and cap rail finished bright.

VI. Thruhulls.

There are five thruhulls, 4 thru the wooden hull and 1 into the bronze centerboard box, as follows:

1. Two cockpit scuppers, 2", Marelon (Forespar # CF 201 2), perpendicular to hull surface, 1" backing block. The Forespar piece will be machined to have a flush style head.
2. Head discharge, 1 1/2" CPVC pipe nipple, vertical, with beveled backing block.
3. Galley seawater intake, 1/2" Marelon (Forespar #CF 250S 1/2) , perpendicular to hull with no backing block.
4. Galley sink discharge, head sink discharge and head intake, 1 1/4" bronze pipe nipple welded to CB box.

The Forespar thruhulls are bedded in place with Stikaflex and held with their nut.

The CPVC nipple is 5" long and threaded both ends. It is glued into hull with 3M 5200 which will bind around the threads. It is cut off flush with hull surface after installation.

VII. Ballast keel.

Ballast keel is cast antimonial lead approximately 7600 pounds. Keel is fastened to hull with two rows of 7/16" x 4" silicon bronze lag screws through keelson spaced 9" o.c., about 36 lags.

The centerboard pin housing will be cast integrally into the keel.

VIII. Rudder and Centerboard:

1. Rudder to be 3/8" sapele plywood fastened to hollow bronze shaft. The shaft is 1.500" aluminum bronze shaft, center bore 1".
2. Centerboard to be greenheart, with integral bronze bushing for the pin hole and a bronze tang for lifting pennant.

IX. Interior

1. Bulkheads to be 1/4" plywood with 1/2" solid wood panel frames laminated on each side. Bulkhead #B124, in way of mast is 1/2" plywood.

2. Cabin sole: 0-12 x 3-8 teak boards over 1-0 x 1-8 beams, on the flat, 18" o.c.

3. Bunks:
    a. Bunk bottoms to be slatted construction of 5/8" Atlantic white cedar boards cross banded with 0-12 x 2-0 boards.
    b. Bunk cushions to be 4" thick, closed-cell foam.

4. Drawers:
    a. Drawers to be 3/8" carcasses with 1/4" plywood bottoms and 1/2" front faces.
    b. Drawers to lock in via traditional lift up design.
    c. Drawer pulls to be finger holes, left open for ventilation.

5. Doors: 1/4" plywood with 0-8 thick framing laminated each side. Small doors for cabinets are 1/4" plywood with 0-4 x 1-4 frames.
6. Vertical panels: 1/4" plywood with 0-8 thick framing laminated per drawings.

7. Counter tops: 5/8" plywood with various surfaces laminated on and various fiddles mounted.

For non-structural bulkheads and cabinetry the species of the plywood and the frame stock, the glues, the fastenings and the hardware will be determined after discussion with the cabinet maker.

X. Layout and installation of interior

Generally, only the bulkheads will make structural contact with the hull, and then only at the stringers. There are about 100 bulkhead/stringer connections.

At each stringer a joining block, cut proper bevel from 1-0 x 1-8 stock, 3-0 long, will be fastened to the stringer with 2 #12 x 2 SS RHWS and glued to the stringer. The bulkhead will be put in place and attached to the block with a 5/16" SS hex head bolt.

The location of the block, fore or aft of the bulkhead, will be determined by visibility, accessibility, and possible interference of frames. A schedule of the transition blocks, their bevel and location will be available.

Once a bulkhead is installed, the adjacent panels and surfaces are attached and then the next bulkhead is installed to them, with those panels and surfaces will set the position of the next bulkhead.

XI. Deck

1. Deck stringers are douglas fir, 1-8 x 1-8. There are 4 stringers, supported by the interior bulkheads and temporary supports as required.

2. Beams are laminated to the approximate deck crown of two thickness of 1-8 wide x 0-8 thick Douglas fir, (Certain beams are 3-8 wide), laid on the flat, approximately 18" o.c. Beams are glued to the stringers and mechanically fastened with 2, #10 x 1 1/2 stainless steel FHWS, set 1/4" to give a good bite on the stringer.

