W Falkland Islands 1731/1.

The above reference to be quoted on all correspondence relating to this matter.

Dated_____

____1924.

FALKLAND ISLANDS.

Contract

FOR THE

CONSTRUCTION OF A STEEL SCREW WHALE MARKING VESSEL

WITH

General Conditions, Specification and Form of Tender.

> FLANNERY, BAGGALLAY & JOHNSON, LIMITED, 9, FENCHURCH STREET, LONDON, E.C. 3. Naval Architects and Inspecting Engineers.

E. F. TURNER & SONS, 115, Leadenhall Street, London, E.C. 3.

Solicitors.

OFFICE OF THE CROWN AGENTS FOR THE COLONIES, 4, MILLBANK, WESTMINSTER, LONDON, S.W. 1.

an attempt at plotting whale movements on the Ocean for the Deason 1929/30. although the data supplied is very crude the point brought out, is that, undoubtedly, a series of cross movements exist fairly strongly. ag 5 15/6/31

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OFFICE OF THE CROWN AGENTS FOR THE COLONIES, 4, MILLBANK, WESTMINSTER, LONDON, S.W. 1.



This Indenture made the of 1924 Between

day of

registered office at

having its

(hereinafter and in the General Conditions and Specification hereto annexed referred to as "the Contractor") of the one part and THE CROWN AGENTS FOR THE COLONIES of 4, Millbank, in the City of Westminster, acting for and on behalf of the Government of the Falkland Islands of the other part.

WHEREAS it has been agreed between the said parties hereto that these presents shall be entered into by way of contract.

Now this Identure witnesseth as follows :--

1. FOR the consideration hereinafter mentioned the Contractor will construct and deliver free to the Crown Agents at

the Steel Screw Whale Marking Vessel with equipment and outfit for the same in accordance with the terms hereof, and (subject to the modification hereinafter contained) of the General Conditions and Specification hereto annexed (all of which are to be read and construed as part of this contract), and of any Instructions issued or given in accordance with the said General Conditions, and will also construct and equip all modifications, substitutions and additions by way of variation of and/or in substitution for and/or in addition to the work or any part thereof as the Crown Agents may from time to time and/or at any time require, and the Engineer shall order (in the manner in the said General Conditions, and in accordance with the said General Conditions, and in accordance with the said General Conditions, and in accordance with all such instructions as the Engineer shall from time to time or at any time issue and give to the Contractor.

2. The consideration payable to the Contractor (hereinafter called "the Contract Price") for the construction of the work, and of the obligations undertaken by the Contractor in Clause 1 hereof, and in the said General Conditions shall be the sum of \pounds

3. Payment of the Contract Price shall become due to the Contractor in instalments against the Certificate of the Engineer and will be made in four equal parts :---

> (a) One fourth when the keel of the vessel has been laid and the stem stern post frames and bulkheads have been erected in place, and the cylinders for the main engines have been cast and bored, and the materials for the boiler delivered at the Contractor's yard, and the shell of the boiler rolled.

(b) One fourth when all the shell deck and constructional work has been completed, and the hull bulkheads and all tanks have been tested by water in accordance with the Specification attached hereto, and when the main engines and boiler have been tested by water pressure, and the engines have been completely erected in the Contractor's shop.

(c) One fourth when the vessel has been satisfactorily launched, and the main engines, propellers, shafting, stern tubes and boiler are in position on board the vessel.

(d) One fourth when the vessel has been completed, equipped and tried in all respects in accordance with the Specification and has been delivered with all certificates in the Port of delivery.

4. Clause 27 of the said General Conditions shall be read and construed as if the words "£40 per week" had been substituted therein for the words "of one per cent. per week on the value of any work which may be in arrear."

5. The Contractor shall at any time on being called upon to do so by the Crown Agents supply all or any of the Spare Gear mentioned in the Schedule thereof attached to the Specification hereto annexed at the prices set out opposite to each item, but such prices shall be subject to any fluctuations in the rates of wages and/or cost of materials.

IN WITNESS whereof the Contractor has caused its Common Seal to be affixed and one of the Crown

Agents for the Colonies has hereunto set his hand and seal the day and year first above written.

THE COMMON SEAL of

Limited was hereunto affixed in the presence of

Directors.

Secretary.

SIGNED, SEALED AND DELIVERED by

one of the Crown Agents for the Colonies in the presence of

FALKLAND ISLANDS

REQUISITION No. 1731. CONTRACT No. 1.

Specification

FOR A

STEEL SCREW WHALE MARKING VESSEL.

PRINCIPAL DIMENSIONS.

Length between perp	endic	ulars			125 ft.	0 ins.
Breadth moulded					26 ft.	0 ins.
Depth moulded					14 ft.	6 ins.
Draft of water with 50 tons of coal an not to exceed	stear d 10 t	m up a cons of f	and st resh w	ores, ater,	13 ft.	6 ins.
Speed on trial, loaded	as abc	ove, not	less th	an 12	knots pe	er hour.

The vessel is intended for Research work, marking of Whales, steam trawling and other Marine Biological investigations in co-operation with s.s. *Discovery*, and will be employed in tropical and Autarctic regions.

GENERAL DESCRIPTION.

To have well curved stem and elliptical counter stern and well flared bows as in modern Whalers. Hull of Siemens Martin mild steel throughout.

To have three watertight and two oiltight bulkheads, and to have fore and aft peaks, crew space, officers accommodation, bunkers, engine and boiler space and ward room accommodation below main deck.

Main deck flush, of teak, all fore and aft.

Laboratory to provide in a teak house on main deck forward of boiler casing with combined Chart and Wheel house above.

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Separate bath and W.C. to arrange for Officers. Galley to build at aft end of engine casing.

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Pantry and a lamp room to be fitted in approved positions. Two W.C.'s, one for Crew and one for Petty Officers to arrange on main deck. Crew's wash-house also to provide.

Accommodation to arrange for two scientists and Master of vessel in separate cabins abaft engine space.

KEEL.

Forged bar type 7 ins. deep by $1\frac{1}{4}$ ins. thick, with large sluice openings in aft end as in Whalers.

STEM.

Of best forged iron 7 ins. by $1\frac{1}{4}$ ins., neatly rabbeted for protecting ends of shell plates, and half round on fore edge, and connected to keel in approved manner.

STERN POST.

Of best forged iron or steel 6 ins. by $3\frac{1}{4}$ ins. To have braces for rudder forged solid. Heel of post carried well forward to make efficient connection to keel plate. Rudder post $5\frac{1}{2}$ ins. by $3\frac{1}{4}$ ins. extended to main deck and secured to beams and transom plate.

RUDDER.

Of large area, semi-balanced double plate type with main frame and arms forged solid in one piece of best hammered scrap iron and boundaries rabbeted to receive plates which are to have flush edges. Space between plates to fill in with wood and bitumastic enamel. To have portable pintles. Rudder trunk to be fitted.

FRAMES.

Of bulb angle steel $4\frac{1}{2}$ ins. by $2\frac{1}{2}$ ins. by $\frac{6}{20}$ in., spaced 21 ins. apart, excepting for 18 frames at bow, which are to be spaced 18 ins. apart. All frames to extend from keel to deck in one length, except in way of oil bunkers. Frames butt jointed at keel.

REVERSE FRAMES.

Of angle steel $2\frac{1}{2}$ ins. by 2 ins. by $\frac{6}{20}$ in. or equivalent section, fitted on top edges of floors, and double under engines and boiler bearers or equivalent single angle fitted.

FLOORS.

Of steel plate 15 ins. deep by $\frac{6}{20}$ in. thick fitted on every frame, increased in depth and thickness under engines, and increased in thickness under boiler bearers.

Large drainage holes to provide. Floors and reverses under engines and boilers to be galvanized. Bulb to be cut off main frames in way of floors.

CENTRE KEELSON.

Of intercostal plates $\frac{6}{20}$ in. thick fitted between double continuous bulb angles 6 ins. by 3 ins. by $\frac{7}{20}$ in. worked on tops of floors.

BILGE KEELSON AND SIDE STRINGERS.

Of "T" bar or bulb angle 6 ins. by 3 ins. by $\frac{7}{20}$ in. riveted to reverse bars and wide angle lugs on frames.

Keelsons to extend as far fore and aft as practicable, and an additional keelson to fit forward for ice stiffening.

Alternative sections of keelsons of equivalent strength may be submitted if desired.

Beams.

Main deck beams of bulb angle steel 5 ins. by 3 ins. by $\frac{7}{20}$ in. fitted on alternate frames with bracket plate knees. Stanchions to fit to beams as required. Beams on every frame in way of openings, bunkers and winch. Lower deck beams of angle steel of approved section.

DECK STRINGERS.

Main deck stringer of steel 30 ins. wide by $\frac{6}{20}$ in. thick tapering to 20 ins. wide at ends, attached to sheer strake by an angle 3 ins. by 3 ins. by $\frac{6}{20}$ in. Deck plated full width in way of engines and boiler.

Waterway 12 ins. wide formed in main deck and suitably covered where required.

TIE PLATES.

Of steel plate, fitted in way of all openings, 6 ins. wide by $\frac{6}{20}$ in. thick.

Beams to be plated in way of oil fuel bunkers, deck machinery and bollards.

BULKHEADS.

Of steel, three watertight and two oiltight, and well stiffened vertically and horizontally in approved manner. Wide liners to fit in way of outside strakes.

SHELL PLATING.

Of Siemens Martins mild steel. Sheer strake 40 ins. wide by $\frac{3}{20}$ in. thick, extending one foot above gunwale. Garboard strakes $\frac{3}{20}$ in. amidships to $\frac{7}{20}$ in. at aft end. Romainder of shell $\frac{7}{20}$ in. thick amidships to $\frac{6}{20}$ in. at aft end.

Longitudinal joints double riveted, butts flush and double riveted down to upper turn of bilge.

Butts and edges of all plates to be planed.

Shell plating to be doubled forward for a fore and aft length of 35 ft., and a depth not less than 8 ft. One strake at water line to be doubled all fore and aft.

BULWARKS.

Of steel plate $\frac{5}{20}$ in. thick all fore and aft, properly stiffened and stayed, standing about 3 ft. high above gunwale.

Large freeing ports, mooring pipes and other openings to fit as required, and plating doubled in way. Heavy teak rail 7 ins. by $3\frac{1}{2}$ ins. to fit all fore and aft.

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GUN STIFFENING.

To provide at stem head so that a harpoon gun can be fitted at a later date if required.

BUNKERS.

About 100 tons capacity for coal and 125 tons for oil fuel, to arrange in cross bunker forward of stokehold bulkhead, and alongside boiler, and suitable for oil and coal.

Centre line bulkhead to be oiltight.

Plate edges and butts double riveted, all oiltight pitch.

To have most modern and convenient arrangements for filling the bunkers and serving the boilers.

Syphon pipes to fit, with lock cocks and funnel ended pipes led to nearest oil well, so arranged that water can be drained from bottom of bunkers and run into oil wells for pumping overboard. Six circular oiltight scuttles to be fitted of special design, galvanized throughout and fitted with gratings.

Bolted oiltight doors to fit on each side, and to facilitate conversion for using coal fuel.

To have ventilators with oiltight coamings.

Oiltight wells to arrange forward and abaft the cross bunker.

Sounding and air pipes to fit.

Plan of bunkers and fittings to specially submit.

Heating coils, 2 ins. bore, to fit throughout oil bunkers and round suction strums, and kept below tops of floors to enable wood ceiling to be fitted for carrying coal when required without damaging pipes. Ceiling 2 ins. thick, and portable, with provision for stowing when out of use.

