J. BOTTERILL & SONS

Cr. Hanna and Kavanagh Streets

SOUTH MELBOURNE, S.C.4

SPECIFICATION 40 ft ARMY WORK BOAT

5-10-43

I Length Overall 40 feet

Beam 12 feet

Draft 4 ft. 6 inches

Maximum width to outside Belting 12'-8"

Overall height on cradle 13 ft

2 KEEL To be of 6" x 3" jarrah 35 feet long.

To be in two pieces scarphed 18 inches at 18 or 20 feet from bow.

The Keel is to be fastened to hog and deadwood with seventeen $\frac{3}{4}$" diameter and eight $\frac{1}{2}$" diameter copper or bronze bolts.

3 HOG To be of 8" x 2" jarrah 34 feet long.

To be in two lengths scarphed about 12 inches. Joint to be well separated from butts in Keel and deadwood.
The lower edges of hog to be bevelled back to Keel to form rabbet for garboards.

4 DEAD-WOOD The deadwood to be built up of jarrah faced 6". The after deadwood to lay paralell with the tail shaft and to be bored to take same.

5 SHAFT LOGS To be formed from 6"x6" jarrah to be placed paralell with tail shaft and bored in line with hole through keel and deadwood.
Shaft logs to be fastened through the hog, keel and deadwood with six $\frac{3}{4}$" copper or bronze bolts.
To be checked 1" deep to take ends of ribs.

6 STEM The stem is to be built up from jarrah and a grown Knee. The latter extending about 30 inches either way and moulded 7" or 8" at throat. The knee to be faced 6 inches and fastened with eight $\frac{3}{4}$" copper or bronze bolts.
The apron is to be of 5"x10" jarrah bevelled to form a 5"x1$\frac{1}{8}$" rabbet for plank ends. All other parts faced 6 inches.
The stem to extend aft about 6 ft. and to be fastened with five $\frac{3}{4}$" copper or bronze bolts in addition to those through the Knee.
Not less than two bolts must pass through stem, hog, keel and deadwood.
Checkouts will be required in stem and hog for seven pairs of ribs in bow.
The leading edge of the stem is to be protected with a substantial cast bronze strip and plate, extending well back along the keel.
The upper end of stem to be fixed to gunwales, the ... moulded

STEM (continued) grown breast hook faced 3" with ½" copper or bronze bolts.

7 TRANSOM

The transom is to have a double skin of oregon planks.
The inner skin of 6"x½" running at 45°, and the outer of 6"x⅜" running horizontally. A layer of oiled canvas to be placed between the skins.
The two sets of planking are to be fastened to each other and to the transom frame with copper nails and roves. Excepting that the fastening to the outer moulded framing will be by brass screws.
The transom frame to be built from 1½ hard wood.
The transom floor to be moulded from 7"x3½" jarrah.
The transom to be fixed to the keel and hog by a grown knee, faced 4 inches, and extending about 24 inches along the keel, and about 30 inches high. To be fastened with two ½ inch and one ⅝" copper or bronze bolts through keel and two ½ inch and one ⅝" copper or bronze bolts through stern post and transom planking.
The transom cap to be fixed to gunwales with four ½" copper or bronze bolts through a pair of quarter Knees, faced 3 inches and with 18" arms.

8 RIBS

To be spaced seven inch centres and to be in two laminations of suitable steam bent timber, double dressed and sided 1"x2⅜" each.

9 PLANKING

The hull is to be carvel built with twenty one oregon planks on each side.
The planks to be finished 1⅛" full. Wedges to be placed between second plank, and garboards and the ribs.
Planks to be fastened to ribs with 3½"x8gauge copper nails and roves, except through wedges where 4½x8 gauge are required.
5"x6 gauge nails through hog rabbet.
Planks are fastened to transom frame by one row of 3"x9G copper nails and one row of brass screws.
Fastening to stem is by 3"x9 gauge copper nails.
Joints in planks to be well staggered, to occur between ribs and to have cover plates riveted inside between ribs.
Planks to be well caulked with cotton yarn and white lead putty.

10 STRINGERS

Two stringers on each side, to run full length of boat.
To be cut from 6"x2½" oregon.
The lower stringer to taper to 3½"x2½"@bow and 4"x2½" at stern.
The upper stringer to taper to 4"x2½" bow and stern.
The stringers are to be fastened through ribs and planks with 6"x6 gauge copper nails and roves.

11 BEARERS

Seventeen floor timbers spaced 2 feet centres, to be of jarrah.
Twelve to be faced 3½" and fastened through planks with ½" copper or bronze bolts spaced athwart ships 12 inch centres one or two ⅜" bolts through keel etc.
Five of these timbers to act as engine bearers and to be faced 6" and fastened with ⅜" copper or bronze bolts through planking, spaced 12" centres.
The engine bearers are to be set on two ribs, the space between the ribs to be filled with moulded oregon packing pieces.

