

C.C.G.S. LOUISBOURG

"Drydocking specification"

Fall 2012

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CCGS LOUISBOURG

DRY DOCKING SPECIFICATIONS

FALL 2012

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DRY DOCKING SPECIFICATIONS

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"DRAWING"

Are included with the specification, the following drawings:

General Arrangement	No ELA 7190-01
Docking plan	No 550-21
Stern Tubes and Shafting	No 122-5-m3
Propeller Shafts	No 315 15M/01
Shell expansion	No 02606007
Rudder and Steering Gear	No. H-19
Federal marking	No 02606-sf 1 of 2 and 2 of 2
Hull Superstructure construction detail	No 122-5-H3
Tank capacity plan	No.HD 49
Airmar M191 data sheet	

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ITEM H.D.-1

DRYDOCKING

REMARKS

1.1 Reference: Docking plan Drwg. No 550-21

1.2 **Ship's particulars:**

Length overall: 37.2 meters

Length between beam: 8.2 meters

Maximum draft: 3.35 meters

Load displacement: 261.98 tons

1.3 The shipyard is responsible for the mooring ship to a wharf close to the dry dock. That includes the installation and removal of a gangway, to be supplied by the shipyard. The shipyard is also in charge of moving the ship from the wharf to the dry dock. Same thing applies from the dry dock to the wharf upon completion of work.

1.4 The shipyard shall supply labor, materials and the required equipment to dock, tow and undock, including lay days throughout the dry docking period to perform the work described hereunder, in view of renewal of seaworthiness certificate.

1.5 Care must be taken to avoid any blocks being in way transducers plates of the echo sounders located between frames 7 and 9, as well as the sonar "Doppler" located between frames 7 and 8.

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ITEM H.D.-1

DRYDOCKING

REMARKS

- 1.6 Since shipyard will have the docking plan upon contract award, the shipyard will move any misplaced blocks at its own expense. The whole hull surface will be high pressure washed (5000psi minimum) as soon as possible after the ships docking.
- 1.7 The shipyard must supply material and labor required to number the frames and hull bulkheads, in order to ease its external inspection. The shipyard shall ensure that the frames remain numbered during the entire dry dock period.
- 1.8 A four (4) hour's sea trial shall be done following re floating of the ship upon completion of all specification items. The trials will be done at full speed during 4 hours at sea. Two (2) people (plus one supervisor) are required for sea trials. The yard must provide linesmen.

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ITEM H.D.-2	SERVICES	REMARKS
2.1	The following services shall be provided to the ship throughout the entire docking period, for which a firm price will be submitted. The price will cover all of the dry docking period and also the period when the ship will be at the wharf.	
2.2	Supply material and labor necessary to degrease, clean and dry drain all of the ship's bilges (including the engine room). Dispose of the oily waters as per actual environmental regulations. Allow a oily water quantity of 2 cubic meters to be pumped before cleaning. Drain the two (2) potable water tanks (capacity of 40 tons total) within two (2) hours after drydocking. The water drain plugs located between frames 25-28 port and starboard will have to be removed as soon as possible in order to drain these tanks completely. Remove keel drain plugs. (Possibility of hydrocarbons in the tank, install proper containers to catch any oily residue)	
2.3	Supply labor and service for the installation and the removal of a gangway, handling of lines and ropes and installation of a safety net under gangway, during the dry dock. The shipyard will supply the gangway.	

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ITEM H.D.-2	SERVICES	REMARKS
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2.4 Provide a telephone line to the ship's internal communication system. The telephone line will have to be disconnected at the end of the dry docking period. The telephone line will have to be maintained 24 hours per day, to assure communication at any time.

The invoice itemizing cost of long distance calls is to be forwarded to the of the Coast Guard Technical Services representative.

2.5 In order to avoid damage floors and alleyways, supply and install a 1/16" inch thick Masonite on the surface of the main interior decks, alleyways, Chief Engineer's cabin, chart room, wheelhouse and dining room. The surface area to be covered is 54 sq. meters. The protection shall be installed as soon as the ship enters dry dock. Protection is to be replaced if damaged.

2.6 Throughout the duration of work on shipyard premises, in and out of the dry dock, supply material and labor to connect and disconnect, one (1) ship's electric cable, to shore power supply is to be a 3-phase alternating current, 600 volts and 100 amp capacity. Assume a constant average electrical consumption of 40KW-h.