Valves to fit so that each compartment can be heated separately or completely isolated. Heating system on separate line from boilers passing through a reducing valve with return steam exhausting into an inspection tank in Engine room, with connections to feed tanks and alternately to bilges.

Inspection tank to have gauge glass and escape pipe.

All pipes 1 in. thick with flanged connections and carefully clipped.

All Lloyd's and Board of Trade requirements for oil fuel carrying and burning to be provided.

Oil fuel bunkers to be calibrated, and scale to be supplied including graduated sounding rod.

Emergency oil fuel tanks to supply and fix alongside engine castings, having not less than 20 tons capacity, for use on long passages.

RIVETING.

To be equal to Lloyd's requirements throughout, shell riveting left full and well countersunk. All holes to be reamered fair.

ENGINES AND BOILER SEATINGS.

Of steel plate to suit Engineer's requirements, and of sufficient strength for the machinery to be fitted. Holes to be drilled in position before riveting.

Detail plan to submit.

ENGINE AND BOILER CASINGS.

Of steel plate, standing about 5 ft. above main deck, and extended aft for galley, steering gear and engine room entrance.

Top and side plating $\frac{4}{20}$ in. thick and suitably stiffened. Coamings of steel plate $\frac{5}{20}$ in. thick, well secured to beam ends, and standing 18 ins. above deck. Radius plate to fit at junction of top and sides, and all corners to have large radius.

Port-lights to fit in casing sides with dead-lights.

Gratings and storm covers to fit on top of casings as required. Guardrails and stanchions to fit on casing tops.

SKY-LIGHTS.

A large galvanized steel sky-light with plate glass sashes, arranged to lift, with brass quadrants for holding them open, to be fitted for ventilating engine room.

A neatly finished teak sky-light to fit over dining saloon, and a galvanized steel sky-light over mess room, both of specially strong construction with heavy coamings, cut to radius at deck.

All sky-lights to be readily removable.

Brass guards to fit to all sky-lights.

DECKS.

Main deck of Moulmein teak $2\frac{1}{4}$ ins. thick and 4 ins. wide secured by galvanized bolts and nuts and dowelled. Seams to be well caulked with oakum and payed with Jeffrey's marine glue.

Decks to be stiffened as required in way of heavy weights.

Floor in living rooms below main deck of pitch pine 2 ins. thick, tongued and grooved.

Scuppers to arrange in main deck.

Ceiling.

On floors of pitch pine 2 ins. thick tongued and grooved and fitted with limber boards.

LABORATORY.

To be built of Moulmein teak at forward end of boiler casing, constructed in two 1 in. thicknesses. The inner thickness being laid diagonal and the outer thickness vertical with felt and white lead between, both thicknesses clenched together with closely pitched copper fastenings. Coamings not less than 6 ins. wide with double rabbets for receiving planking. Stiffening to be specially strong and well secured with brass stay rods through top and bottom coamings, and coamings to be bedded on beams and dovetailed at corners. All fastenings to be of brass or copper. No iron screws or fastenings to be used.

To be fitted up in pitch pine with sink and fresh and salt water supply, shelves, lockers, drawers and other fittings as required for Biological purposes and scientific gear.

Stools, tables and other furnishings provided as required for the Scientific staff.

Port-lights as numerous as practicable, all 14 ins. diameter gunmetal, to fit in sides and fore end. To have large brass flanges and dead-lights.

Doors to fit on both sides of house.

ACCOMMODATION.

Ward-room accommodation to be arranged below main deck aft and fitted up in first class manner for Captain, Chief Engineer and two Scientists.

A comfortable ward-room also to be provided, neatly finished.

All cabins, ward-room and mess-room to be suitably furnished and upholstered.

Four double berth cabins to arrange below main deck forward, these being fitted up in suitable manner for Officers.

Each cabin to have folding lavatory, seat, desk and drawers, bookcase and other usual fittings.

A well appointed mess-room also to be provided. Corticine to fit on all floors and curtains and rods to berths.

Two store rooms to arrange, one each side of lobby for Scientific stores.

Crew's accommodation to arrange below main deck forward with bunks, table, seats and lockers, hat and coat hooks to approval.

All woodwork throughout to be secured by brass screws.

INSULATION.

Undersides of decks, bulkheads and sides of vessel in all living spaces to be suitably lagged with asbestos 1 in. thick, retained by matchboarding and panelling to ensure comfortable living conditions in Antarctic waters.

BATHS AND W.C.'s.

Bathroom to arrange on port side below deck aft, and bath to be supplied from sanitary tank, and to have a shower fitted.

Bathroom to have seat, wash basin, damp-proof mirror, bottle and glass racks and towel rails. Steam heater to be fitted.

Fresh and salt water supplies to provide throughout.

Two W.C.'s to arrange in suitable positions, and of Shank's or other approved make and pattern, for Officers and Crew.

Floor of bathroom and W.C.'s to be tiled and fitted with gratings.

CHART-HOUSE AND WHEEL-HOUSE.

To construct of teak on top of laboratory, to have rectangular sliding windows, teak storm shutters and two doors.

All usual fittings to provide including flag locker, folding chart table, settee, folding lavatory and other usual fittings.

Floor, to cover with corticine.

Brass quartermaster to fit, steering pedestal to fit in this house with teak wheel and usual fittings. Control rods and gears to be brass and carefully led and protected.

HEATING.

An approved system of heating accommodation by steam to be provided with copper steam pipes and flanged connections, all returning to feed tank in engine room, and to have ample shut off valves.

RING AND KNOB FURNITURE.

Of brass throughout including hinges and similar fittings.

GALLEY.

Galley to be constructed at aft end of engine casing, to have large well insulated range, specially selected for fuel economy, dresser, sink, coal box, racks, and shelves, cupboards and complete equipment of cooking utensils.

Floor of galley to be tiled.

Doors and port-lights in galley ample for good lighting and ventilation. Steel sky-light to fit with opening flaps.

Lift to be fitted leading to pantry.

A large copper water boiler, tinned inside, to fit in base of funnel with good filling arrangements and draw off cocks.

Emergency galley coal stowage to provide.

WIRELESS CABIN.

Of steel on top of engine and boiler casing, floor and sides to be well insulated, roof to be teak.

Cabin to be neatly and comfortably fitted, as required, by Makers of installation with chair, settee, desk, drawers, silence chamber and all details.

AWNINGS.

Of strong canvas to provide for fore deck, pilot and navigating bridges. Stanchions to be wrought iron, portable. Ridge ropes, spreaders and all details to supply as required. Stanchions on Bridges of gunmetal.

NAVIGATING BRIDGE.

Of teak on top of laboratory with narrow deck extending to each side of vessel, and well rounded at fore side.

PILOT BRIDGE.

To arrange on top of Chart-house, of teak, with forward end extended beyond house to level of Navigating Bridge for fitting standard compass.

Canvas weather cloths, awnings and dodgers to fit to both Bridges.

COVERS.

Canvas covers to fit to all boats, winch, capstan, steering wheel, skylights and other exposed deck fittings.

DECK-LIGHTS.

Circular glass deck-lights 8 ins. diameter to fit.

Officers' and Engineers' cabins in number as required, and deck suitably compensated in way. Glass to be flush with deck.

Similar scuttles to fit to bath, W.C.'s, etc.

Deck-lights to have two thicknesses of heavy plate glass with 4 ins. clearance between, with dead-lights on undersides. These deck-lights to have gunnetal frames and to be in number and disposition as required for good lighting and kept reasonably clear of obstructions.

Provision to be made for removing deck-lights when required, and fitting galvanized cowl ventilators, with brass rims and brass screw adapters.

No lights to be fitted in sides of vessel.

LAMP ROOM.

To fit on main deck, with all necessary shelves, lockers and drawers, of galvanized steel, and hooks and other fittings. A save-all to fit for trimming lamps.

FRESH WATER TANKS.

Two in number, each having a capacity of not less than 400 gallons, to have air and filling pipes complete, with gunmetal plates on deck.

Tanks to have large manholes accessible at all times.

A sanitary tank of about 130 gallons capacity to fit on boiler casing, and supplied by steam and hand-pumps with deliveries to baths and W.C.'s. Tanks to have pads or doublings in way of fittings and openings.

Overflows led into approved positions.

Tanks to be galvanized throughout.

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VENTILATION.

Good ventilation to provide in all parts of vessel. Side houses and W.C.'s to have mushroom ventilators. Large mushroom ventilators to fit to Officers and Engineers cabins and crew space.

Large cowl ventilators to fit to engine room, stokehold and ward room.

Stokehold ventilators to have doors and ash hoists fitted.

Ventilation to be so arranged as to be suitable for tropical or cold climate.

RUBBING FENDERS.

Of convex steel, two in number, at level of gunwale all fore and aft, and in other special parts for guarding against chafe of gear as may be required.

MASTS AND RIGGING.

Two pole masts to be fitted, having gaffs for trysails. Foremast to be specially strong so that it can withstand strains to be encountered in whale catching service if required. Square sail and 30-foot yard to fit on fore mast with all gear complete. Stowing position for this yard to arrange on deck. A suitable boom to provide for fitting to foremast gooseneck for general purposes, including handling stores, and to have all blocks and gear complete.

Standing rigging of best galvanized steel wire, set up with box pattern screws and mizen rigging to be set up to galley top. Running rigging of best Manilla, complete with blocks and fittings and rove ready for use.

To have fore and main trysails and fore and main stay sails, all of navy canvas of suitable numbers. A substantially constructed crows nest to fit on fore mast with ladder for access above and below. Masts to be fitted with extended topmasts, if required, for wireless purposes.

Accumulator spring to fit at foremast for taking shock off dredging wires and to stand a strain of five tons.

RING BOLTS.

Eyeplates and cleats to fit in handy positions about decks to facilitate lashing, especially in way of fore deck and to suit trawling.

HANDRAILS AND STANCHIONS.

To fit all round Navigating bridge and roof of Chart house, 3 ft. high to underside of wood rail.

Lower rails of brass and top rails of teak.

Handrails and stanchions to fit at Marksman's platform forward, round engine and boiler casing tops and elsewhere as necessary.

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LADDERS.

A teak accommodation side ladder to supply to suit each side of vessel, with leather fenders and other fittings as required.

Teak ladders to Navigating and Pilot bridges, to have teak handrails. Ladders to crew space and lower deck cabins of pitch pine.

Engine room, stokehold and other compartments to have suitable ladders.

PUMPING ARRANGEMENTS.

A main suction line to fit, connecting steam pump in engine room with each of the principal compartments. Branches led to a gunmetal valve box in a convenient position to engine room. Four 4-in. brass deck pumps to fit in suitable positions, with gunmetal deck plates.

All bilge suction pipes of galvanized iron, with flanged connections throughout, and to have rose boxes. Branch pieces to fit where pipes pass through structure. A semi-rotary hand pump to fit with $1\frac{1}{2}$ ins. suction, for filling sanitary tank.

Where bilge pipes pass through oil fuel bunkers special provision to be made to guard against leakages.

Two semi-rotary hand pumps to fit near galley, one with suction from fresh water tank and one for salt water supply.

All above pumps of gunmetal throughout with suction pipes and roses of galvanized iron.

Sounding pipes to fit to all compartments, and to have gunmetal deck plates.

Special attention to be given to draining in frosty weather, and pipes led to suit.

BOILER FEED TANKS.

To construct alongside boiler abaft bunkers, and about 8 tons total capacity.

To be capable of being filled from sea or deck, with connections for supplying boilers and other detail connections necessary. Doublings and pads to fit to approval.

Tanks easily accessible for cleaning and examination.

