



Transport Canada
Atlantic Region

Transports Canada
Région de l'Atlantique

Marine Safety

Sécurité maritime

PO Box 1013
Dartmouth, NS
B2Y 4K2

January 29, 2015

Your file Votre référence

Our File Notre référence
CMS 8562-18117
RDIMS 10336414

Lengkeek Vessel Engineering Inc.
11 Portland Street, Suite 301
Dartmouth, Nova Scotia B2Y 1H1

Subject: CCGS "EARL GREY"

Attn: Mr. Rory Macdonald

Reference is made to your e-mail (RDIMS No. 10333554) forwarding for approval the following plans/data.

1. J14010-A01, sheet 1 of 2, rev 0, Arrangement I.W.O. New Stbd Davit and Modified Crane Boom Rest (RDIMS#10333590)
2. J14010-S03, sheet 1 of 2, rev 0, Structural Mods I.W.O. New Stbd Davit & Relocated Crane Boom Support (RDIMS#10333596)

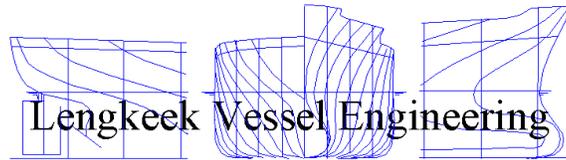
Items 1 and 2 have been examined and approved subject to any notations in red. Copies of the plans/data stamped and secured in .pdf format are attached. Please note that approvals for both drawings are for sheets 1 of 2 only.

A separate invoice will be issued from this office for examination of plans/data in accordance with the Board of Steamship Inspection Scale of Fees, Section 22(1).

Regards,

Michael Orr
Senior Marine Inspector
Transport Canada Marine Safety
Atlantic

encl



**"CCGS Earl Grey"
Installation Specification for New
Rescue Boat Davit**

For
**Department of Fisheries & Oceans /
Canadian Coast Guard**
Dartmouth, Nova Scotia



Prepared By:
Lengkeek Vessel Engineering Inc.
Report Number: J14010-R07, rev 1
Date: 8 Jan 2015

<i>Prepared By:</i>	<i>D. Careless</i>
---------------------	--------------------

<i>Checked By:</i>	<i>T. Newbury</i>
--------------------	-------------------

<i>LVE Form 72, rev0</i>

Revision Matrix

<i>Rev</i>	<i>Brief description of revisions made</i>	<i>Issued to client</i>
Rev 0	Issued to Client	14 Jan 2015
Rev 1	Section 3.6 added	28 Jan 2015

TABLE OF CONTENTS

1 SPECIFICATION DETAILS	1
1.1 SCOPE OF WORK	1
1.2 GENERAL INSTRUCTIONS	1
2 REFERENCES	1
3 STRUCTURE	3
3.1 RELEVANT DOCUMENTS	3
3.2 MATERIAL REQUIREMENTS	3
3.3 NEW DAVIT SUPPORTING STRUCTURE	3
3.4 RELOCATED CRANE BOOM SUPPORT AND NEW UNDERDECK SUPPORTING STRUCTURE	4
3.5 NEW CRANE BOOM REST STRUCTURE	5
3.6 MODIFIED CRANE CAB ACCESS LADDER	5
4 OUTFIT	6
4.1 RELEVANT DOCUMENTS	6
4.2 DECK WORKSHOP (DECK HEAD ITEMS)	6
4.3 LIFE RAFT RACK (BOAT DECK)	6
4.4 MODIFIED HANDRAILS (BOAT DECK)	6
4.5 MODIFIED VENT PIPE (BOAT DECK)	7
4.6 RELOCATED TIE-DOWN FITTINGS FOR CRANE HOOKS ETC.	7
4.7 RELOCATED ACCESS LADDER TO BATTERY ROOM DECK	7
4.8 PAINTING OF NEW AND RELOCATED STRUCTURE	8
4.9 INSULATION	8
5 ELECTRICAL	9
5.1 RELEVANT DOCUMENTS	9
5.2 ELECTRICAL CABLING	9
5.3 ELECTRICAL INSTALLATION	10
5.4 DAVIT ELECTRICAL COMPONENTS	10
5.5 ELECTRICAL TESTING	10
6 INSPECTION	12
6.1 GENERAL	12
6.2 INSPECTIONS	12
6.3 TRIALS	12