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ITEM H.D.-2	SERVICES	REMARKS
2.7	Supply all the material and labor to install required connections for fresh water supply for the following services during the entire period when the ship will be in dry dock. Disconnect upon completion of work.	
2.7.1	Supply the installation of a fire hose connected to the ship not under pressure but ready to be used in any time. Connections 1 ½ " located # 3 fire station on main deck.	
2.7.2	Provide fresh water for ship's requirements throughout the dry docking period (supply and install a water meter). Supply a potable water certificate to the CCG representative before hooking the water connexions.	
2.7.3	Supply material and labor to install a temporary pipe to allow the sanitary drainage of water (toilet) towards the sumps of the dry dock.	
2.8	Supply material and labor to temporarily connect drainage hoses to keep wastewater from ship's hull and drain these waters to dry dock drainage system during paintwork.	
2.9	Supply garbage containers placed on the fore deck for the ship wastes and empty them daily.	
2.10	The shipyard will allow the Canadian Coast Guard employees and other contractors to carry minor works.	

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ITEM H.D.-2	SERVICES	REMARKS
2.11	The shipyard shall take all necessary measures to make sure that all work described in this specification is completed by the end of the contract.	
2.12	Provide a docking plan where the blocks position during this particular dry dock is specified, so that the ship will be painted under the blocks at the next dry dock period. This docking plan is to be submitted to the CCG representative for approval upon completion of the current work in dry dock.	
2.13	The contractor will have to make sure upon completion of work that the ship is delivered to the CCG representative in a clean state and free from dust on all internal as well as external areas.	
2.14	Provide a temporary office to the CCG and PWGSC representatives. This office will be equipped with a telephone and high speed Internet line available 24 hours per day. The contractor will supply a 4-in-1 printer (printer-fax-scanner-copy) and supply paper (8-1/2"X11" and 8-1/2"X14") for the whole duration of works.	

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ITEM H.D.3	INSPECTION AND ADDITIONAL WORK	REMARKS
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- 3.1 Work will be completed and inspected to the entire satisfaction of the CCG representative and TCMS surveyor.
- 3.2 Upon completion of each specification item, the CCG representative will have to be notified one (1) hour in advance in order to inspect work before the end and closure of each item of the present specification.
- 3.3 Failure to notify the CCG representative does not absolve the shipyard of the responsibility of providing the opportunity to inspect any completed item.
- 3.4 The inspection of any item by the CCG representative can't substitute inspections required by the Transport Canada Marine Safety (TCMS).
- 3.5 The shipyard is also responsible for calling TCMS surveyors, in order to plan the inspection of the required items.
- 3.6 The shipyard will have to supply to the CCG representative two (2) complete booklets of all measurements and readings taken during work described hereafter, and all additional work arising from inspection of the hull and its components. The contractor will also supply to the CCG representative a soft copy of the measurement booklets in PDF format.

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ITEM H.D.4

STAGING AND CRANE

REMARKS

- 4.1 Supply necessary material and labor to erect staging for all work to be performed on the ship's hull including: All the submerged parts, the non submerged part, propellers, rudders, as well as the additional work. Remove staging upon completion of work.
- 4.2 Supply crane services and crane operator including a signalman and the required personnel for the work to be performed during dry-docking period. The crane will be used at a rate of one hour per working day 5 days week for ship's needs.

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ITEM H.D.5	RUDDERS	REMARKS
5.1	Remove linkages on each rudder stock in the compartment located at the aft section of the ship.	
5.2	Remove the transversal crossbar linking the two rudders. Unscrew the rudder locking nuts. Dismantle the port and starboard hydraulic cylinders pins.	
5.3	Remove jumping collars of each rudder. With a hydraulic jack, push out each of the rudders towards the exterior, making sure that support is available outside in order to avoid any damage to the rudders.	
5.4	Carry a complete inspection and measurement of the rudder stocks and bearings diameters. Check for straightness and ovalization. Note all readings in the measurement booklet.	
5.5	Once the inspection by the CCG representative and TCMS surveyor completed, reinstall the rudders following reversed procedure described above.	
5.6	Repack stuffing boxes with Shipyard supplied new packing. There are four (4) layers of $\frac{3}{4}$ " Teflon type packing for each rudder trunk.	
5.7	The contractor will prove the good performance of the steering in presence of the TCMS surveyor and CCG representative.	