STEERING GEAR.

A steam steering gear to fit, in a convenient position in engine room casing, of Reid's make, controlled from Navigating bridge.

Steering chains and rods led over brass bushed sheaves and rollers, to quadrant on rudder head, and fitted with necessary stretching screws. A standby right and left hand screw steering gear to be fitted at rudder head.

Quarter and other large sheaves, self oiling, and all leads easily accessible. Tiller to have relieving tackles, eyebolts, etc.

STEAM TRAWL WINCH.

To be of the most improved and up-to-date single purchase type, made throughout of the best material and workmanship, and to be specially adapted for deep sea trawling. To have two independent barrels, each of which are to be capable of holding 1,000 fathoms of trawling warp. The barrels, with strong flanges to fit, arranged to work in conjunction with each other or separately, and together with warping ends to specially arrange to suit Biological purposes.

To have large cylinders suitable for working at a pressure of 180 lbs. per square inch. The sole plate to be of cast iron and of box section.

Frames of cast steel and well fixed to sole plate and securely stayed.

Shafting of forged steel with squares in way of sliding clutches.

Brake to fit to each barrel with wrought iron bands lined with hardwood and worked with right and left hand screws, fitted with convenient hand wheels.

Gear to be fitted for regulating ropes on barrels as they are hauled in or payed out.

Spur and pinion wheels to be helical machine cut. Spur wheels in bolted halves all machine cut and of cast steel throughout, fitted with brass bushes and liners throughout. Suitable warping drums to fit at each end of the main shaft.

All bearings gunmetal and adjustable. Piston rods and valve spindles bronze.

The reversing gear to fit with lever, etc., complete, and carried on strong brackets. Link gear of specially heavy type.

Oil pipes to fit for easy and efficient lubrication.

Deck beams under the winch to be specially supported with pillars.

Winch to be firmly fixed on a pitch pine bed, and secured with holding down bolts of sufficient size and number.

A large storage reel suitable for stowing 6,000 metres of $1\frac{3}{8}$ ins. wire to be fitted near to and driven by trawl winch in approved manner.

GALLOWS.

To fit on port side forward and aft suitable for working full sized commercial trawl and positions to be decided later. Sheaves to have heavy brass bushes, and the gallows to be strongly secured and stayed. All gear to test on completion.

CAPSTAN.

Of single and double purchase steam and hand type with cable lifter at base of capstan for dealing with vessel's anchors and cables. Engine of strong construction with bronze piston rods and valve spindles, heavy link gear,

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gunmetal adjustable bearings, machine cut gears and otherwise strong and well finished. In event of worm wheel being fitted the rim to be bronze, bolted to centre and machine cut.

Engine to be well covered and protected against weather.

LUCAS SOUNDING MACHINE.

To be fitted on starboard side of fore deck in approved position. To be large type and steam driven. Adjacent to the above machine and driven by the same steam engine, a hydrographic reel is to be fitted suitable for 6,000 metres of 5 mm. wire.

Above all to be carefully bedded and provided with necessary steam and exhaust fittings and controls.

PLANKTON REEL.

A reel to be fitted in approved position on starboard side suitable for 6,000 metres of 7 mm. wire, and to be driven by a Brotherhood or equal approved steam engine with all connections and details complete.

Sounding Platforms.

To construct of teak on fore deck in agreed positions with chains, bellybands and all usual fittings.

ELECTRIC INSTALLATION.

Vessels to be lighted by electricity throughout, including Officers' accommodation, laboratory, crew space, engine room, stokehold, store rooms and all compartments throughout vessel. Power also to provide for wireless installation and searchlight. Special lights and lamps to provide for use in laboratory.

Side, mast head, stern lights, compasses and telegraphs to fit for electric light and oil, navigating lamps 32 c.p., compass and telegraph lights 10 c.p. A sufficient number of ordinary lamps to fit in convenient positions for lighting up decks.

Two cargo clusters to supply of 80 c.p. each, and each to have portable cable and four connections, two forward and two aft. A 16-in. diameter projector to fit on Pilot bridge, to be in accordance with Admiralty requirements throughout, with automatic regulating gear and other modern details.

A self-contained direct coupled enclosed type compound engine and multipolar dynamo by an approved maker to be provided, with marble switchboard, of latest approved pattern with all connections easily accessible, and all necessary fittings and instruments.

Steam to supply to engine from main boiler by a separate connection, and exhaust led direct to condenser by means of separate pipe, with change over cock to waste steam pipe. A 12-in. electric fan to fit in each living compartment, including crew's quarters.

Wiring throughout on the double wire system. Installation, wiring, fittings and materials to be equal to Admiralty requirements throughout.

Connection boxes to be kept in sheltered accessible positions as far as possible.

A six hours full load trial of whole installation to carry out to entire satisfaction of the Naval Architects and Inspecting Engineers on completion.

Detail specification to submit for approval before work is begun.

STORM RAILS.

Of teak, in brass fittings, to fit to casing sides and other places wherever practicable.

WIRELESS.

A Marconi or equal approved $1\frac{1}{2}$ k.w. Wireless set to supply and instal on most modern lines with equipment and all details complete and satisfactorily tested before acceptance.

AUXILIARY STEAM AND EXHAUST PIPES.

Of solid drawn copper, carefully lagged, and led under main deck where practicable.

All auxiliary exhausts throughout vessel led to main condenser with change over cock to waste steam pipe and shut off valves at each auxiliary.

Gummetal Branches to fit where pipes pass through structure.

Anchors, Chains and Ropes.

The following to be supplied with all gear necessary for working same :—

Two 8 cwt. stockless anchors of approved make stowed in suitable positions, with slip bolts and other gear for working.

One $2\frac{1}{4}$ cwt. stream anchor and 45 fathoms $\frac{14}{16}$ in. short link chain.

Two 75 fathoms lengths of $1\frac{1}{8}$ ins. stud link cable, complete with anchor and joining shackles, senhouse slips, etc.

One 60 fathoms length of $2\frac{1}{2}$ ins. galvanized flexible steel wire rope with reel fixed in convenient position.

Two 60 fathoms 6½ ins. Manilla rope One 60 fathoms 5 ins. Manilla rope

All on wood stowing reels.

60 fathoms 5 ins. Coil hawser. \int Two 120 fathoms coils $2\frac{1}{2}$ ins. Manilla.

60 fathoms heaving line.

1 coil flag halyard line.

ANCHOR DAVITS.

To supply on forecastle head with steel blocks fitted with brass sheaves, falls and catting gear complete.

LAMPS.

Two complete sets of copper signal lamps including mast head lights, and stern light. Screens and mast head halyards to be fitted, all lamps to have dioptric lenses, spare set fitted for Kerosene and working set for electric light, all to Board of Trade requirements.

Oil and electric lamps of suitable pattern for intended use, to supply for deck, cabins and all other departments of vessel.

Three globe hand lamps to supply.

A spare chinney to supply for each lamp so fitted, together with a sufficient quantity of wick for the lamps.

BOATS.

Two carvel built teak lifeboats, each 20 feet long, suitable for 20 persons. Boats copper fastened and fitted with copper tanks, and one 12-ft. carvel built teak dinghy to be supplied, each lifeboat furnished with sails and complete outfit to Board of Trade requirements.

DAVITS.

Boats to be housed in davits at casing sides and to be kept clear of rails and provided with guys, galvanized steel blocks and gunmetal sheaves and falls complete. Chocks, falls for lowering davits and other fittings to supply. Two davits to fit in approved positions for dealing with Plankton and Hydrographical reels.

GRATINGS.

To fit at steering positions, in bath rooms and W.C.'s, at stern of vessel, and elsewhere as required. A teak platform grating to fit at how for Marksman and to have hand rail round same.

HAWSE PIPES, BOLLARDS AND FAIRLEADS.

Large pedestal type trawler fairleads to fit on fore deck in number and position as required for working trawl warps.

Two fairleads to be graduated for Registering amount of warp from each drum.

Mooring bollards and fairleads to fit in useful positions forward and aft on each side of main deck, secured in approved manner. Two roller fairleads to fit at quarters for taking small lines.

Two large sheaves to fit in bows of vessel suitable for taking whale lines, and specially arranged for vessel's cables.

CHAIN LOCKERS.

Of pitch pine at forward end of vessel in two sections of ample size to admit of easily stowing all cable.

FLAGSTAFFS.

Of teak fitted at each end of vessel with halyards and neatly gilded trucks.

NAME.

Name of vessel to be placed on stern and each bow in gunmetal or white metal letters.

GALVANIZING.

The whole of the engine and boiler casings, steel deck coamings and all iron and steel deck fittings to galvanize by hot process, before fitting.

PAINTING.

The whole of the steel and iron work to have three coats of red lead or other approved paint inside and out. The bottom outside to have three coats approved anti-corrosive and anti-fouling composition, which is to be applied after vessel is launched and a few days before official trials.

All costs of docking or slipping for this work to be included in Tender.

Teak deck houses, rails and other hardwood work and fittings to varnish three coats. Roofs of deck houses and cabins inside, to be painted white. All cabins and crew space below deck to paint three coats white paint except pitch pine furnishings, which are to be varnished.

Topsides to be coated black with white at water line, steel work of engine and boiler casings inside and out to be painted white.

Funnel and ventilators to paint cream colour with red cowls.

CEMENTING.

The whole of bottom inside vessel, up to lower turn of bilge to cover with best Portland cement, well over frame rivets and finished so as to drain water off easily. Care to be taken that all limber and drain holes are clear for water in bilges to flow freely to suctions.

Special parts to cement as required.

TESTING.

All steel used in the construction of the vessel to test to Lloyd's requirements at Contractors expense.

Anchors, chains and wires, for ropes and rigging, to test.

All Certificates of tests to be handed to the Naval Architects and Inspecting Engineers.

Butts and seams of shell and bulkhead plating to test by hosing. Fore and aft peaks to test by filling to deck level, all tests to be made before painting.

All fresh water and feed water tanks to test with an 8-ft. head of water. Oil fuel tanks and bunkers to test to Lloyd's requirements.

DRAWINGS.

Before proceeding with the work, general and detail drawings of ship and machinery are to be prepared by the Contractor at his own expense and submitted to the Naval Architects and Inspecting Engineers, and any plans required by the Naval Architects and Inspecting Engineers during the course of the work are to be supplied as part of the Contract. On completion four sets of fully dimensioned plans of the work as actually constructed are to be supplied, one set being tracings on cloths and the other three being velograph prints on tracing cloth.

These plans to include, among others, a complete general arrangement of the vessel on approved scale, showing longitudinal and cross sections and deck plans, also outside view of steamer with sails, deck fittings, and all details, pipe arrangements, details of machinery, curves of displacement, centre of buoyancy, midship section areas, metacentres and tons per inch.

STABILITY.

Vessel to be inclined for stability in presence of the Naval Architects and Inspecting Engineers and curves of statical stability to supply for three conditions before vessel is delivered.

Model.

A neatly finished French polished full model made to a scale of $\frac{1}{4}$ in. to the foot to be supplied on completion, showing all deck fittings and details as constructed.

GENERALLY.

This Specification is intended to include all usual requirements for a vessel of this class, and all work specified is to be considered and carried out with a view to specially adapting the vessel to contend with tropical and Antarctic conditions so far as is practicable.

Any reasonable modifications in the arrangements of design desired to be made before the work on same has been commenced are to be carried out without extra cost.

In the design and construction of the vessel generally, all special provisions necessary should be made, so that on completion of the Research Service for which she is intended she will be readily convertible into a Whale Catcher.