3. Deck planking is 1/4" thick sapele plywood is glued over deck beams.

4. Teak surface is 0-10 x 1-12, quarter sawn, sprung-laid decking, fastened to sub deck with 3M 5200 glue and screwed or nailed while glue cures. Fastenings will be removed, and their hole shall be bunged. Planks will have 1/4" wide joint, 3/8 deep, filled with black LIFECAULK.

5. The edge of the deck will be finished with a molded, lens shaped and tapered, rub strake made of 0-12 x 3-8 black locust. Rub strake to be installed in relatively short lengths, 8 to 10 feet, to facilitate repair and replacement. It is attached with wood screws and STIKAFLEX caulking compound.

XII. Deck structures

1. Cockpit
   a. Sole is 1/4" sapele plywood covered by 5/8" teak, similar to main deck.
   b. Sole is supported by athwartship douglas fir beams, 1-0 x 1-8 on the flat.
   c. Sides are 3/4" meranti ply.
   d. Interior corners are 2 x 2 cove moldings, mahogany for vertical corners, teak for horizontal corners.
   e. Coaming consists of 3/4" mahogany boards through bolted to deck frames with 5/16" bronze bolts. Corner posts 3-0 x 4-0, molded per drawings.
   f. Drainage provided by two 2" bronze thruhulls in after corners.

2. House may be built separately and installed in one piece.

   a. House coamings are 3/4"meranti ply. Coamings are fastened to the deck with #12 x 3" stainless steel RHWS, 4" o.c.
   b. House top is two layers of 1/4' saplel ply.

i. House top is fastened to 7, 0-12 x 1-8 douglas fir house beams, generally 18″ o.c.
ii. House beams are bent over two douglas fir stringers, 1-8 x 1-8 with special molded shape per drawings (to make hand holds), running fore and aft between ends of the house. House beams are glued to the stringers and mechanically fastened with 2″ x #12 stainless steel wood screws.
iii. The house top is coated with a layer of Dynel cloth set in epoxy resin, **being careful to use only enough resin to wet the fabric, and making sure to leave the weave of the fabric exposed to create a non-skid finish.**

c. Ports: House to have 4 opening bronze rectangular ports, ABI #132112, and 2 non-opening ports, ABI 140212.
d. Companionway hatch runs on bronze slides and is housed in a water protection box made of 1/4″ plywood and painted finish to match house top. Hatch to be fitted with handles and a lock-set in its weatherboard.

3. Forward hatch
   a. Forward hatch coamings and frame to be made similar to house. Hatch top to be 1/2″ meranti plywood.
   b. Opening to be sealed with weather-stripping and latches per drawing.
   c. Coamings have a fixed port, ABI 140212, either side.

4. Liferaft hatch. Will have mahoghany coamings 3/4″ thick and a top of 1/2″ meranti ply.

5. Bulwarks are formed by two pieces, a teak base, 1-8 x 1-0 molded trapezoidal; and above, 0-12 x 3-0 max atlantic white cedar plank. The cedar plank has sheer cut into it. The teak base is glued to the deck and held in place with 1 1/2″ x #8 wood screws 8″ oc. The cedar plank is glued and screwed to it similarly. The bulwark is capped by a molded mahogany cap 0-12 x 2-0, run continuously around the vessel and across the stern.

6. Finishes:
   a. House top to be painted buff.
   b. Coamings to be finished bright.
   c. Bulwarks to be painted white on inside, black, as topsides, on outside. Cap rail to be finished natural.
   d. Hatches are finished bright.

XIII. Deck gear.

1. Lifelines:
   a. Vessel to have bow and stern pulpits of 1″ stainless steel tubing, three regular and two gate stanchions per side.

b. Stanchions and pulpits are mounted with bronze bases (custom castings) through bolted to sheer clamp.
c. Upper lifeline is 30" above deck and made of 3/16" plastic coated wire; the lower lifeline is 17" above deck and made of 5/32" uncoated wire.