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ITEM H.D.6	PROPELLER, SHAFTING AND SKF COUPLING	REMARKS
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6.1 Supply material and labor necessary to dismantle port and starboard propeller and shaft.

6.2 Remove port and starboard shaft/transmission coupling bolts and measure the parallelism of the couplings and this **while the ship is afloat**, before the dry docking. Support the propeller shaft close to the transmission couplings during alignment measurements. Clean couplings bolts and nuts that are numbered and adjusted.

6.3 When the ship is in dry dock, proceed with the disassembly of the propellers by using the ship supplied wrench to remove propellers from the tapered end of the tail shafts.

It will be required to take the wear down value of each shaft at the aft end of the stern tubes. The same measurements will be taken for A-bracket bearings (one measurement at each end).

The propellers blades will be replaced by new propellers as necessary after inspection by the CCG representative and TCMS surveyor.

6.4 On the tailshafts of 5 ¼ "inch in diameter remove the two (2) SKF OK type couplings, models TSP 6022 using a pump and special tools provided by the ship.

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ITEM H.D.6

PROPELLER, SHAFTING AND
SKF COUPLING

REMARKS

Caution:

Do not attempt to hammer or use a hydraulic jack to push the couplings.

6.5 Remove the two (2) shafts and to replace the four (4) bearings (Thordon SXL) of 20"L X 6 ¾" O.D X 5 ¼ "I.D. and two (2) of 21"L X 6 ¾ "O.D X 5 ¼" I.D. The bearings will be supplied by the shipyard. The port side A-bracket bearing is oversize of approx. ½" in O.D. (To be confirmed after disassembly). The replacement bearings will be supplied by the shipyard, via an authorized Thordon dealer (RMH industries Québec) once all housings diameters will be measured.

Supply and weld an aluminum ring of ¾ "of diameter int. threaded on each interior stern tube. Grind the old ring and to position the news where indicated.

6.6 Supply material and labour to fabricate two (2) new tail shafts, following the drawings #315-15M and #122-5-M35. Material will be Aquamet 17 or Aqualoy 17. Supply a Marine classification society certificate for each shaft.

The propellers will be adjusted on these shafts using Prussian Blue in order to obtain 80% or more area contact. Supply a firm price per fit, to a total of 24 fits (12 fits per shaft). The fits will be done in the presence of the CCG representative and TCMS surveyor.

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ITEM H.D.6

**PROPELLER, SHAFTING AND
SKF COUPLING**

REMARKS

6.6 (cont'd)

Supply a separate price to fabricate two (2) keys for the tails shafts (see tail shaft drawings). Material will be stainless steel 316.

Once fabricated, the tail shafts will be brought in a shop and assembled with the intermediate shafts and SKF couplings. Measure the run-out of the assembly at each end of each shaft and note the results in the measurement booklet.

Measure the diameters of the shafts and the run-out of each one, note the whole in the measurements booklet. Carry a NDT (magnaflux or dye check as per TCMS surveyor choice) on the keys and key way slots of the propellers and shafts and provide a report.

6.7 Verify the alignment of the propeller brackets (aft bracket) with the port and starboard stern tubes and transmissions of the ship with the laser or an equivalent method approved by the CCG representative and note the results in the measurements booklet.

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ITEM H.D.6	PROPELLER, SHAFTING AND SKF COUPLING	REMARKS
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- 6.8 Supply and replace both port side and starboard side stern tube stuffing boxes and glands. Replace all studs and bolts with 316 stainless steel (fwd of the stern tubes). Replace all gaskets. Reinstall the two new propeller shafts in the stern tubes.
- 6.9 Reinstall intermediate shafts and SKF couplings according to manufacturer's recommended procedure (see attached documents).
- 6.10 Reinstall propellers, nuts are to be locked in place then the propeller cones, propeller cone nuts are to be locked in place. (Supply a seal between the propeller and the cone). Fill up the Cones with Tallow or vegetable grease and to close the filler plug with a sealer product of the Sicoflex marine type.
- 6.11 On the interior, Repack the gland of each stern tube with 7 layers of 1"inch packing whom supplied by the shipyard, that will be compatible with Aquamet or Aqualoy shafts.
- 6.12 Proceed with the alignment of the shafting with the transmission in order to obtain parallel couplings with a maximum "off" value of 0.005", (shaft and transmission). The measurements will be taken in presence of the CCG representative. Provide detailed report of the alignment work and note all readings in the measurement booklet.