12	ENGINE BEDS	Two jarrah engine beds running fore & aft, faced 4" x about 10" deep to be spaced 24" centres and moulded to suit engine. The beds are to rest on the engine bearers to which they are attached by five pairs of $\frac{5}{8}$" copper or bronze bolts.
13	COCKPIT DECK BEAMS	Cockpit floor bearers to be 2"x3" and spaced 18" centres. Beam centres supported on a 2"x3" stud standing on the hog. Short beams either side of engine to have inboard ends supported on a pair of 2"x3" joists running along side engine.
14	COCKPIT FLOOR	Planks to be 4"x1" T&G boards running fore and aft, fastened to deck beams with galvanized screws. Two loose hatches 20 to 24 inches wide to be left along centre line. Two 12" hatches to be provided wither side of engine.
15	GUNWALES	To be cut from 6"x2" oregon tapering to 3"x2" at bow and 4"x2" at stern. To be fastened through ribs and planking with 6"x6 gauge copper nails and roves.
16	SIDE DECKS	Side decks to be of $\frac{3}{4}$ seven ply bondwood. Side deck beams to be 2"x3" and spaced 15 inch centres. At every other beam a $\frac{1}{2}$" gal. iron tie bolt to pass through gunwale and carlin. $1\frac{1}{8}$x$\frac{3}{8}$ tread battens in 4'-6" lengths and running fore and aft to be screwed to deck with galvanized screws. Outboard side of decks to be fitted with 2"x2" toe rail in which waterways are cut every two feet. The toe rails to be bevelled 1"x1" on outer edge and tops neatly rounded. To be fastened with galvanized screws every 8 inches.
17	CARLINS	Carlins to be of 4"x3" oregon, and to run from the after bulkhead to the water tight bulkhead forward.
18	COAMINGS	Coamings to be of 6"x2" oregon, to run from after bulkhead to steering shelter, and across after end of cockpit. The coamings are to be capped with a protective strip of $1\frac{1}{2}$"x$\frac{1}{2}$" half round galvanized mild steel bar. To be fastened every 12 inches with galvanized screws.
19	BELTING	The belting to consist of 5"x2" oregon bolted through planking and gunwales with $\frac{3}{8}$" galvanized bolts, spaced 18" and an outer layer of $4\frac{1}{2}$"x$1\frac{1}{2}$" jarrah neatly rounded and capped with $1\frac{1}{2}$x$\frac{1}{2}$" half round galvanized steel bar, fastened every 12 inches with galvanized screws.
20	SIDE BENCHES & LOCKERS	The space under the side decks for a depth of 18 inches to be fitted as lockers. Front face to be of 3"x$\frac{1}{2}$" T&G lining and to be removable in 3 foot sections. Below these, and to deck level a set of side benches, about 20 inches high and 16 wide are to be built to house the fuel tanks. Inner vertical walls of 3"x$\frac{1}{2}$" T&G lining to be removable in 3 foot sections.
	FORE DECK & FORWARD BULKHEAD	The fore-deck to be built of $\frac{3}{4}$ seven ply bondwood and supported on three 3"x4" beams, half dovetailed to gunwales. The two after beams attached to gunwales with grown lodging knees faced 2".

21 FORE DECK & FORWARD BULKHEAD

The three beams to have a round-up of 5 inches in centre. The after one of the three to form top of water tight bulkhead. The bulkhead to be built of 3½"x⅞" T&G lining boards running at 45° to vertical and screwed to three 2x3 uprights.

A hatchway 14x24 inside measure with 2" coaming to be made in deck, and fitted with a removable hatch cover.

The hatch gives access to the fore peak where a shelf is to be provided for stowage of anchor line and mooring ropes etc.
The deck to be protected with six 1⅛"x⅝" tread battens spaced 6 inch centres and fastened with galvanized screws.

22 AFTER DECK & BULKHEAD

Deck to be of ¾ seven ply bondwood supported on three 3"x4" beams and the transom cap. The beams to be given a round up of 5 inches. The foremost of the three beams to be attached to gunwale with a lodging knee faced 2 inches.
Tread battens, spaced 3 inches to be screwed to deck.
The bulkhead to consist of three loose sections built of 4"x⅞" T&G lining. The centre section to be 3 feet wide.