EACH SLEEPING CABIN to be provided with :--

Hoskins 30" wire mattresses.*

- 1 hair mattress.*
- 1 camp stool.*

2 quilts.*

1 small folding table.

Mats as required.*

- 1 japanned water can (large).*
- 2 mattress covers.*
- 2 pillows, best.*
- 4 pillow cases.*
- 6 blankets.*
- 2 pairs best linen sheets.*
- 1 book shelf.*
- 1 lifebelt.*
- 1 hot water can.*

Nore.—Double berth cabins to have items marked * doubled.

OUTFIT.

- 1 10" brass signal bell on foremast with vessel's name and date engraved.
- 1 teak meat safe.
- 1 harness cask with brass hoops.
- 8 teak deck buckets, brass hooped fitted in teak stands.
- 8 lifebuoys and lines with vessel's name painted to hang on wide hooks on rail. All to Board of Trade with lights as required. 2 hand leads and lines 20 fathoms each, properly marked.

1 deep sea lead line and reel.

1 Patent Cherub log and line, fitted aft.

1 log line and propeller.

2 galvanized iron boat hooks with long ash staves, stowed.

6 squeegees with handles.

- 6 paint scrubbers with handles.
- 2 bannister brushes.
- 6 deck scrubbers with handles.

6 deck brooms with handles.

- 1 full set of carpenter's tools, in lock up box, value not less than £10 nett. List to supply with Tender.
- 4 windsails (canvas) with ash hoops.

2 lengths of copper riveted leather hose to reach any part of vessel and fitted with gunmetal couplings for casing side connections and gunmetal nozzles.

Lifebelts for whole of crew.

4 hair brooms with handles.

4 blacklead brushes.

6 holystones with 2 frames.

6 triangular deck scrapers.

- 6 mops with handles.
- 6 paint pots (1 quart).

12 paint brushes (assorted).

8 14" cork fenders with ropes.

4 galvanized iron buckets.

I wood water funnel.

4 chain hooks.

1 serving mallet.

2 serving boards.

6 marline spikes.

1 wood fid.

1 grindstone and trough.

1 brass signal gun on bridge deck.

1 mechanical fog horn.

2 speaking trumpets; 1 large, 1 small.

1 10" Kelvite standard liquid compass in binnacle on pilot bridge.

1 Kelvite steering compass and binnacle aft, liquid 8".

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1 Kelvite steering compass in wheel shelter, liquid 8".

- 1 pair Ross binoculars in box on rail near steering position, 12 magnification.
- 1 japanned box for ship's papers.

1 Aneroid barometer.

- 1 chronometer with Kew Certificate. Fitted in suitable box with lock and key in chart house.
- 1 English lever eight-day clock, value not less than £10 nett to approval for ward room.

1 English lever eight-day clock for laboratory.

1 English lever eight-day clock for chart house.

4 blue ensigns with badge of Colony.

2 Jacks.

2 Burgees with vessel's name.

1 Blue Peter.

1 small and 1 large set code of international signals with books.

4 canvas buckets with lines.

2 crowbars.

3 sets of caulking irons for decks.

3 caulking mallets.

1 cwt. oakum.

1 pitch pot and ladle.

2 cwt. Jeffreys marine glue.

3 red globes.

1 tinned funnel.

3 black shapes.

2 sounding rods.

12 blue lights.

12 rockets and sticks.

12 spare glasses for circular deck scuttles.

24 spare rubber rings for circular deck scuttles.

12 pieces glass suitable for deck skylights.

6 camp stools.

2 oil cans.

1 oil filter.

2 pairs lamp scissors.

2 pairs can hooks.

2 slings for cargo.

1 portable 4" Downton hand pump and suction hose complete.

2 luff tackles, 6 in. blocks, 15 fathoms $2\frac{1}{2}$ " fall each.

2 12" snatch blocks.

2 relieving tackles.

2 cwt. red lead.

2 cwt. A.F. composition.

2 cwt. black paint for topsides, mixed.

1/2 cwt. cream paint, mixed for funnel, etc.

28 lbs. driers.

15 gallons boiled oil.

10 gallons turpentine.

10 gallons varnish.

4 teak deck planks, $2\frac{1}{4}$ by 20-24 ft. long.

1 teak board 16 ft. by 18" by 1".

CUTLERY, WARD ROOM.

18 table knives Stainless, with plated

12 cheese knives handles.

2 pairs of meat carvers.

2 steels.

18 table forks, large.

18 table forks, small.

18 pairs fish knives and forks.

2 soup ladles.

2 sauce ladles.

9 table spoons.

12 soup spoons.

18 dessert spoons.

18 tea spoons.

12 egg spoons.

4 salt spoons.

NOTE.—Suitable boxes to provide for properly stowing cutlery.

GLASS (SALOON).

4 wine decanters with stoppers.

18 soda water tumblers.

18 tumblers.

18 sherry glasses.

12 port glasses.

12 claret glasses.

12 champagne glasses.

12 liqueur glasses.

4 water bottles.

2 pickle jars and covers.

4 salt cellars, large.

12 custard glasses.

9 glass dishes, assorted.

2 sugar basins.

2 bowls for sifted sugar.

4 preserve dishes, double.

4 butter dishes.

All glass of first quality and Colonial Badge engraved. [240938]

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All to have Colonial Badge.

CHINA AND EARTHENWARE (SALOON).

 $\mathbf{20}$

18 soup plates.

- 24 dinner plates, large.
- 24 dinner plates, medium.
- 18 cheese plates.

12 salad plates.

- 6 meat dishes, assorted sizes.
- 2 salad bowls.
- 2 cheese stands.
- 18 breakfast cups and saucers.
- 18 teacups and saucers.
- 18 coffee cups and saucers.
- 18 breakfast plates.
- 18 tea plates.
- 4 cake plates.
- 18 egg cups.
- 8 pie dishes, assorted sizes.
- 6 pudding bowls.

NOTE.—China and earthenware to be of first quality and to have badge as directed by the Crown Agents.

TABLE AND BED LINEN, ETC.

- 2 sets Holland covers for sofa seats and chairs.
- 2 cloth table covers, each table.
- 1 American cloth cover, each table.
- 6 damask table cloths.
- 24 table napkins.
- 24 towels.
- 12 bath towels.

PANTRY FURNISHINGS.

4 double block tin dish covers, assorted sizes.

6 tea trays, assorted sizes.

2 bread trays.

- 1 bread platter and knife.
- 1 crumb brush and tray.
- 2 knife trays, double.

1 plate basket.

- 1 plate brush.
- 1 cork mat for bathroom.
- 1 dinner gong.
- 1 dinner bell.
- 18 napkin rings, numbered.
- 2 Berkefeldt filters, large.
- 1 pair wood salad servers.

MISCELLANEOUS.

1 Salter's spring balance, 56 lbs.

2 japanned tin candle boxes.

4 cork screws.

2 double ink stands.

2 tin funnels.

2 sets of shoe brushes, each set in box.

2 clothes brushes.

2 slop pails, enamelled iron.

2 sets of dinner mats.

2 dusting brushes.

2 banister brushes.

2 dustpans.

24 glass cloths.

24 knife cloths.

24 dusters.

24 pantry cloths.

12 chamois leathers.

12 selvyts.

CREW.

12 wool mattresses.

24 covers for ditto.

24 pairs blankets.

12 pairs knives and forks.

12 enamelled iron plates.

12 enamelled iron basins.

12 metal spoons.

12 drinking cups.

Stowage to be provided in lockers, racks, etc., as may be found practicable, for all items of Glass, Earthenware and other details of Inventory specified above.

Linen, bedding, cutlery and similar items all to have Colonial badge as instructed by the Crown Agents.

MACHINERY

SPECIFICATION.

The engines and boiler to be designed and constructed throughout in accordance with the best practice and well finished.

All working parts adjustable, and all bearings throughout to have extra large surfaces, as it is of utmost importance that the engines should be capable of working for long periods without adjustment.

ENGINES.

Of triple surface condensing type, and of sufficient power to propel the vessel at the contract speed of 12 knots.

Constructed throughout in the best manner and of the best materials, which must comply with Admiralty Requirements and Standard of Tests.

CYLINDERS.

Of hard close grained cast iron of suitable diameter and stroke, truly bored and otherwise machined and arranged with suitable slide valves. All neck bushes of gunmetal.

Suitable escape valves, drain cocks, pass, and starting valves to be fitted. Cylinders well lagged with asbestos and covered with planished steel plates and brass bands.

Cylinders to test by hydraulic pressure to twice their working pressure.

Indicator cocks and all necessary gear to be fitted for taking diagrams.

Cylinders to be secured together and to columns with turned and fitted bolts, all joints fitted metal to metal and edges of flanges chipped flush.

Cylinder Covers.

Of cast iron well lagged, flanges machined and lagging spaces enclosed by coned polished cast iron covers.

STOP VALVES.

To have stop valve on boiler shell and stop and throttle on H.P. casing, of gunmetal, and controlled from engine platform.

PISTONS.

Of cast iron, fitted with jack rings.

Packing rings Lockwood and Carlisle's throughout.

PISTON RODS.

Of forged steel of ample strength and proportions, slipper guides lined with white metal and to have equal surfaces ahead and astern.

Rods to be interchangeable. Top end brasses of gunmetal of approved area, kept in place by through bolts with double nut and split pins and polished steel keeps.

United States Metallic packings to fit in piston rods and valve spindles.

CONNECTING RODS.

Of forged steel with fork ends at top fitted with gudgeons on L.P. engine extended at each side to take brasses for pump levers.

Bottom and brasses of gunmetal lined with approved white metal to have large surfaces and to have through bolts with double nuts and split pins, or other approved means of locking nuts, and polished steel keeps.

Crosshead pins shrunk in and secured to approval.

Bottom end oil cups to fit with wide mesh wire strainers.

SLIDE VALVES.

Of hard cast iron planed and scraped true to cylinder faces. Valves to secure with double gunmetal nuts and to have springs at back, or other means of keeping them on their faces. H.P. to have piston valve. M.P. may be piston type at Builders option.

VALVE RODS.

Of forged steel with ends recessed for saddle blocks, saddle blocks of gunmetal held in place by keeps, bolts, and nuts, rods to flat valves carried through valve chest covers at top into dummy gunmetal guides. Good guides to fit to lower ends of rods.

VALVE GEAR.

Of double bar type of forged steel.

All moving parts adjustable and to have gunmetal bushes, including drag links, Gudgeon pins forged solid on link quadrants.

REVERSING GEAR.

Of Brown's steam and hand type fitted within easy reach of starting valve. All stop and pass valves, drain cocks, gauges, etc., brought close to reversing gear on starting platform.

ECCENTRIC RODS.

Of forged steel of ample strength with solid forged forked ends, having adjustable bearings.

ECCENTRIC STRAPS.

Of gunmetal lined with white metal. Top and bottom halves interchangeable. Studs in straps to be left long for liners. Straps to have oil boxes as necessary.

Eccentric sheaves cast separately.

BEDPLATES.

Of cast iron, strong section, with solid pedestals recessed for main bearings.

Gunmetal bearings, lined with approved white metal to be fitted. Keeps of polished steel held in position by through bolts with nuts, top and bottom, fitted with set pins.

Seating flanges to machine.

GUIDES.

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Of cast iron or wrought steel carefully machined with equal surfaces ahead and astern, and to have suitable oil channels cut. Brass combs and oil boxes to fit.

CRANKSHAFT.

Of forged steel, in one piece, diameter $\frac{1}{4}$ in. in excess of Lloyd's requirements and accurately turned and finished bright all over.

INTERMEDIATE SHAFTING.