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ITEM H.D.7	GRIDS, SEA CHEST AND ZINC ANODES	REMARKS
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- 7.1 Supply material and labor to high pressure wash (5000psi minimum) the interior of the main sea chests.
- 7.2 Remove inspection doors at the beginning of works and reinstall upon completion of work after the sea chests will be painted. Both sides of the inspection doors are to be painted. High pressure wash, clean, prepare and paint the inner surfaces of the piping between sea chest and sea water manifold (to use the same paint system as the hull).
- 7.3 Reinstall with new stainless steel 316 bolts. Lock each bolt with stainless steel wire or to attach the bolts by pairs with a section of stainless steel plate. There are four (4) bolts per inspection door of 3/8" in diameter by 3/4" of inches long.
- 7.4 All zinc anodes of the ship are to be replaced. Anodes are to be supplied by the shipyard

There are twenty-four (24) Z3 zinc anodes fixed to the hull by an aluminum bar 16" long X 1 1/4" width welded to the hull.

12 on the port side and 12 at starboard side concentrated on each side of the shafting and the stern tubes.

(Refer to docking plan).

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ITEM H.D.8	VALVES AND SEA WATER MANIFOLD	REMARKS
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- 8.1 Supply material and labor necessary to overhaul all hull valves of the ship. The contractor will dismantle, clean the inner and outer surfaces using sand blast.
Once all parts dismantled and cleaned, have all parts inspected by the CCG representative and TCMS surveyor. Paint all inner surfaces with Intershield 300. Paint the outer surfaces with Intergard 264. Cut and grind the valves and the seats.
- 8.2 All valves must have reinstalled following inspection with new gaskets, seals and packing (supplied by the shipyard). All bolts will be replaced with Stainless steel 316. The material used for gasketing will be DURLON 8500
- 8.3 Supply and replace two (2) butterfly valves, 6", 150psi, used for propulsion engines sea water suction. Also replace valve #6 (see the table below). Supply a classification society certificate for each valve. All valves mentioned in item H.D.-8 will be pressure tested up to 150psi and witnessed by the CCG representative before their installation.
- 8.4 All damaged valves will have to be repaired or replaced.
To have access to the fore peak valve it will be necessary to dismantle the 2 floors of the fore peak and proceed to the cleaning and degreasing of this compartment with high pressure water jet (3000psi minimum). Dispose of the waste waters. Once the compartment dried and valve work completed, reinstall the floors.

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ITEM H.D.8

**VALVES AND SEA WATER
MANIFOLD**

REMARKS

8.5 Identification of valves.

Valve type

1	GATE VALVE
2	NOT RETURN VALVE
3	BUTTERFLY VALVE
4	SEA SUCTION VALVE

<u>ITEM</u>	<u>TYPE</u>	<u>DIAMETER</u>	<u>location</u>	<u>DESCRIPTION</u>	<u>QUANT</u>
#1	3	6"	E.R. center	Main sea chest suctions	2
#2	2	2 1/2"	Port E.R	Pumps discharge (bilge)	2
#3	2	4"	Port E.R	Port main engine discharge	1
#4	1	1 1/2"+ valve n/r	Port E.R.	Discharge from the toilets and sewage tank	1
#5	2	2"	Port E.R	Port generator discharge	1
#6	2	2"	Port E.R	Fresh water tank discharge	1
#7	1	1 1/4"+ valve n/r	fore peak port.	Fore peak manual pump discharge	1
#8	2	4"	Starboard E.R	Starboard main engine discharge	1
#9	2	3/4"	Starboard E.R.	Oily water separator discharge	1
#10	2	2"	Starboard E.R.	Starboard generator discharge	1
#11	1	3/4"	E.R. port & sorting.	Stern-tubes cooling discharge	2
#12	1	1 1/4"+ valve n/r	Lower deck	Grey water tank discharge	1
			Starboard fore room		

* n/r = non return

* E.R. = Engine room.