1 SPECIFICATION DETAILS

1.1 SCOPE OF WORK

This specification outlines the work to be completed onboard the CCGS “Earl Grey” to enable the installation at the Boat Deck level, starboard side, of a new davit and existing rigid inflatable rescue boat. The installation will require some areas of insert plating at the deck in way of the davit feet, and additional structural members at the underside of the deck to reinforce the existing structure in way of the new davit.

The davit installation will also entail relocation and modification of the existing Leibherr deck crane boom support crutch, which will be moved from the current Boat Deck location to the Raised Deck further inboard. Various items of existing outfit will also require relocation in order to accommodate the additional davit and rescue boat.

1.2 GENERAL INSTRUCTIONS

- .1 This specification shall be read in conjunction with the drawing, J14010-S03 indicating the precise extent of work and the use and location of specific materials.
- .2 Where ever the words “approved by”, “equivalent” or similar phrases are used in this specification, they shall be understood to mean the material, process, or item referred to.
- .3 Approval from the DFO/CCG is required if the Contractor wishes to deviate from any of the specified methods or recommended materials.

2 REFERENCES

- .1 CSA W47.1-03, Certification of Companies for Fusion Welding of Steel
- .2 CSA W59-03, Welded Steel Construction (Metal Arc Welding)
- .3 CSA 17, Canada Shipping Act - Tackle Regulations
- .4 CSA 28, Canada Shipping Act - Hull Construction Regulations
- .5 CSA 33, Canada Shipping Act – Marine Machinery Regulations
- .6 CSA 29, Canada Shipping Act - Hull Inspection Regulations
- .7 CSA 57, Canada Shipping Act – Safe Working Practices Regulations
- .8 MOSHR, Canada Labour Code – Marine Occupational Safety and Health Regulations
- .9 TP 127E, Transport Canada Marine Safety – Ship Electrical Standards

- .10 IEEE STD 45 – 1998 Recommended Practice for Shipboard Electrical Installations
- .11 Note: In case of conflict between any of the standards, then the most stringent requirements will prevail.

3 STRUCTURE

3.1 RELEVANT DOCUMENTS

Drawings

Drawing No: J14010-S03 Structural Modifications in way of New Starboard Davit
And Relocated Crane Boom Support

References

CSA 28	Canada Shipping Act - Hull Construction Regulations
CSA 33	Canada Shipping Act – Marine Machinery Regulations
CSA 29	Canada Shipping Act - Hull Inspection Regulations
CSA 57	Canada Shipping Act – Safe Working Practices Regulations
MOSHR	Canada Labour Code – Marine Occupational Safety and Health Regulations

3.2 MATERIAL REQUIREMENTS

All new steel plate and shapes shall be minimum Lloyds Grade ‘A’ or equivalent.

The Contractor shall supply all material required, including any material required to complete the work which is not explicitly identified in this specification. See also applicable structural guidance drawings for material requirements.

3.3 NEW DAVIT SUPPORTING STRUCTURE

The new davit is to be centered on frame 28, starboard side of the Boat Deck. At the location of the new Palfinger PRHE 35 davit, an insert plate shall be fitted in way of each of the six davit feet, or pads. The existing plating at these locations shall be cropped out, and cut free from the stiffeners at the underside of the deck. The edges of the existing plating and the exposed stiffeners shall be cleaned up and any rough edges ground smooth, before the fitting of the new insert plates at each of the six (6) locations.

The new insert plates shall be fitted so that the bottom, or moulded edge of the insert plates, shall be flush with the bottom or moulded edge of the existing deck plate. The insert plates shall be welded in place with a full penetration weld around the perimeter of each insert plate.