2. Chocks:
   a. Bow chocks are bronze (custom castings) built into the stem p & s.
   b. Stern chock are bronze (custom castings) set into bulwark on either quarter.
   c. Additionally there are two panama chocks built into the bulwark, each side, amidships.

3. Ventilators:
   a. 2 cowl ventilators supplied, one on either side of the mast, with a mushroom vent inside.
   b. A mushroom ventilators is placed on the liferaft ahtch

4. Jib sheet winches to be Anderson #46 set on pedestals.

XIV. Rig (Spars amended 4/09)

1. Mainmast.
   a. Mainmast is a box section, tapered, Sitka spruce hollow spar. Dimensions are 4-8 x 6-12 by 43 ft long. F & A staves are 1-0 thick, side staves are 0-12 thick. The corners are rounded to a 3/4" radius.
   b. A 1/4" x 1/2" track riser is glued on the aft side per drawing.
   c. Solid and partial blocking, of spruce, is glued to staves per drawings. The solid blocking is fitted to drain.
   d. An aluminum mast head fabrication (supplied by others) is glued in, in lieu of blocking at the mast head.
   e. The interior is finished a thin coat of with epoxy sealer.
   f. Under the bolts for shroud and sstay tangs are black locust cleats glued to the mast per drawings.
   g. Plastic 3/4" electrical conduit is installed starting just under the deck, with outlets p&s below the spreaders, on thefore side of themast above the hounds and terminating in the masthead fabrication.
   h. There are three halyard winches, Andersen #16 port and starboard, jib and main, and #26ST starboard, main. The corner rounding is omitted where it interferes with the winch bases.

2. Mizzenmast:
   a. Mizzenmast is a box section, tapered, Sitka spruce hollow spar. Dimensions are 3-0 x 4-0 by 23 ft long. F & A stave thickness

is 0-12 in, side staves are 0-8 thick. Construction details are similar to mainmast.

b. At masthead, in way of halyard sheave, side staves are black locust scarfed onto the lower sitka spruce stave.

3. Main boom is a box section, tapered Douglas fir spar of dimensions 3-0 x 5-0 by 17'6" long. Top and bottom stave 0-14 thick, side staves are 0-10 thick. Construction details are similar to mainmast.

4. Mizzen boom is a solid, tapered Douglas fir spar of dimensions 1-8 x 3-0 by 8 ft long.

5. Standing rigging. 1 x 19 stainless steel wire with Norseman fittings per schedule. Turnbuckles are bronze with toggles on lower ends.

6. Running rigging. Per schedule.

7. Blocks and cleats. Per schedule.

XV. Engine

1. Engine is Yanmar 1GM10C 9 hp diesel with sail drive.

2. Engine mount is Yanmar supplied fiberglass base cut to fit hull and glued into horn timber/sternpost structure.

3. Fuel system:
   a. 25 gallon plastic fuel tank mounted under cockpit.
   b. fill is 1 1/2" to fill in cockpit sole. Tank vent is housed on aft cockpit coaming.
   c. Fuel lines are 5/16" Aeroquip FC300 with reusable brass fittings with flare connections.
   d. Primary fuel filter is Raycor single filter with a fuel shutoff at inlet.

4. Electrical:
   a. Engine start battery is located under aft quarter bunk and is wired per electrical plan.
   b. Instruments are housed with navigation instruments and consist of warning lights supplied by Yanmar and tachometer by VDO #430 004.
   c. START and STOP controlled by waterproof pushbutton switches mounted on either side of pedestal.

5. Engine throttle and clutch controls to be Kobelt Model 2044 mounted on the cockpit wall, starboard side.

6. Exhaust system:
    a. Muffler is VETUS NLP45 mounted in the engine room starboard side.
    b. Exhaust hose, 1 7/8", rises from muffler alongside bulkhead 304 and curves to starboard. At its apex is a anti-siphon vent and a 2" ball shut off valve from whence it runs aft behind the cackpit locker opening to a 2" thru-hull just short of transom.