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ITEM H.D.8	VALVES AND SEA WATER MANIFOLD	REMARKS
8.6	Dismantle the sea water manifold located between two propulsion motors, carry it out of the vessel, then high pressure wash at 5000psi minimum. Clean all pipes between the two (2) propulsion motor and sea chests.	
8.7	After cleaning and drying, apply an epoxy paint (Intergard FP), then apply an anti-fouling paint (Interlux Trilux II 5.5 mils wet film).	
8.8	Reinstall the sea water manifold with new DURLON 8500 gaskets and new stainless steel 316 bolts.	

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ITEM H.D.9	FUEL AND SLUDGE TANKS	REMARKS
9.1	The shipyard will have to be able to transfer fuel from the tanks #1 and #2 of an average capacity of fifty (50) cubic meters into clean tanks near dry dock. Upon completion of cleaning and hot work, fuel will be returned to each of the tanks through a 10 microns filtration system, supplied by the shipyard. Include the replacement of ten (10) filter cartridges.	
9.2	Remove drain plugs and drain the remains of fuel, water and mud that are to be transferred into containers and carried out of the drydock by the shipyard. Allow a quantity of two (2) cubic meters of remaining liquids. These tanks are to be cleaned of all deposits before the CCG representative and TCMS surveyor inspection. Carry a hydrostatic test on all tanks.	
9.3	Diesel fuel day tank oil and sludge tanks will be drained, high pressure water cleaned and ventilated to allow safe inspection. Once the manhole covers will be removed, a breathable air certificate will be produced by a chemist who will enter the tanks and certify that tanks are gas free. A copy of each certificate is to be posted at each tank entrance and another copy will be given to the CCG representative for each tank.	
9.4	The fuel oil day tank will be cleaned after 1# and #2 fuel oil tanks will have been inspected and accepted by the CCG representative and TCMS surveyor.	

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ITEM H.D.9

FUEL AND SLUDGE TANKS

REMARKS

<u>Identification</u>	<u>Location</u>	<u>Capacity</u>	<u>Remarks</u>
Fuel tank # 1	F4-m9	16.21 L tons	No drain plug
Fuel tank # 2	F10-m17	37.95 L tons	No drain plug
Fuel day tank	F17-m18 Center	5.13 L tons	
Waste oil tank	F18-m19	3.2 L tons	
Sludge tank	F 24-25	4.2 L tons.(9.4	

- 9.5 Sludge tank: Once the tank drained, cleaned and inspected, proceed to a deep cleaning using International 950 degreaser (GMA 571). Brush all surfaces and rinse with a fresh water power washer (2000psi minimum). Once dry, apply a non-metallic epoxy putty in the deepest pits (allow 5kg of putty). Prepare all surfaces using the same method described in H.D.-10.2. Apply one coat of primer (Intergard 264), then two coats of Interseal 670HS. Surface to be treated is 16 sq. meters. Ventilate and let the paint cure completely.
- 9.6 For all hydrostatic tests, make sure that all of the pneumercator ports are plugged before pressurizing the tanks. All gaskets on the fuel tanks and fuel system will be Nitrile material.

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ITEM H.D.10

FRESH WATER TANKS

REMARKS

10.1 Drain the two (2) potable water tanks. Open access doors and ventilate. A breathable air certificate will be produced by a chemist and posted at the entrance of each tank. The certificate will be updated as necessary. Deep clean both tanks using International 950 (GMA571) cleaner. Brush all surfaces and rinse with fresh water, using a power washer (2000psi minimum). Clean the tanks of all residues, debris and carry them out of the tanks. Completely dry the tanks. Portable pumps will be necessary to strip the tanks.

10.2 Proceed to CCG and TCMS representatives' inspection for cleanliness. Proceed to the surface preparation as per manufacturer's recommendations, and also the attached technical bulletin # CT-013-000-EB-TE-001. The shipyard will also follow all parameters described in 3.6.7, section 7.F.12 of the fleet safety manual (document attached)

Caution: Prepare the surfaces using grinders with grinding discs that are specifically designed for aluminum only. Use a glass or granite based sand blast to prepare the areas that are difficult to reach, using the "vacu-blast" process. Clean and dry the two (2) tanks in order to remove all dust, contaminants and residues.

A finale inspection will be done by the CCG representative before applying the paint.