New longitudinal deck stiffening shall be fitted between frames 27 and 29, intercostally between the existing transverse deck beams. There shall be three lines of longitudinal deck stiffeners, composed of 5"x3"x5/16" angle bars, each line directly underneath the new insert plates and the feet of the new davit, the locations and details shall be as outlined on the guidance drawing, J14010-S03.

The new longitudinal deck stiffeners shall be welded directly to the underside of the existing deck plating and the new insert plating, suitably scalloped in way of the full penetration weld of the insert to the deck plating, and at the ends where they attach to the existing transverse deck beams.

3.4 RELOCATED CRANE BOOM SUPPORT AND NEW UNDERDECK SUPPORTING STRUCTURE

Installation of the new starboard davit shall require the relocation of the existing pipe crane boom support/crutch from its present location at the Boat Deck to a position on the Raised Deck area 625mm fwd of frame 23, and centered 1600mm starboard of centerline.

The boom support shall be cut free from its present location, and the deck plate prepared in way of the removal area.

At the new location, as shown on the guidance drawing, J14010-S03, Sht. 2, the boom support shall be considerably shorter than it is at present. Before any cutting of the existing crane boom support pipe takes place, an on-site determination shall have to be made, with the crane boom placed in its new 'at rest' location, of the accurate distance between the underside of the boom and the plating of the raised deck at the new location. An allowance shall be made for the installation of a new 12mm plate doubler to be fitted at the raised deck in way of the relocated boom crutch/support pipe.

The existing steel ladder currently fitted to the crane boom support pipe shall need to be modified to suit the shortened height of the support pipe at its new location. The decision of exactly where to cut and how best to modify the ladder will have to be made on site following a decision on exactly where the support pipe shall be cut, and the orientation of the boom support pipe and crane boom rest has been determined.

New 12mm plate brackets shall be fitted at the base of the relocated boom support pipe, one at each quadrant. These brackets shall be 762mm (30") high, and shall extend out from the edge of the support pipe for a distance of 425mm.

At the underside of the Raised Deck, new 6mm plate brackets shall be fitted longitudinally in way of the relocated boom support, between frames 23 and 24.

Currently, there is an existing longitudinal girder at the underside of the Raised Deck, at 1140mm off centreline, port and starboard. On the starboard side, in way of the relocated crane boom support, the existing transverse ordinary deck beam at frame 23 ½ shall be removed from the existing girder outboard to the starboard bulkhead. This deck beam shall be replaced with a transverse deep beam of similar scantling to the longitudinal girder, with a 6mm thick web plate of 300mm depth, and a face flat of 150mm x 12.5mm scantling. This face bar shall be cut short 25mm from the bulkhead, as detailed on the structural guidance drawing. A bracket shall be fitted to the existing girder at frame 23 ½, in line with the new deep beam, and welded to the existing deck beam, as shown on the guidance drawing.

The existing starboard bulkhead stiffener at frame 23 ½ shall be cut short to accommodate the new transverse deep beam above it, and shall be welded to it, with a

new 300mm x 300mm bracket of 6mm thickness fitted at the connection. See guidance drawing J14010-S03 for details.

3.5 NEW CRANE BOOM REST STRUCTURE

As the crane boom support is being relocated, and will now support the crane boom further along the crane boom than at its previous location, the taper of the crane boom will necessitate that the crane boom rest at the top of the support pipe will have to be rebuilt.

The new crane boom rest top assembly is comprised of a 12mm plate, which shall be welded to the top of the existing, trimmed, support pipe. Welded to the top of the plate are four (4) shaped boom rest stiffener plates, spaced as shown on the guidance drawing. Two (2) of these stiffener plates require three (3) holes to be drilled in them, in order to bolt in place a section of hardwood timber to act as a rest for the crane boom. This arrangement is shown in detail on the guidance drawing, J14010-S03, Sheet 2.