7. Cooling system:
    a. Cooling water enters boat through a 1" thru-hull and seacock under galley sink.
    b. Immediately after the seacock is a strainer accessible through the door under the sink.
    c. After the strainer there is a tee to supply the galley sink and head forward with seawater. The main line connects to the engine cooling water inlet with a 5/8 hose, Aeroquip 2556 with push-on brass fittings.
    d. From the cooling water outlet, a riser runs, with an anti-siphon vented loop mounted on the front end of the cockpit and returns to the exhaust elbow.

XVI. Mechanical

1. Electrical:
    a. House batteries to be 4, 31 sized, 12v batteries, gel or AGM type.
    b. Main panel shall be protected by a 50 amp circuit breaker and have a digital volt and amp meter. Distribution shall be 16 circuits, circuit breaker protected. The panel is located over the chart table, with access through a door in the galley.
    c. Wires shall sized for .3v voltage drop and have crimped eye terminals, with glued heat shrink insulation and number markers at each end.

2. Bilge pumps;
    a. A 2" Edson bronze diaphragm manual pump shall be installed inside the boat operable in the companion- way.
    b. 1 1/2" diaphragm manual pump shall be installed accessible to the helmsman in the cockpit.
    c. An electric pump shall be installed.
    d. All three pumps shall be protected with strum boxes and high, vented loops to prevent back siphoning. They shall discharge through the cockpit scuppers. A piping diagram will be supplied.

3. Fresh water tanks and piping:

a. Two 35 gallon plastic water tanks shall be installed under main saloon bunks. They are to be supported by stringer "C" and "D" and fastened to resist a 2000 lb force in any direction.
b. The tank vents will discharge into the CB pennant tube. The tanks shall fill through the draw pipe and the fill pipe shall run to a deck plate on the port deck.
c. The fill/draw piping shall be 1" from the deck to a tee with a 3/4" pipe to each tank. The fill and each branch to the tanks shall have a ball shut of valve.
d. There are two sinks, one in the galley and one in the head. The galley sink is made of 1/2" x 12 x 12 soapstone tiles.
e. The draw piping shall run to each sink and be powered by a foot pump, Whale #GPO0550, at each sink. Cold water only. Galley sink to also have a sea water Fawcett connected to foot pump, Whale #GPO0550. Sea water source is seacock under galley sink.
f. System to have a drain plug at low point to drain all water from system.

4. Sanitation:
   a. Head to be Wilcox-Crittendon "Skipper" model.
   b. Head to discharge through vented loop (just under deck) and 1 1/2" seacock.
   c. Discharge line to have 3-way valve leading to holding tank under forepeak deck. Tank to be vented and have pump out line to deck plate on port deck. Piping diagram to be supplied.
   d. Head sea water supply comes from seacock under galley sink via 3/4" hose, Aeroquip 2556, with push-on brass fittings.

5. Cooking stove and propane:
   a. Cooking stove to be 2-burner with oven gimbaled propane stove [model____].
   b. Propane to be kept in 2 10 lb aluminum horizontal cylinders mounted just forward of house, behind mast.
   c. Regulator to be mounted on house top just aft of bottles.
   d. Supply line to run from regulator to through a housetop fitting near stove with shut off valve. Valve to be inside cabin and operable from cook station.

6. Heating stove and chimney: not yet specified

7. Icebox:
   a. Icebox to be supplied by Glacier Bay insulated with their Barrier Ultra R super insulation with a size "C" hatch. Outside dimensions are length: 35", depth 28" and height 24" front, 14" back.

b. Box to have drain hole in bottom connected to foot pump, Whale #GPO0550, with discharge connected to galley sink drain.

XVII. Ground tackle:

a. Three anchors to be supplied: 35 lb CQR, 35 lb Bruce and a 50 lb Herreshoff fisherman style anchor.
b. 3 chain rodes, 5/16" galvanized steel, 20 ft length.
c. 6 rope rodes, 1/2" nylon three strand line, 100 ft each.