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ITEM H.D.10

FRESH WATER TANKS

REMARKS

10.3 Supply and apply two (2) coats of Interline 925, white on all surfaces of the two tanks (87 sq. meters), 14 mils dry minimum. Make sure that the paint completely cures and have the tank inspected by the CCG representative upon completion of paint curing.

Attention: During the work described in H.D.-10, special care must be taken to assure cleanliness during the whole process to avoid any contamination of the aluminum and the paint.

10.4 Once the paint job accepted and manhole covers installed with new gaskets (supplied by the shipyard), fill both tanks with fresh water, over-chlorine at 50ppm and have the ships water systems operated to make sure the tanks and the piping are treated. Wait 24 hours, drain both tanks and fill the tanks again.

Carry a 28 point test as per procedure 7.F.12 for the whole potable water system. The chief engineer will operate the potable water system.

An official potable water certificate for tanks and the distribution system will then be issued, then submitted to the chief engineer and the CCG representative once work completed, and before the end of the dry dock works.

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ITEM H.D.10

FRESH WATER TANKS

REMARKS

10.5 Carry a hydrostatic test on both water tanks in presence of the TCMS surveyor and the CCG representative. Plug all pneumericator openings before doing any pressure testing.

<u>Identification</u>	<u>Location</u>	<u>Capacity</u>
Fresh water # 3	M25 with starboard M28	29.35 L tons
Fresh water # 4	M25 with port F 28	10.85 L tons.

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ITEM H.D.11	HULL WELDING SEAMS	REMARKS
11.1	The contractor will allow 250 linear feet of welding (six 6 pass) on the ship's hull including the keel, the curtain plates and the port and starboard anchor pockets. Any variance shall be adjusted by the CCG representative and TCMS surveyor following hull inspection.	
11.2	Material used for welding work will have to be compatible with 5083 marine aluminum alloys for the hull and 6061-T6 for the curtain plates and bulwarks.	
11.3	The welders will have to be certified according to CSA W 47.2 standard's all positions. A copy of competence cards will be supplied to the CCG representative before the work begins.	
11.4	Contractor will have to meet the required conditions to carry out work according to recommendations' of the Canadian Welding Bureau.	
11.5	Welded joints that may require rebuilding are to be ground off.	
11.6	The contractor will supply the services of an expert technician to measure the hull's thickness where specified as per document B-1 before the welding work begins.	

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ITEM H.D.12

HULL PAINTING

REMARKS

12.1 Before beginning the sanding and paint works, all of the ship's deck equipment will be protected with **airtight** polyethylene film. Winches, rollers, deck equipment (electric and electronic equipment, cranes, FRC ramp including the craft. Accommodation openings, hawse pipes, crab haulers, bulwark openings will be covered). Protect all windows and portholes with masonite. All air vents on all decks will be covered with airtight polyethylene film.

Before the sanding work begins, the contractor will carry a complete inspection with the CCG representative, who will authorize the sanding work to start if the protection system is satisfactory.

12.2 Surface area to be considered is approximately 373 m², including the submerged surface of the hull, rudders and sea chests. The surface starts from the bottom up to the 7ft load line.

This surface will have to be cleaned, sandblasted with an abrasive (glass or granite) in order to obtain the commercial grade.

12.3 A temporary shelter will be fabricated and installed to the ship. The shelter will be weather tight in order to achieve the required conditions for the paintwork. The shelter will be disassembled once the paintwork done. The temporary shelter will protect the complete hull of the ship, up to the bulwarks top. The shelter will be heated to a minimum of 15deg. C for the complete duration of the paintwork.

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ITEM H.D.12

HULL PAINTING

REMARKS

- 12.4 The shipyard shall supply and will apply the International paint system, red RAL3000 using the required equipment and in accordance to manufacturer's recommendations.
- 12.5 All precautions will have to be taken in order to avoid the aluminum oxidation after the sandblasting. The paint will be applied as soon as possible, as per International paint recommendations and standards of application.
- 12.6 Protect all the hull openings, the propellers as well as the rudder bearings, sea chests, sea suction, echo sounders and any necessary area by the CCG representative to avoid any sand product intrusion during the sandblasting and painting.
- 12.7 A particular care will be taken during the application of the paint so that the minimum dry film thickness is obtained over the entire surface area. Avoid paint sags and runs while applying the paint system.
- 12.8 Allow a sufficient drying period recommended by the manufacturer is to be respected before the ship is set afloat.
- 12.9 **Apply one first coat** INTERGARD FPL274/FPA327 red epoxy (FPL274/FCA321 low temperature version), 5 mils thickness of dry film (6.3 mils wet film) from the keel up to the 7ft load line.
Apply second coat: of INTERGARD FAJ034/FAA262 grey epoxy, 5 mils thickness of dry film (9 mils wet).
Third and fourth coats: INTERLUX TRILUX II, anti-fouling (red 491), 2 mils thickness dry film per coat (5.5 mils wet film per coat).