The ends of the shaped boom rest stiffener plates shall be welded to end plates, which follow the line of the tapered ends of the top plate on to which they are welded. These end plates shall have four (4) holes drilled in each to allow for the attachment of 'Delrin' side guides. These guides shall be similar to the ones that are already in place at the existing boom rest assembly.

At the underside of the boom rest plate, two (2) 12mm plate brackets shall be welded to the underside of the plate, and welded to the support pipe.

Note: In order to trim the existing crane boom support pipe to the correct length, and to fabricate a new, tapered boom rest to the top of it, clear of any of the fittings on the existing crane boom, it is strongly recommended that allowance be made for the provision of a simple, wooden mock-up of the crane boom support assembly. Use of the mock-up to accurately determine the correct lengths of all the pieces will be an extremely beneficial and cost effective measure, rather than to attempt a 'trial and error' method of modification with the existing boom support pipe and new boom rest assembly.

3.6 MODIFIED CRANE CAB ACCESS LADDER

Due to the fact that the Leibherr crane boom support and rest structure is to be modified, the crane will now stow so that it is angled slightly inboard, in order for the boom to suit the new support/boom crutch position. As a result, the existing ladder at the crane pedestal, to allow the operator access to the cab, shall need to be cut free from the pedestal and rewelded so that it lines up with the existing access walkway at the crane cab, when the crane is in its new, 'at rest' position.

4 OUTFIT

4.1 RELEVANT DOCUMENTS

Drawings

Drawing No: J14010-A01 Arrangement in way of New Starboard Davit and Modified Crane Boom Rest

4.2 DECK WORKSHOP (DECK HEAD ITEMS)

The existing deck head insulation at the underside of the Boat Deck in the Deck Workshop shall be removed in its entirety from the area where the additional structural members shall be fitted in way of the new davit. The insulation is a blown-in type, and will need to be scraped off the existing underdeck structure in that area.

Any items of outfit at the deck head that will hinder the installation of the additional underdeck stiffening shall require temporary removal until the additional steelwork is welded in place.

4.3 LIFE RAFT RACK (BOAT DECK)

The existing life raft rack at the starboard side of the Boat Deck shall be relocated clear of the position of the new davit. The rack shall be cut free from the pads on the deck in way of the pipe legs of the rack, and be relocated at the new position as shown on the guidance drawing, J14010-A01. The existing pads at the deck can be left in place, if they do not interfere with any new installation.

New pads shall be welded at the deck in way of the new position of the pipe legs of the relocated life raft rack. Pads shall be 6mm plate and sized as per the existing arrangement.

4.4 MODIFIED HANDRAILS (BOAT DECK)

The existing steel handrails at the starboard side of the Boat Deck shall be modified to suit the new davit and rescue boat installation, as well as the revised arrangement of outfit items at this location.

Removable chain shall be installed at the new location of the life raft rack, similar to the existing layout, and in way of the location of the Jacob's ladder.

Also, the hinged gate in the rails to accommodate the gangway when in use shall be modified/relocated to suit the new location, as outlined on the guidance drawing, J14010-A01. The flat bar stanchions in conjunction with the hinged gate will need to be modified/relocated to suit the revised location of the gangway gate, and the new chain handrail section.

New handrails shall be installed on the inboard side of the new FRC/davit, generally as shown on guidance drawing J14010-A01. New railings shall be the same construction and height as existing.

4.5 MODIFIED VENT PIPE (BOAT DECK)

An existing vent pipe at the starboard side of the Boat Deck adjacent to the handrails shall need be relocated clear of the new life raft rack location, and also clear of the location of the new davit and rescue boat, so as not to foul the launch and retrieval of the rescue boat. A suitable location for its relocation shall be determined in conjunction with the Chief Engineer of the vessel.

4.6 RELOCATED TIE-DOWN FITTINGS FOR CRANE HOOKS ETC.

In conjunction with the relocation of the crane boom support, the existing tie-down fittings at the Boat Deck, which are used to secure the main crane hook and the port and starboard whip hooks, and to prevent them from swinging loose when the crane is stowed, need also to be relocated to the Raised Deck area.