Of forged steel, $\frac{1}{8}$ in. in excess of Lloyd's requirements, finished bright all over, couplings forged solid, and to have fitted parallel bolts.

PROPELLER SHAFT.

Of forged steel, $\frac{1}{4}$ in. in excess of Lloyd's requirements with continuous gunmetal liner fitted between fore end of propeller boss and fore end of stern tube.

Feather to fit whole length of cone.

Thread on tail shaft opposite hand to propeller.

Tail shaft coupling forged solid and kept well inside gland.

STERN TUBE.

Of strong construction of cast iron, with gunmetal bush, lined with lignum vitæ, capable of being removed easily. Stern tube kept in place by wrought iron nut. Drain cock to be fitted. Steam thawing connection to be fitted.

THRUST BLOCK.

Of cast iron with horse shoe type adjustable collars faced with white metal.

To run in oil bath. Block of strong section and well secured to foundation plate.

Seating flanges to machine.

TUNNEL BEARINGS.

Of cast iron with white metal bearings arranged on built steel seatings.

SURFACE CONDENSER.

Of galvanized wrought iron with cast iron doors galvanized, arranged in convenient position in engine room.

Tube plates of rolled brass not less than 1 in. thick. Tubes of solid drawn brass $\frac{3}{4}$ in. external diameter by 18 wire gauge thick, packed with cotton cord fitted with screwed ferrules, and capable of easy withdrawal or renewal.

Mud doors to fit in bottom convenient for cleaning. All bolts, stays and nuts inside condenser to be of Naval bronze. Condenser to have supplementary feed cock, drain cock, and soda cock. Condenser to test by water pressure to 30 lbs. per square inch in its finished condition.

PUMPS, LEVERS AND LINKS.

Pump levers of solid forged steel machined all over and worked off L.P. engine, connected by links to piston rod and crosshead gudgeon, and pumps crosshead by polished link rods, with adjustable bearings. Pillar blocks to have gunmetal bearings for rocking shaft.

Pump link gudgeons forged solid with levers.

Pump links of steel, with gunmetal adjustable bearings.

Pump crossheads of forged steel turned bright all over.

AIR PUMP.

Of Edward's type, of ample capacity for maintaining 25 in. vacuum in tropical waters. Barrel of gunmetal smoothly bored, and fitted with necessary valves and seatings. Pump seatings and bucket to be of gunmetal with metallic valves.

Rods of Muntz metal or approved bronze.

Air pump to have suitable hotwell on delivery, and overflow to feed tank.

FEED AND BILGE PUMPS.

Of gunmetal of approved diameter, driven by levers off crosshead. Feed pumps to draw from hotwell, feed tanks and sea, and pump into boiler with all necessary valve boxes and valves of gunmetal of approved diameter. Air vessels of large size to fit on discharge, and pet cocks to be fitted.

Bilge pumps to draw from bilge, hold and sea, and discharge overboard and on deck as may be required.

Lifts of suction and delivery valves to be adjustable.

Spring relief valves to fit on feed pump discharges.

CIRCULATING PUMP.

A centrifugal circulating pump to fit of ample capacity, driven by an independent engine of slow running type and to discharge through condenser. Pump casing of gunmetal, and impeller and spindle of bronze. Impeller to have outside bearings.

Engine of strong construction with large bearing surfaces of gummetal throughout.

All bolts and nuts exposed to action of water of gunmetal.

Suction and discharge pipes of solid drawn copper.

Water service connection from circulating pump. Bilge injection to fit in accessible position.

Auxiliary air pump of gunmetal to fit, driven off end of crank shaft. [240938]

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SEA CONNECTIONS.

Suctions and discharges of gunmetal throughout, including chests, with spigots passing through shell. Steam jet to fit for thawing main injection.

Zinc protectors to fit to under water fittings. Weed box to fit on main injection in such a manner that grids can be removed when choked and duplicate, which is to be supplied, inserted.

PIPES.

All pipes between main and auxiliary engines to and from boiler of solid drawn copper, tested to double their working pressure. All steam exhaust and feed pipes well lagged with asbestos rope covered with strong canvas and plates in way of traffic neatly finished off and painted. Bilge pipes of galvanised wrought iron with galvanised strainers securely clipped.

Valve boxes and valves of gunmetal, with name plates.

TURNING GEAR.

To consist of machine cut worm and worm wheel worked by ratchet.

GAUGES.

Boiler, H.P. intermediate, compound and vacuum gauges to fit in suitable manner near starting platform. A pressure gauge to fit in stokehold. All of approved make and 6 ins. diameter.

LUBRICATORS.

A complete set of lubricators to supply with oil boxes and oil cups to approval.

Large oil cups to fit to moving parts for easy lubrication when running.

Galvanized troughs to fit under each pair of eccentrics.

PROPELLER.

Of approved bronze, of suitable dimensions for intended speed and service. Neatly finished off and balanced. Zinc protectors to fit.

FEED DONKEY.

Of Weir's make, combined with automatic float feed gear, of sufficient capacity to supply boiler, with engines working at full power, for an extended period. Water end of pump entirely of gunmetal. Suctions arranged from condenser, sea, hotwell and reserve feed tank, and discharges direct to boiler and reserve feed tank. A connection to provide to general service valve box. All rods and valves to be Monel Metal.

GENERAL SERVICE DONKEY.

Of Hayward Tyler's or other approved make, duplex type, with gunmetal water end.

Suctions arranged from sea, reserve feed tanks, peaks, and bilge service, and discharges to sanitary tanks, condenser, overboard and to wash deck service. This pump to do duty as a fire pump in case of need.

WASH DECK SERVICE.

Wash deck pipe of copper to carry under bulwark rail. Two of the wash deck caps to have small taps fitted for washing Biological specimens.

EVAPORATOR.

To fit in Engine room, of Caird & Rayner's or equal approved make. To have galvanized steel shell, coils easily accessible and generally in accord with first class practice. Pumps and other connections to fit to suit installation and suitable for use in Port or at sea. Evaporator to connect to condenser and feed water tanks.

FEED HEATER.

Of surface type, using exhausts from auxiliaries. To drain to hotwell. Byepass valves to fit, admitting through heater or direct to boilers. Tube plates of rolled bronze and all parts easily accessible.

BILGE EJECTOR.

Of approved pattern, of gunmetal, fitted in engine room with separate bilge connection, also connection to general service valve box. Suction pipes to be 2 ins. diameter.

AUXILIARY STEAM AND EXHAUSTS.

All auxiliaries to have steam and exhaust valves and to work at full boiler pressure. All auxiliaries to exhaust to atmosphere and condenser, excepting circulating engine which is to exhaust to condenser only. Drains to be specially carefully arranged, having regard to Antarctic service.

Branch castings of gunmetal to fit where pipes pass through structure.

OIL TANKS.

For engine oil, lamp oil and cylinder oil, arranged in convenient position in Engine room with filling plugs and lock cocks as necessary. All to be rectangular, with capacity for 4,000 miles run.

Brass service tank to supply with one two-gallon and two one-gallon compartments and saveall.

VOICE TUBES.

Between Navigating and Pilot Bridges, aft steering wheel and engine platform, of copper with 4 in. covered mouthpieces and gunmetal whistles.

TELEGRAPH.

Reply telegraph, on Navigating Bridge, on brass pedestal communicating with engine room. Of Chadburn's or equal approved make. All handles to be wood covered.

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FLOOR PLATES.

In engine room and stokehold of chequered plate, those along boiler fronts of cast iron, all fitted well together and into wings to prevent ashes getting into bilges. Traps to be fitted for access to bilge suctions. Guard plates to fit at Boiler front. Supports and framings for plates to be specially carefully arranged.

PLATFORM GRATINGS.

Of triangular or tee section with handrails, ladders and fittings complete.

Splashers and Handrails.

Splasher plates of planished steel, with brass beading at edges in way of cranks.

Hand and guard rails and stanchions to fit to approval.

BOILER.

One horizontal multitubular return tube type boiler of steel, constructed to Board of Trade requirements for a working pressure of 180 lbs. per square inch, fitted with large flanged manholes and mudholes.

Tubes of lap welded iron $2\frac{1}{2}$ in. diameter swelled $\frac{1}{8}$ in. at one end and fitted with retarders. Longitudinal stays and all internal parts arranged easily accessible for cleaning.

Heating and grate surfaces very large so as to maintain a full head of steam under ordinary working conditions.

Lifting lugs to fit as necessary.

Zinc plates with necessary studs and hangers.

Boiler to be lagged with asbestos $\frac{3}{4}$ in. thick and in addition approved non-conducting composition $1\frac{1}{2}$ in. thick, covered with galvanized steel plates, secured with bands of same material. Uptake to be efficiently baffled. Boiler to test to Board of Trade requirements.

FURNACES.

Three in number of Deighton's make and type flanged up to suit tube plates.

BOILER MOUNTINGS.

To have lock up type double spring safety valves, fitted with drain and solid drawn copper waste steam pipe, main and auxiliary steam valves, two sets Admiralty type asbestos packed water gauges with glass guards, test cocks, steam pressure gauges, scum and blow off cocks with internal pipes and connections, and deep toned whistle and syren both worked from steering positions.

All cocks and valves of Dewrance's make of gunmetal throughout and of strong design.

Two double shut off feed check valves to fit, also internal feed pipes.

Main steam pipes to be carried well up, so that water cannot accumulate. Slotted internal steam pipe to fit as high as possible.

CASINGS.

All necessary casings, doors, etc., to fit to boiler to connect with funnel and plates of ample thickness. Chains and pulleys for lifting doors, with ring bolts, etc., to supply and fit.

FUNNEL.

Double with outer galvanized casing. Height and diameter as necessary for good draught.

Funnel cravat and top cover to be supplied.

Stays of wire ropes to casing tops with stretching screws.

LIQUID FUEL INSTALLATION.

Of Wallsend Howden or equal approved make combined with an approved arrangement of burners and furnace fittings.

Two horizontal simplex pumps and two oil fuel heaters to supply, each pump and heater of ample size for dealing with the whole of the fuel required.

Pumps and heaters to fit on oiltight trays in stokehold, Each unit to form a working or standby unit, so that either is available for working in the event of the working unit requiring overhauling.

Overboard discharge to fit, with non-return valve. Heaters to cover with non-conducting composition and planished steel sheets.

A hand driven pump of ample size to fit for raising steam, to draw direct from bunkers and discharge into delivery pipe for burners, also to suction side of pumps. Oil fuel pumps to draw from oil bunkers through duplex strainers.

All hot pipes to be carefully lagged and pipes liable to damage to protect with iron covers. All joints metal to metal and carefully scraped.

Bolts attaching flanges of valves, cocks, etc., to be screwed through bunkers and plates from inside, and to have washers and grommets under heads and nuts. Joints to be as few as practicable.

All nuts outside so that they can be easily tightened up.

Flanges and bolting to be in accordance with Admiralty practice.

Distributing valve boxes to fit, with independent adjustment to each burner.

Thermometers to fit to heaters, also on burner supply near burners. Pressure gauges to fit as required.

One burner to fit to each furnace.

Drip trays to fit, in fronts of furnaces, of galvanized iron.

Brickwork to specially arrange to suit requirements of installation.

All Board of Trade requirements to be provided.

Liquid fuel gear to be tried at moorings and engines turned under steam before vessel is taken for speed trials. Steam to be raised in first instance from cold with hand pump and installation fittings only.

Steam fire extinguishing system to fit below stokehold platform with controls from deck and below.

Half ton sand box to fit in stokehold.

FAN AND ENGINE.