23 STEERING SHELTER

To extend aft 5 feet from the cabin bulkhead at station 3. To have about 7 feet head room. The roof to be rounded 5 inches, to be of ¼ sevenply bondwood, covered with painted canvas, and carried on five 2"x3" beams supported by two 3"x3" stanchions either side.
A safety hand rail to run round outer top edge of roof.
A crutch block for mast to be fixed on centre line on after edge of shelter roof.
The cabin bulkhead to be built of 4"x⅞" T&G lining placed vertically on 2"x2" horizontal members.
A sliding door 21 inches wide and about 5'-5" high is placed on port side (about 18 inches off boat's centre line) to give access to cabin.
A 9" high steering platform 3 foot wide and 3'-9" long to be placed on starboard side against bulkhead.
A hatch 18"x16" covering a 14 deep recess for battery box to be made in platform.
The two central sections of shelter windows to open outwards. All other windows permanently fixed.
Shelter sides, above side deck level to be two 12x2 steam bent oregon planks, which are continuous with cabin sides.
A flag locker to be fitted on cabin bulkhead just to left of steering wheel.
A log book box to be provided on starboard, side near to wheel and two chart racks to be built in roof.
A steering grating about 22"x17" to be provided.
Screens for port & starboard navigation lights to be fixed on steering shelter roof, one each side.

24 CABIN

The space between forward bulkhead & cabin bulkhead to be fitted out as a cabin. About 8 feet long x 6'-5" head room. The cabin floor being about 9" below cock pit floor level, and carried on 2x3 floor beams spaced 18 inches. 12 inch wide loose sections to be left along centre line to give access to bilge.
The roof to be of ¾ canvas covered seven ply bond-

24 CABIN (continued)

wood, to be carried on eight 2½"x2" beams with a 5 inch crown.
Hand rails to run round edge of roof.
A 33" square skylight to be provided in centre of roof. To be in two sections hinges athwart ships and opening upwards. To be adjustable from inside the cabin. The glass to be reinforced with wire and protected on the outside with metal bars.
In the forward end of the cabin roof a 4 inch ventilator is to be fitted.
Cabin walls are a continuation of steering shelter sides, three port holes, spaced 3 ft. centres, are to be provided on each side. The forward ports to be size 4 inch, the next 5 inch and the after ones 6" diameter, all ports to open inwards.
Two built-in bunks or seats 17" high to run along cabin walls, to extend aft from forward bulkhead 6'-6" aft to be 17" wide forward to 26" wide aft.

In addition two pipe bunks, 6 ft long by 24" wide to be fitted, one on each side above the other bunks, and to be hinged so as to drop against walls.
The spaces between bunks and cabin bulkhead to be occupied by lockers. The lower ones to be 30" high and fitted with hinged double doors. The upper lockers to be about 20 high.
A folding table 4 ft long x 18" wide and 30" high to be hinged on forward bulk head, to be fitted with a folding leg to support it when in use.

25 CANVAS AWNING

A canvas awning to be provided to cover cockpit, top and sides. To be supported by 1" pipe stanchions set in cast bronze sockets, attached to inner side of coamings.
Rings to be set in side deck for lashing down side awnings.

26 DECK FITTINGS

A cast bronze stem head fitting, carrying a central bronze roller and two fairleads, to be securely fixed to forward end of deck.
Two cast bronze bollards one each side about seven feet from bow, to be fastened through gunwales with ½" copper or bronze bolts and, through the deck, and a 1½ packing piece spanning two deck beams with two ⅝ dia. copper or bronze bolts.

A 5"x5" jarrah mooring post fitted with pin to be set on hog and project 12" above foredeck, just off of hatchway. This post to be securely bolted to after side of the central of the three foredeck beams.

About 25 feet from the bow a pair of 5"x5" jarrah towing bitts to be fitted one each side. These bitts to be attached on their lower ends between two ribs, and to be securely bolted through, strapped and braced to coamings and carlins. To stand 16" above side deck level.

A pair of cast bronze fairleads to be fixed to transom, one each side. A pair of cast bronze bollards to be bolted with ½" copper or bronze bolts through the after deck beams.

27 MAST

The stump mast 4½" dia. to be stepped on the hog and pass through cabin roof to height of steering shelter roof. A bronze hinge to be fitted to enable the mast to lay back on shelter roof.
Mast to be 4½" dia. lower end and cut to be 16 feet high.

27 MAST (continued)

A six foot yard to be fitted 3 feet from top.
A $\frac{3}{8}$"x$\frac{3}{8}$" grove to run up after edge of mast to carry wires for mast head light wireing.

Chain plates to be attached to centre stanchion on either side of steering shelter and one to port of cabin.

28 LIGHTING

Power for lighting to be from 6 volt battery.
Two batteries to be housed in lead-lined box under steering platform.
Interior lighting as follows.
One light in roof of steering shelter.
One shaded light on instrument panel.
One light on cabin roof.
One "plug-in" point for lead light in steering shelter on port side.
One spot light to be provided on shelter roof in such a manner as to focus in any direction and to be controlled from steering platform.
One mast head signal light, switch on instrument panel.
Red and green port and starboard navigation lights to be mounted on roof of steering shelter.