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ITEM H.D.13	PAINT OF ACCOMMODATIONS	REMARKS
13.1	The surface area to be considered is 22sq. meters, as per surfaces sketch #A-1, between FR7 and FR21, at the levels of the main and navigation decks.	
13.2	Prepare surfaces to obtain the commercial grade, following the same precautions as mentioned in H.D.-14.2 and 14.3. Cover all lens, lights, windows, openings, controls, antennas and equipments in order to avoid any damage and intrusion of the sand product during sand blast.	
13.3	Apply one coat of INTERPRIME 539 VTA 538 on all bare aluminum surfaces, then apply one coat of INTERPRIME 198 red oxide, 3 mils thickness dry.	
13.4	Apply two (2) coats of INTERTHANE 990 white RAL9003 2 mils thick dry each on all surfaces.	

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ITEM H.D.14	PAINT ABOVE THE WATERLINE	REMARKS
14.1	The surface area to be considered is of approximately 440sq. meters including surface above the load line and both sides of bulwarks (top rail, inner and outer sides including the frames, gussets and structural elements).	
14.2	The shipyard shall supply material and labor for clean using sandblast to obtain the commercial grade (use glass or granite product) and ensure that the surface is acceptable to apply the paint.	
14.3	All the precautions will have to be taken in order to avoid aluminum oxidation after cleaning by applying the paint as soon as possible, according to standards of application and manufacturer's recommendations.	
14.4	Starting from the 7ft load line, apply one (1) coat of INTERPRIME 539, VTA 538 on the bare aluminum surfaces, then apply one (1) coat of paints INTERPRIME 198 red oxide, 3 mils thick dry per coat.	
14.5	Apply two (2) coats of INTERTHANE 990 Red RAL3000 on the entire surface area. Each coat is to be 002" thick.	
14.6	Care will be taken to obtain a clear and sharp separation of the 7ft load line.	

Réf.: Drawing # 02606-SF

15.1 The freeboard disks, the letters and the load lines as well as the draft marks fore and aft, port and starboard, will be painted with two (2) applications of INTERTHANE 990 white RAL 9003.

15.2 All the marking will have also to be repainted with two (2) applications. The name of the ship on the two (2) sides to the fore and aft as well as the port of registration. On the two (2) sides, diagonal white stripes and the demarking black stripes, inscriptions "GARDE CÔTIÈRE" and "COAST GUARD", official signs of the "Canada" flag and "Danger" with the "propellers" signs.

The "Pêches et Océans Canada" and "Fisheries and Oceans Canada" inscriptions on either side of the aft section of the ship must also be painted.

15.3 The contractor shall supply white paint for all inscriptions and symbols and the black paint for the black stripes, using INTERTHANE 990

Paint color code: white: RAL 9003
black: RAL 9004

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ITEM H.D.16

**ANCHORS, CHAINS AND
CHAIN LOCKER**

REMARKS

- 16.1 Lower the anchors and chains in the bottom of the dry dock.
Detach the anchors from the chains.
- 16.2 Open the manhole covers of the chain lockers and detach the chains from the chain locker. Anchors and chains are to be sandblasted.
- 16.3 Proceed with the cleaning of the chain lockers; remove the grids at the bottom of each trunk and all wood on the around the compartments then reinstall in the same order after the compartments will have been cleaned and inspected

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ITEM H.D.16

**ANCHORS, CHAINS AND
CHAIN LOCKER**

REMARKS

- 16.4 Measure the chains by section, every 90ft. Note the values obtained in the measurement booklet. Chains are to be painted with two coats of INTERGARD 264 gloss black RAL9004.
- 16.5 Reinstall the chains with ends reversed, so each anchor end is now attached to the chain locker.
- 16.6 Paint each detachable links with red and white paint, in an alternate manner (start with painting a red link, then paint the next one white, and go on) If there are no detachable links, paint the links as described (one link every 90 feet). Install around each shackle a stainless steel wire showing the number of 90 feet sections.
- 16.7 Close the whole with new gaskets, stainless steel 316 bolts and nuts.
- (*) There are 10 sections of 90 feet total.