Forced draught fan of Howden's make. Fan driven by an enclosed slow running engine, with forced lubrication and ample bearing surfaces. Piston rods long enough to prevent oil being carried from oil chamber to steam cylinder.

Air pressure gauges to fit in engine room, also fan controls.

FORCED DRAUGHT FITTINGS.

All necessary furnace fronts and fittings for Howden's forced draught system to be supplied including fire doors, ash pit doors, air valves and regulators, heating tubes, air pressure gauges, etc. Fronts also suitable for coal fuel and quickly interchangeable with stowing positions for fronts not in use.

Fan delivery trunks to have dampers fitted.

Pipes on boiler fronts arranged readily removable.

SCREEN BULKHEAD.

To fit round boiler dividing boiler and machinery space. Doors to fit for access to stokehold.

CLOCK.

An eight-day English lever clock in brass case to fit on polished board in engine room.

LOCKERS.

Arranged each side of engine room in line with ends of side bunkers and fitted out for engine room gear tools and equipment.

TESTS.

All tests required by the Naval Architects and Inspecting Engineers to be carried out to their satisfaction and at Contractor's expense.

TRIALS.

On completion the vessel to be tried as directed by the Naval Architects and Inspecting Engineers on an Approved Admiralty measured distance under Admiralty conditions, when loaded as set forth in Hull Specification, and the speed to be not less than 12 knots per hour.

After above trails a continuous run to be made of six hours on a course approved by the Naval Architects and Inspecting Engineers, during which time the speed, revolutions and pressures to be maintained as on the measured distance, and consumption carefully measured by the Contractors. Indicator Cards to be taken on each run on measured distance and afterwards as directed and handed to the Naval Architects and Inspecting Engineers.

Steering and manoeuvring powers of the vessel ahead and astern to be tried and all auxiliary machinery throughout the vessel to be carefully tested to satisfaction of the Naval Architects and Inspecting Engineers.

The trials of the vessel to be extended over two days, one day burning coal fuel and one day burning liquid fuel, and the sequence of trials will be determined near completion of the vessel.

Full costs of all materials and labour for trials to be borne by Contractors.

NOTE.—Any modifications of the Machinery specification necessary to enable any intending Contractor to conform to a standard and approved type of Machinery may be stated when Tendering, and will, subject to the specified guarantees and Special and General Conditions of Contract, be considered.

ENGINE AND BOILER ROOM OUTFIT.

I set of mandrils for all bearings fitted with white metal.

All necessary spanners, etc. (fitted in rack in engine room).

1 each 6", 8" and 12" shifting spanners (Clyburn's).

2 ratchet braces, 12 drills, and drilling post.

1 set Whitworth stocks, dies and taps $(\frac{1}{4}"$ to 1") fitted in lock up box, with three taps to each size.

Tools for tubing condenser.

Complete set of tools, two tube expanders, etc., for retubing boiler.

All eyebolts, piston extractors, starting screws, as may be necessary for thoroughly overhauling engines and boiler.

1 grindstone and trough.

- 2 indicators of Crosby or Dobbie McInnes make with scales and springs complete.
- 2 hanks of indicator cord.

1 tallow box.

4 oil cans (half gallon and one gallon).

2 oil funnels with gauze.

6 oil feeders.

4 brass oil syringes, 2 with bent nozzles.

4 mats for engine room.

4 galvanized iron buckets.

8 galvanized iron ash buckets.

4 brass hand lamps for engine and boiler room.

1 set fire bricks as fitted.

4 hand hanuners.

1 quarter hammer.

2 each lead and copper hammers.

2 coal hammers.

12 chisels assorted.

12 files, assorted.

28 lb. bolts and nuts, assorted.

1 pinch bar.

Complete set of tools for scaling and cleaning boiler.

1 6" parallel vice (instantaneous grip) to be fitted with bench.

1 metallic salinometer and pot.

4 each assorted packing screws and sticks.

 $1 \frac{1}{2}$ -ton Weston chain block.

1 pair rope blocks for bottom ends, etc.

30 lbs. insertion and other jointing as may be fitted.

Tuck's packing, lamp wick, spun yarn, asbestos cord, to approval.

Split pins, steel wedges, caulking tools, brass, copper, and lead wire as required.

2 sets zinc protectors for underwater valves, also for rudder and post.

18 tube brushes.

2 tube brush rods.

2 tube scrapers.

1 turkey oil stone in box.

- 10 square feet wire gauze.
- 10 square feet thin brass.

4 sheets tin.

30 square feet rubber insertion.

15 square feet asbestos insertion.

1 cwt. white metal as used in main engine bearings.

1 ladle and melting pot for white metal.

1 adjustable hack saw and 12 blades.

1 complete set for working and one set of spare metallic filament lamps and one set carbon filament lamps.

48 carbons for searchlight.

1 linesman's tool box for electric installation, complete and fitted with ample outfit of tools and materials for the work. Contents to state in Tender.

I galvanometer and battery.

1 blacksmith's fire.

1 anvil, 1 cwt.

1 drilling machine, hand power, for drilling up to $\frac{1}{2}$ holes.

2 sets twist drills 1" to 1" diameter (22 in all).

2 pairs blacksmith's tongs.

1 set laths for valve settings.

I gauge for main bearings.

2 thermometers fitted in engine room.

2 thermometers fitted in stokehold.

2 sets of firing tools.

I coal measure.

1 Salter's spring balance to 300 lbs.

PARTICULARS OF MAIN AND AUXILIARY MACHINERY.

Proposed	sizes of main engines			
	revolutions of main engines			
	I.H.P. of main engines (collective)		
	Makers of main engines			
	consumption of water per 24 hou	rs		
	" ., coal fuel per 24 l	hours		
	" " oil fuel …			
	makers of main boiler			
11	sizes of main boiler			
0	heating surface of main boiler			
	grate surface of main boiler		•···	
	sizes of Weir's feed pumps			
**	makers general service donkey	•••		
,,	sizes general service donkey			
	Contractors' electrical installation			
.,	makers electric light engine			
	sizes electric light engine		•••	
	makers electric generating set			
,,	output electric generating set	•••		
	makers forced draught engine			
"	sizes forced draught engine			
83	sizes forced draught fan			
,,	makers steering gear			
**	sizes steering gear			
	makers steam windlass			
	sizes steam windlass			 e.
	makers steam winch			
	sizes steam winch			
"	makers circulating pump			
**	size circulating pump	••		
	makers oil fuel installation			
.,	" oil fuel pumps			
,,	" feed heater			
	"evaporator			
	·· 1			

General arrangement and midship section indicating proposed arrangements are to be submitted with Tenders.

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WEIGHTS.

Estimated weight of hull with forgings, stanchions and		
deck machinery complete	5	
Estimated weight of equipment, deck fittings and deck machinery		
Estimated weight of main engines, propellers, shafting and engine-room auxiliaries		
Estimated weight of boiler, lagging, funnel and mount-		
ings complete		
Estimated weight of water in boiler, condenser and		
pipes		
Estimated weight of stores, outfit, etc		
Estimated weight of spare gear		
Estimated displacement at mean loaded draft of		
ft. ins		

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THE SCHEDULE OF SPARE GEAR REFERRED TO IN THE CONTRACT.

The Contractors will quote separately in their Tenders for the principal parts of main engines, boiler and auxiliary machinery as named below, liable to require renewal from wear, tear or accident, with the approximate price of each part separately stated and being the amount at which the Contractors will be prepared, subject to fluctuations in rates of wages and/or cost of materials to supply each part to the order of the Crown Agents.

					£	8.	d.
MAIN ENGINE	s.						
2 connecting rod top end bolts and nut	ts						
2 connecting rod bottom end bolts and	nuts						
2 main bearing bolts and nuts							
1 set of coupling bolts							
1 set of feed and bilge pump valves							
1 set of H.P. piston rings, Lockwood &	c Carlis	sle's					
1 set of M.P. piston rings, Lockwood &	e Carlis	sle's					
1 set of L.P. piston rings, Lockwood &	carlis	le's					
14 lbs. brass bolts and nuts, assorted, doors, pumps, etc., to approval	suitabl	e for	conde	nser 			
28 lbs. steel polished bolts and nuts for m	nain eng	gines					
Iron of various sizes, 1 cwt.							ł
Crank shaft							
Thrust shaft, interchangeable end for en	nd						
2 propeller shafts and nuts complete							
2 propellers (approved bronze)							
I stern bush as fitted with two sets lig	num v	itæ					
1 pair connecting rod brasses							
1 pair crosshead brasses			•••				
1 set double bar link brasses				•••			
l eccentric strap complete (top and	botton	halv	ves in	nter-			
changeable)			•••				
1 air pump rod and nut complete	····	 bloolro		••• []			
1 valve spindle with gunmetal nuts and to	moler	DIOCKS					
12 junk ring studs as litted							
12 cylinder cover studs as fitted							
12 valve chest cover studs as fitted							
100 condenser tubes							
200 condenser tube ferrules							
1 U.D. with an exit has a spring							
I M.P. miston, without rings							
I M.F. piston, without rings						2	
I Dir. piston, without rings							
Foresti and and hereit							
I double her link and brasses	one end	rine					
H P pieten and and sing	one enf	5.000					- 13
1 M.D. volve and rings							
I I. P. slide schere							
[240938]						Ę	5A

						£	s.	
MAIN E	NGINES-CO	ntinued						
1 main bearing, top and b	ottom halv	es						
1 feed pump ram and nuts	3							
1 bilge pump ram and nut	s							
1 set of air pump valves .								
1 set of feed pump valves							}	
1 set of bilge pump valves								
l air pump rod gland								
1 feed pump rod gland								
1 hilge nump rod gland								
1 thrust coller								
1 intermediate shaft		•••						
1 mein sten volue (volue)							1	
1 main stop valve (valve c	////y)	····						
1 intermediate stop valve	valve only) 		•••				
I set metallic packing for	H.P. rod a	na spi	nale		••••			
l set pump link brasses, b	ack (two h	alves)		•••	••••			
1 set pump link brasses, fi	ront (two l	aives)	•••	•••	•••			
2 sets metallic packing cor	nplete for	piston	rods	• • •	•••			
2 sets metallic packing con	nplete for	valve 1	rods		•••			
FEED	DONKEY (WEIR'S	3).					
1 rod and bucket complete	···							
2 complete sets water valv	ves and spr	ings						
2 sets of piston and pump	rings						1	
1 set of glands complete								
1 steam chest complete wi	th shuttle	valve						
ELE	CTRIC LIGH	T ENG	INE.					
1 complete set of brasses .								
1 complete set of glands .								
1 set Governor springs .				•••				
1 piston rod complete .								
1 valve and spindle comple	ete							
1 eccentric stran and rod				••••				
1 niston and since complete	o							
1 provin and rings complet	· ···			•••				
i crank shart complete .	•••••							
	D							
1	DYNAMO.			1: 1				
armature, complete with c	ommutator	, pack	ed in ti	n-iined	case			
I set of brush holders .	•• •••	•••						
3 sets brushes								
2 bearing bushes								

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SPARE GEAR—continued.