29 BILGE PUMP

A hand operated geared centrifugal bilge pump "VORTEX" to be set on hog just forward of engine.
This pump is operated by a verticle crank passing through deck. When not in use handle to be stowed on cabin bulkhead.
The pump to discharge through a 1½" rubber hose connected to a bronze casting through planking.

30 FRESH WATER TANKS

Two fresh water tanks of about 55 gals capacity to be fitted under side decks on either side of steering shelter.
It is to be made of 18 gauge copper, well tinned on the inside to be fitted with suitable baffles and provided with a 2½" filling plug and a ½" tank tap.
A graduated dip stick to be provided.

31 ENGINE

The boat is to be powered with an 8 cylinder Chrysler Royal Marine engine Type R. M. 8 with a gear reduction ratio 4.48 to 1. To be mounted in engine beds and held by eight steel bolts passing through the beds.
A copper drip tray is to be placed under the engine and to occupy the whole space between the engine logs for full length of engine and gear box.
Cooling water is pumped in through a sand trap and discharged partly into the exhaust system, and partly overboard through the bronze casting set in planking.
The exhaust system consists of a water jacketed copper tube. 3" outer pipe 2¼ inner to the muffler thence 1 2¼" copper pipe lead along port side and out through the transom.
Engine to be controlled from an instrument Panel mounted above steering wheel box.
The panel to have the following instruments and controls.
One ignition switch.
One starting switch.
One engine choke button.
One horn button.
Four lighting switches.
One oil pressure gauge.
One amp. meter.
One rev. counter.

31 ENGINE INSTALATION

One shaded light.
One compass to be mounted on gimbals in box.
The throttle lever to be mounted beside the panel.
Auxiliary gear lever to be mounted along side wheel.

32 TAIL SHAFT & PROPELLOR

The tail shaft is to be a 2½" diameter aluminium or manganese bronze bar.
A white metal lined bronze water tight gland to be fitted on in board end of shaft log and a cast bronze white metal lined bearing outer end, this bearing to be lubricated through a ⅛" bore copper tube.
The after end of tail shaft to be supported in a water lubricated "Cutless" rubber bearing set in a Naval bronze strut between keel and skeg.
A three blade propellor cast in Naval bronze is keyed to the tapered end of shaft and secured by a castellated nut. The shaft taper to be 6" per foot.
Propellor's diameter 31 inches.
Propellor pitch 35 inches.

33 FUEL TANKS

Fire proof fuel tanks to be situated under side benches in cockpit. There are to be four tanks, two of 65 gals. and two of 52 gals. capacity.
One of each on either side.
They are to be made of 18 gauge copper and to be fitted with suitable baffles. ⅛" copper tube vents to be provided to carry fumes through side decks.
2½" filler plugs to be fitted and ⅛" gas outlet in each tent.
A dip stick, graduated on either side for the two sizes of tanks to be provided.

34 STEERING

Steering to be effected by a 24" dia. wheel keyed to a 1" dia shaft carrying a 4½" diamt. drum.
The whole supported on a galvanized iron bracket which is securely bolted to cabin bulkhead. 1 inch flexible steel cable to be lead over 4" bronze hinged pulleys mounted on cast brackets on upper starboard stringer, and through a pair of galvanized iron pipes to the stern and attached to the 18" radius quadrant which is keyed to the rudder post.
The rudder to be of cast bronze and fitted to the rudder post which passes through a water tight bronze gland in the keel and rests in a foot step bearing on the end of the skeg.
A tiller to fit over the square end of the rudder post to be provided for emergency.

35 COPPER SHEATHING

Below the waterline the outside of the hull is to be sheathed with 16 oz copper.
The sheets are to be fixed to the hull with ¾x12 gauge copper sheathing nails, spaced 1½ inches,
Sheets to lap at least ½ inch.
Before fixing copper the hull is to be given a coat bitumastic black and covered with tarred felt.

36 FINISHING & PAINTING ETC.

The outside of the hull is to be planed smooth and fair before painting. All nails and screws to be well counter sunk and the holes filled with white lead
All to receive a priming coa d oil paint.

FINISHING & PAINTING ETC.

Parts to be copper sheathed to be painted bitumastic black. All other parts except interior of cabin to receive one undercoat of gray paint and a finishing coat gray gloss.
Interior of cabin to be finished white.

37 EQUIPMENT

The following equipment to be supplied.
One spare propellor.
One spare taper propellor shaft, key and nut.
One "Cutless" rubber bearing.
Two 8 ft. boat hooks.
12 feet ⅝ chain.
One 35 lb C.Q.R. Anchor.
30 fathoms 4" coir rope.