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ITEM H.D.17

WATERTIGHT BULKHEADS

REMARKS

17.1 The two (2) watertight bulkheads have two openings each which need to be covered with 6061-T6 aluminum welded plates, same thickness as the bulkheads. There are two openings located at the bilge radius, next to the hull. Openings are about 1-1/2" diameter.

17.2 For each bulkhead, it will be necessary to remove paneling, furniture, piping and equipment in order to have decent access to complete the hot work safely. Remove the temporary aluminum plates and the epoxy putty that was previously installed over the openings.

Prepare the surfaces and weld an aluminum plate (same thickness of the bulkhead) in order to achieve a watertight result.

All surrounding compartments of the hot work zone will be protected against heat that will be generated during the welding process. A fire watchman will be present during the works and will stay as necessary, until fully cooled and safe work site.

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ITEM H.D.17

WATERTIGHT BULKHEADS

REMARKS

17.3 The identified bulkheads are the fwd engine room bulkhead (FR27) and the fwd bulkhead (FR10). Once the four (4) openings welded, carry a NDT with the TCMS surveyor and the CCG representative.

Attention: This work will be completed before paint work of the hull since there will be heat generated on the hull. As H.D.-18 concerns a compartment where the fwd E/R bulkhead is located, it will be important to coordinate the works to avoid time loss.

17.4 Once the works completed, reinstall everything that was removed previously (paneling, furniture, piping, equipment). Dispose of any dirt and debris generated by this job.

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ITEM H.D.18

AFT BATHROOMS BILGE WORK

REMARKS

18.1 In the crew's port & stbd bathrooms at lower deck, remove the floor finishing material till the aluminum plating. There is a layer of old ceramic and concrete between the aluminum and the actual floor finish.

Protect furniture and showers with polyethylene film. Avoid using duct tape to install the protections. Remove the two toilets and remove the aluminum floor plate to gain access to the bottom longitudinals.

18.2 Remove bilge water suction pipes (port and stbd), remove the float switches. Fabricate and install new pipe sections using stainless steel 316, SCH40, including fasteners and brackets all made of stainless steel 316. Supply and install new Nitrile gaskets. Allow one flange, 5 elbows and 6ft of pipe 2" dia. Once the cleaning and painting work completed (H.D.-18.3), install the pipe sections with insulated brackets (no contact between the brackets and the aluminum structure), and no contact between the pipes and the aluminum structure.

18.3 Deep clean the bottom and the welded structure using International 950 cleaner (GMA 571). Rinse generously with fresh water and dispose of the washing waters. Dry completely. Have the CCG representative to inspect once the cleaning completed.

18.4 Apply a non-metallic based (neither aluminum) epoxy putty in the corrosion pits. Once fully cured, prepare surfaces and apply two coats of INTERTUF 262 on all surfaces (8 sq. meters, including structural elements). Let cure completely before installing the piping.

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ITEM H.D.18

AFT BATHROOMS BILGE WORK

REMARKS

- 18.5 Modify the aluminum plates that were previously removed and cut an opening to install an inspection door. The inspection door will be ¼" higher than the plate and installed with countersunk hex head bolts (stainless steel 316), screwed in threaded holes that will be done in the floor plate. A doubler plate will be welded on each floor and will surround the inspection door opening.
- 18.6 Reinstall the bilge float switches with 316 stainless steel fasteners and brackets. Carry a operation test with the chief engineer to confirm that the floats are working as they should. Reinstall the modified plates with the proper supports and brackets supplied by the shipyard.

LOCALISATION OF HOLE TO REPAIR - LOWER DECK

- 19.1 Supply material and labor to replace a fire line pipe section. The piping will be made of SCH80 hot galvanized steel or SCH40 stainless steel 316.

The pipe has 2" diameter, two flanges ANSI 150. Three (3) 90deg elbows and a total length of 63 inches (see document C-1). Carry a 200psi pressure test on the assembled pipe with the CCG representative before installation. Install the pipe with new bolts and gaskets.