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ELECTRIC FANS. 6 armatures complete 6 sets brush holders 18 sets brushes 12 bearing bushes 12 bearing bushes WIRELESS INSTALLATION. 1 armature for motor 2 sets of brushes 1 armature for motor 2 sets of brushes 1 tems recommended by Makers MAIN BOILER. Half set tubes plain and stay 12 zine plates 12 gauge glasses 12 gauge glasses 1 set of fire-bars, bearers and furnace fittings complete 1 set of fire-bars, bearers and furnace fittings complete 2 sets firebricks 1 set fring tools 2 sets firing tools 1 set caukling tools 2 tube brushes 2 tube strahees 2 tube strahees 2 tube strahees 2 tube strahees 3 set firing tools 3 set firing tools 4 tube expanders 5 tube strahees 6 complete set of brasses 7 tube brushes 1 complete set of brasses 1 complete set of glands 1 set main be								£	s.	d.
6 armatures complete		FIRCTRIC	FANG							
6 sets brush holders	6 armatures complete	DLECINC	PANS.							
18 sets brushes	6 sets brush holders									
12 bearing bushes WIRELESS INSTALLATION. 1 armature for motor	18 sets brushes									
WIRELESS INSTALLATION. 1 armature for motor 2 sets of brushes Items recommended by Makers MAIN BOILER. Half set tubes plain and stay 6 tube stoppers 12 zine plates 13 set of fire-bars, bearers and furnace fittings complete 14 set firing tools 15 sets firebricks 2 tube brush rods 12 tube brushes 12 tube brushes 12 tube brushes 12 tube states 13 set firing tools 14 set to brases 15 tube state 15 set callking tools 15 set callking tools 15 set state of brases 15 set state of brases 16 complete set of brases 17	12 bearing bushes									
URLESS INSTALLATION. 1 armature for motor 2 sets of brushes 2 sets of brushes Thems recommended by Makers MAIN BOILER. Half set tubes plain and stay 6 tube stoppers 12 zinc plates 12 gauge glasses 13 set of fire-bars, bearers and furnace fittings complete 14 set of fire-bars, bearers and furnace fittings complete 15 sets mudhole and manhole door joints 1 set of fire-bars, bearers and furnace fittings complete 1 set fring tools 1 set fring tools 1 set fring tools 1 set fring tools 2 tube brushes 2 main check valves (valves only) 2 auxiliary check valves (valves only) 2 tube scrapers 2 tube scrapers 2 tube scrapers 1 complete set of brasses 1 complete set of glands 1 set main bearings, crank pin and crosshead bolts and nuts 1 set main bearings, crank pin and crosshead bolts and nuts	source in									
WIRELESS INSTALLATION. 1 armature for motor 2 sets of brushes										
1 armature for motor	Wı	RELESS IN	STALL.	ATION.						
2 sets of brushes	1 armature for motor									1
Items recommended by Makers	2 sets of brushes									
Main Boiler. Half set tubes plain and stay	Items recommended by	7 Makers								
MAIN BOILER. Half set tubes plain and stay										
MAIN BOILER. Half set tubes plain and stay										
Half set tubes plain and stay		MAIN BO	DILER.				1			
6 tube stoppers	Half set tubes plain as	nd stay				+	··· ·			
12 zinc plates 12 gauge glasses 1 set of fire-bars, bearers and furnace fittings complete 1 set of fire-bars, bearers and furnace fittings complete 2 sets firebricks 2 sets firebricks 2 tube brush rods 1 set firing tools 1 set caulking tools 1 set caulking tools 2 tube brushes 2 main check valves (valves only) 2 auxiliary check valves (valves only) 2 tube expanders 2 tube scrapers	6 tube stoppers									
12 gauge glasses 1 set of fire-bars, bearers and furnace fittings complete 6 sets mudhole and manhole door joints 2 sets firebricks 2 tube brush rods 1 set firing tools 1 set caulking tools 1 set caulking tools 2 main check valves (valves only) 2 auxiliary check valves (valves only) 2 tube brushes 2 tube acpanders 2 tube scrapers 1 complete set of brasses 1 complete set of glands .	12 zinc plates									
1 set of fire-bars, bearers and furnace fittings complete 6 sets mudhole and manhole door joints 2 sets firebricks 2 tube brush rods 1 set firing tools 1 set firing tools 2 main check valves (valves only) 2 tube brushes 2 auxiliary check valves (valves only) 2 tube expanders 2 tube scrapers 1 complete set of brasses 1 complete set of glands 2 sets piston rings 1 set main bearings, crank pin and crosshead bolts and nuts 1 valve and spindle complete	12 gauge glasses									
6 sets mudhole and manhole door joints 2 sets firebricks 2 tube brush rods 1 set firing tools 1 set caulking tools 1 set caulking tools 2 tube brushes 2 main check valves (valves only) 2 main check valves (valves only) 2 auxiliary check valves (valves only) 2 auxiliary check valves (valves only) 2 tube expanders 2 tube scrapers 1 complete set of brasses 1 complete set of glands 2 sets piston rings 1 set main bearings, crank pin and crosshead bolts and nuts 1 valve and spindle complete	1 set of fire-bars, bearen	rs and furn	ace fit	tings c	omplet	e				
2 sets firebricks 2 tube brush rods 1 set firing tools 1 set firing tools 1 set caulking tools 2 main check valves (valves only) 2 main check valves (valves only) 2 auxiliary check valves (valves only) 2 auxiliary check valves (valves only) 2 auxiliary check valves (valves only) 2 tube expanders 2 tube scrapers 1 complete set of glands 1 complete set of glands <t< td=""><td>6 sets mudhole and m</td><td>anhole do</td><td>or join</td><td>its</td><td></td><td></td><td> </td><td></td><td></td><td></td></t<>	6 sets mudhole and m	anhole do	or join	its						
2 tube brush rods <td>2 sets firebricks</td> <td>•••</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	2 sets firebricks	•••								
1 set firing tools </td <td>2 tube brush rods</td> <td></td> <td></td> <td>•••</td> <td></td> <td></td> <td> []</td> <td></td> <td></td> <td></td>	2 tube brush rods			•••			[]			
1 set caulking tools 12 tube brushes 2 main check valves (valves only) 2 main check valves (valves only) 2 auxiliary check valves (valves only) and spring 1 safety valve (valve only) and spring 2 tube expanders 2 tube scrapers 2 tube scrapers 2 tube scrapers 1 complete set of brasses 1 complete set of glands 2 sets piston rings 1 set main bearings, crank pin and crosshead bolts and nuts	1 set firing tools	•••				•••				
12 tube brushes 2 main check valves (valves only) 2 auxiliary check valves (valves only) 1 safety valve (valve only) and spring 2 tube expanders 2 tube scrapers 1 complete set of brasses 1 crank shaft 2 sets piston rings 1 set main bearings, crank pin and crosshead bolts and nuts 1 valve and spindle com	l set caulking tools					•••				
2 main check valves (valves only) 2 auxiliary check valves (valves only) 1 safety valve (valve only) and spring 2 tube expanders 2 tube scrapers 1 complete set of brasses 1 complete set of glands 2 sets piston rings 1 set main bearings, crank pin and crosshead bolts and nuts	12 tube brushes				•••	•••				
2 auxiliary check valves (valves only) 1 safety valve (valve only) and spring 2 tube expanders 2 tube scrapers 2 tube scrapers FORCED DRAUGHT FAN ENGINES. 1 complete set of brasses 1 complete set of glands 1 crank shaft 2 sets piston rings 1 set main bearings, crank pin and crosshead bolts and nuts 1 eccentric strap and rod 1 valve and spindle complete	2 main check valves (valves onl	y)			•••				
I safety valve (valve only) and spring 2 tube expanders 2 tube scrapers FORCED DRAUGHT FAN ENGINES. I complete set of brasses 1 complete set of glands 1 crank shaft 2 sets piston rings 1 set main bearings, crank pin and crosshead bolts and nuts 1 eccentric strap and rod 1 valve and spindle complete	2 auxiliary check valv	es (valves	only)	•••			•••			
2 tube expanders 2 tube scrapers FORCED DRAUGHT FAN ENGINES. 1 complete set of brasses 1 complete set of glands 1 crank shaft 2 sets piston rings 1 set main bearings, crank pin and crosshead bolts and nuts 1 eccentric strap and rod 1 valve and spindle complete	I safety valve (valve	only) and	spring	5		•••				
2 tube scrapers FORCED DRAUGHT FAN ENGINES. 1 complete set of brasses 1 complete set of glands 1 crank shaft 2 sets piston rings 1 set main bearings, crank pin and crosshead bolts and nuts 1 eccentric strap and rod 1 valve and spindle complete	2 tube expanders			•••						
FORCED DRAUGHT FAN ENGINES. 1 complete set of brasses 1 complete set of glands 1 crank shaft 2 sets piston rings 1 set main bearings, crank pin and crosshead bolts and nuts 1 eccentric strap and rod 1 valve and spindle complete	2 tube scrapers			•••		•••				
FORCED DRAUGHT FAN ENGINES. 1 complete set of brasses 1 complete set of glands 1 crank shaft 2 sets piston rings 1 set main bearings, crank pin and crosshead bolts and nuts 1 eccentric strap and rod 1 valve and spindle complete										
I complete set of brasses 1 complete set of glands 1 crank shaft 2 sets piston rings 1 set main bearings, crank pin and crosshead bolts and nuts 1 eccentric strap and rod 1 valve and spindle complete	T	D		Ever	100					
1 complete set of brasses 1 complete set of glands 1 crank shaft 2 sets piston rings 1 set main bearings, crank pin and crosshead bolts and nuts 1 eccentric strap and rod 1 valve and spindle complete	FORCED	DRAUGHY	L LAN	ENGL	NES.		1			
1 complete set of glands 1 crank shaft 2 sets piston rings 1 set main bearings, crank pin and crosshead bolts and nuts 1 eccentric strap and rod 1 valve and spindle complete	I complete set of bras	3Ses								
1 crank shalt 2 sets piston rings 1 set main bearings, crank pin and crosshead bolts and nuts 1 eccentric strap and rod 1 valve and spindle complete	I complete set of glar	1ds								
2 sets piston rings 1 set main bearings, crank pin and crosshead bolts and nuts 1 eccentric strap and rod 1 valve and spindle complete	I crank shaft									
1 set main bearings, crank pin and crossnead boils and field in 1 eccentric strap and rod 1 valve and spindle complete	2 sets piston rings		 		holts o	and nut	s			
1 valve and spindle complete	I set main bearings, ci	rank pin a	na cro	ssneau	DOID	ind hav				
I valve and spindle complete	1 eccentric strap and	roa								
	I valve and spindle c	ompiete								
									1	
GENERAL GEAR		Sammun	GEA	D						
I complete set of brasses and glands for all parts	1 complete set of here	on and ale	nds fo	r all n	arts					
1 vieton rod complete	1 vinton rod complete	ses and gia		P						
1 more wheel	1 piston roa complete									
1 set of pistons and rings for each cylinder	1 worm wheel	ings for en	ch cyli	inder						_
1 set of pistons and rings for cach of mass	1 set of pistons and r	inga tor ca	on oyn							
1 ort of whool obving amidships and aft	1 crank shart complet	amidahing		aft				0.5		
	I SET OF WHEEL CHAINS	annusinpe	,						l	1

				£	s.
CARCTER					
I complete set of bearings for all parts					
1 complete set of glands					
1 set of pistons and rings for each cylinde	r				
1 piston rod complete					
1 valve spindle complete					
GENERAL SERVICE DONKI	EY.				
1 rod and bucket complete					
2 complete sets water valves and springs					
2 complete sets piston and pump rings					
1 piston complete					
CIRCULATING ENGINE SPAN	RES.				
1 complete set of brasses of all kinds					
1 complete set of glands					
l crank shaft					
1 eccentric strap and rod					
2 sets of piston rings					
1 valve and spindle complete					
I set main bearing, crank pin and crosshead	l bolts a	and nuts	3		
1 impeller and spindle complete					
1 set impeller bearings complete					
LUCAS SOUNDING MACHIN	NE.				ł
1 complete set of brasses of all kinds					
1 complete set of glands					
1 crank shaft					
1 eccentric strap and rod					
2 sets of piston rings					
I valve and spindle complete					
1 set main bearing, crank pin and crosshead	bolts a	nd nuts	•••		
STEAM WINCH.					
1 complete set of brasses for all parts	•••	•••			
i complete set of glands for all parts					
I complete set of piston rings		•••			
I piston and rod complete					
1 valve and spindle complete	•••				
1 spur wheel (in two halves)					
l crank shaft		•••			
1 pinion wheel		•••	•••		
2 cots wood for brakes					

SPARE GEAR—continued.

						£	8.	d.
	FEED 3	Heate	R.					
1 set of tubes as fitted					 			
	EVAP	ORATO	٤.					
1 set of coils complete					 			
1 relief valve spring					 			
1 set studs and nuts fo	r door				 			
Ош	Fruer.	Doxe	EVS					
1 red and bucket comp	lete				 			
1 piston	ic co				 			
2 sets of water valves a	and sur	ings			 			
2 sets of piston and pu	mp rin	gs			 			
6 brass-cased thermome	ters				 			
OIL	FUEL 1	NSTAL	LATION					
1 filter complete					 			
2 sets filtering media					 			
4 burners					 			
24 burner nozzles					 			
	Heatin	a Con	LS.					
4 straight lengths of pip	be with	flanges	compl	ete	 			
4 bent lengths of pipe	with fla	inges	comple	te	 			

All spare parts to be secured with clips in approved manner, spares for each machine to be kept separate and properly labelled with the names of the various parts.

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CROWN AGENTS FOR THE COLONIES.

GENERAL CONDITIONS OF CONTRACT. No. 4. FOR THE CONSTRUCTION OF VESSELS.

Norember, 1922.

<text><text><text><text><text><text><text><text><text><text><text><text><text><text><text><text><text><text><text><text>

Contract not to be sublet.

Definitions

Contractor to indemnify the Crown Agents. Alterations, additions and deductions.

Payment for extra work.

Extension of time for additional work.

Discrepancies between Drawings and Specification.

Work to be delivered complete. Engineer to approve inethods.

Contractor to take all risks.

Inspection and testing.

Powers of Engineer.

Engineer's Certificates

conveyed in Freight arrangements

Invoice and shipping particulars.

GENERAL CONDITIONS OF CONTRACT No. 4-(continued).

Insurance

Contract time for delivery. Contractor to give notice of delay,

Deductions for delay.

Drawings, etc.

Insolvency of Contractor and provisions in case of default.

Discrepancies in Conditions. No personal liability on Crown Agents. Mambers of House of Commons.

Contract an English Marginal no:es.

Fair wages clauses.

Certificates to be final.

Arbitration.

Dangerous goods.

24. When payment is made by instalments the Contractor shall until delivery has been taken by the Crown Agents at his own expense keep the work or such parts thereof as shall from time to time be constructed insured in the name of the Crown Agents and to their satisfaction against all risks to which the same shall for the time being be subject in such first class Insurance Office or Offices as may be approved by the Crown Agents in an amount at least equal to the full value of the work in respect of which payment is claimed. No money shall be paid to the Contractor hereunder except upon production and delivery to the Grown Agents of the Poheies of Insurance which ought to be effected by the Contractor nucle receipts for the payment of the promumes thereunder and in case the Contractor shall neglect to effect or to keep up any such insurance the Crown Agents may effect and keep up such insurance and deduct the expenses thereof from any moneys payable to the Contractor hereunder. In case the work or any part thereof shall be destroyed, damaged or lost, the Crown Agents shall receive the moneys paid in respect of the insurance and at their option either (a) such money shall be applied in rebuilding or reinstating the work so damaged, destroyed or lost in accontance with this Contractor as nerr thereto as in the opinion of the Engineer the circumstances will admit or (b) this Contract shall be determined, in which case the Crown Agents shall pay to the Contractor such amount as the Engineer shall certify to be fair and reasonable in all the eirounstances. 25. The Contract time for delivery shall be the period or periods named in the Tender or agreed upon with the Crown Agents reckoned from the date on which the work is ordered by the Crown Agents. 26. Should the Contract time, he must give notice accordingly in writing to the Contract shall be deliver the work within the Contract time, he must give notice accordingly in writing to the Crown Agents explaining the cause of the delay.

delay.

20. Should the Contractor anticipate at any time during the excention of the Contract onto the work within the Contract time, he must give notice accordingly in writing to the Cown Agents explaining the cause of the delay.
27. Failure to deliver within the Contract rime will in addition to any other liabilities incurred by the Contractor under this Contract subject the contracts to a deduction from the Contract sum as and for liquidated duringes and not as a penalty of one per cent, per week on the value of any work which may be in arrear unless the Engineer shall be of opinion that such delay has arisen from causes which were unavoidable and could not be forescen or overcome by the Contractor, in which case the Engineer shall certify the extent, if any, to which the deduction should be remitted and they shall be remitted accordingly, but any deductions not so remitted shall remain in full force. Delays in the supply of materials to the Contractor will not be forescen or overcome by the manufacturers or vendors of such materials.
28. Any drawings, tracings or descriptions specified must nules otherwise specified be furnished by the Contractor will not be first consignment of the work to which they refer and no payment will be made by the Crown Agents until such drawings, tracings and descriptions have been furnished to the satisfaction of the Engineer.
29. All other contract at an end and the Contractor shall only be paid for such payment or compound with his creditors or from any other cause whatever become unable or fail to carry on the Contract with efficiency, the Contract. The Contract relations of the Contract at an end and the Contractor shall only be paid for such payment or compound with his creditors or low any other cause whatever become unable or fail to carry on the Contract with efficiency, the Crown Agents shall have actually been exceuted at the date of such declaration, after deduction of any such cause hould be under the conditions of the Contract. The Contr

or (b) May determine this Contract and thereupon the Crown Agents may take possession of or remove and dispose of for their own benefit the work in its then state and all material then being the property of the Crown Agents under this Contract (together with the benefit of any sub-contracts for any part of the work) without making any further payment to the Contractor than such (if any) as the Engineer shall certify ough to be paid to him having regard to his default and all the circumstances of the case, or

the circumstances of the case, or
(c) May without determining this Contract take possession of the work in its then state and all materials intended for it and complete the work (in the Contractor's yard) in accordance with this Contract and the costs incurred by the Crown Agents in the exercise of any of the powers contained in this sub-clause (as certified by the Engineer) shall be deducted from any moneys then payable or thereafter to be payable to the Contractor bercunder and if such moneys shall not be sufficient the deficiency shall be made good and paid by the Contractor to the Crown Agents.
30. Should there be any discrepancy between the General Conditions and any Special Conditions or Specifications of this Contract the Special Conditions or Specifications shall be followed in preference to the General Conditione.*
31. Nothing in these General Conditions or in any part of the Contract shall be deemed to impose any personal liability on the Crown Agents or on any of them or on any of their of their admitted to any share or part of this Contract, or to any benefit to arise thereform—see House of Commons (Disqualification) Acts, 1782 and 1801.
33. This Contract shall be deemed an English Contract and shall accordingly be governed by and construed according to English haw.

English lay 34. Marginal notes hereto are for the purposes of convenience only and shall not affect the construction or interpretation of this Contract.

34. Marginal notes hereto are for the purposes of convenience only and shall not affect the construction or interpretation of this Contract.
35. The Contractor shall pay rates of wages and observe hours of labour not less favourable than those commonly recognised by employers and trade societies (or in the absence of such recognised out, Where there are no such wages and hours recognised or prevailing in the district those recognised or prevailing in the nearest district in which the general industrial circumstances are similar shall be adopted. Further the conditions of employment generally accepted in the district in the trade concerned shall be taken into account in considering how far the terms of fair wages clauses are being observed. The Contractor shall be responsible for the observance of the fair wages clauses by the Sub-contractor (f any).
36. The Contractor shall cause the preceding condition to be prominently exhibited for the information of his workpeople on the premises where work is being executed under the Contractor. Printed copies of such notice will be supplied on application to the copy of any signed agreement determining the rates of wages and hours of labour commonly recognised by employers and trade societies in the district.
37. The Contractor shall keep proper wages hooks and time sheets showing the wages paid and the time worked by the workpeople in his employ in and about the execution of the Contract and such wages books and time sheets shall be final and conclusive for all purposes and shall be binding on the Crown Agents.
38. Any decision, certificate or determinion made or given by the Engineer in pursuance of this Contract shall be final and conclusive for all purposes and shall be binding on the Crown Agents and the Contractor.
39. Any question, dispute or difference between the Crown Agents and the Contractor arising out of this Contract shall be final and conclusive for all purposes and shall be binding on the Crown Agents

shipping particulars.

INSTRUCTIONS TO FIRMS TENDERING.

The original Form is to be filled up complete in every respect and delivered, properly sealed, by hand or by post, not later than noon on the date named on the face of the form in the special green envelope when such is provided for the purpose. If no date is specified, the form should be returned as soon as possible.

The duplicate form is intended to be retained by the firm.

Both forms should be returned to the Crown Agents at once if the firm is unwilling or unable to tender.

The Crown Agents do not bind themselves to accept the lowest or any tender and they reserve to themselves the right of accepting any tender wholly or in part.

Copies of any drawings referred to in the Specification can be seen at the Crown Agents' Offices and can be obtained from Mr. W. J. Harrison, 7, Carteret Street, Westminster, S.W., on a payment of a sum not exceeding 2s. 6d. per drawing.

> OFFICE OF THE CROWN AGENTS FOR THE COLONIES, 4, MILLBANK, LONDON, S.W.I.

The following are the matters which will more usually form the subject of special conditions:—
 Payment by instalments (cl. 22); provision of a sum to cover additional work (if any); amount of liquidated
 damages (cl. 27).

FALKLAND ISLANDS.

REQUISITION No. 1731/1.

TENDER.

TO THE CROWN AGENTS FOR THE COLONIES.

GENTLEMEN,

We are willing to construct and deliver free alongside our Works at __________the Steel Screw Whale Marking Vessel, with equipment and outfit for same, all in accordance with the terms and conditions of the annexed Contract General Conditions and Specification, for the sum of £______.

2. The above price for the vessel includes the sum of \pounds for fitting oil fuel bunkers and oil fuel burning installation complete.

3. The total cost for Spare Parts as set forth in the Schedule thereof on pages 35 to 39 would be \pounds ______. This amount is not included in the above price for the vessel.

4. The above named sums to cover all costs and charges in connection with the full and proper execution of the provisions of the Contract.

5. In the event of our Tender being accepted, we would undertake to complete the vessel ready to start on its voyage within _______weeks from date of order.

6. In the event of the order being placed in our hands, we propose to build the vessel at our ______ Works, and the machinery at ______ Works.

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7. The materials in the first column of the table following would be obtained from the Firms whose names we have set opposite to them in the second column, viz. :—

		* Nan	ie.	Situation of Works.
onal ma	terial			
			10	
	onal ma 	onal material	* Nar	* Name.

* If own make proposed it should be so stated.

8. In consideration of the trouble and expense incurred by you in examining and considering this Tender we further undertake that neither this Tender nor any portion thereof shall be retracted or withdrawn by us, before the expiration of one calendar month from the date thereof, but shall remain binding upon ourselves and may be accepted by you at any time within such period of one calendar month.

9. On the execution of the Contract mentioned above, this Tender is to be deemed absolutely superseded and annulled for all purposes.

DATED this

day of

192 .

For

_____ Limited.

Address_

Signature_

Waterlow & Sons Limited, London Wall, London.