The guidance drawing, J14010-A01, Sheet 2, outlines basically where these existing fittings are to be reinstalled. The preliminary location dimensions as shown are for reference, the fittings shall be installed in conjunction with recommendations from the Chief Engineer of the vessel.

Additional notes on installation of crane hook tie-down fittings are as follows:

Main Hook: Should be secured to the area immediately outboard of the stbd-fwd corner of the Tow Winch Comp't soft patch, 700mm back from the aft bulkhead of the house.

Stbd Whip Hook: Should be secured to a point that is 2600mm back from the aft bulkhead of the house, and 700mm inboard from the stbd side of the Tow Winch Comp't.

Port Whip Hook: Should be just outside the soft patch, approx.. 2800mm back from the aft bulkhead of the house, and 700mm inboard from the stbd side of the Tow Winch Comp't. The port whip must **not** be secured to the soft patch.

The fittings shall be removed from their present locations, and the deck ground smooth in those areas where they have been removed. The affected areas shall be touched up and repainted to prevent corrosion, compatible with adjacent areas of the deck.

4.7 RELOCATED ACCESS LADDER TO BATTERY ROOM DECK

The new location of the stowed crane boom shall require the relocation of the existing vertical access ladder from the Tow Winch Top to the Battery Room Deck. The ladder shall be moved to the port side of the existing shore power connection box, between the box and the existing port damper door. The railings at the Battery Room Deck shall be modified accordingly to suit the revised location of the access ladder.

4.8 PAINTING OF NEW AND RELOCATED STRUCTURE

When all welding has been completed, on the new and relocated structure, coatings of primer and finish paint shall be applied to all affected areas to prevent any corrosion. Areas of weld shall be ground smooth, wire brushed and cleaned before any coatings are applied.

Coating thicknesses shall be as per paint manufacturer's specifications and recommendations, and the finished colors shall be compatible with the vessel's existing color scheme.

4.9 INSULATION

At areas where insulation has been removed or disturbed in order to install new structure, new replacement insulation shall be fitted to restore the insulation qualities of the applicable compartments.

The insulation shall be installed similar to the surrounding areas, and shall be covered with a suitable vapor barrier, and wire mesh if necessary, where required.

5 ELECTRICAL

5.1 RELEVANT DOCUMENTS

References

TP 127E	Transport Canada, Marine Safety, Ship Electrical Standards, Current Edition
	IEEE Std 45-1998 Recommended Practice for Shipboard Electrical Installations
MOSHR	Canada Labour Code - Marine Occupational Safety and Health Regulations
	Davit Installation Instruction Manual
	Davit Wiring Diagram
	CSA, IEC and other rules or codes as referenced in TP 127E

Other standards as identified for specific systems and/or equipment.
In case of conflict between any of the standards then the most stringent requirements will prevail.

5.2 ELECTRICAL CABLING

All new cables to be supplied and installed by the Contractor in conjunction with the installation of the new davit shall be of an approved marine type which is listed by Transport Canada Marine Safety Directorate.

All cables shall be copper.

Cables are to be generally installed on existing wire ways where possible. If new cable hangers are required they shall be supplied and installed by the Contractor and shall be of non-corrosive marine type. Power cables shall be restricted to no greater than double banking of cables. Cables are to be secured to the wire ways at intervals as required by TCMS. Special attention shall be paid to the physical separation of non-shielded electronic cables from power, control and lighting cables.

Miscellaneous "local" cable runs shall be secured with approved clips and studs (Nelson or equal).

In exposed areas and any location where cables may be subject to mechanical damage, they shall be protected in accordance with section 12 of TP 127E.

Wire ways shall be routed to avoid areas of high fire risk, (such as over exhaust pipes), except as required in such areas to provide service. If it is necessary to route cables in

proximity to such areas, then suitable heat shields are to be provided by the Contractor.

Transition pieces through water tight, gas tight and fire proof bulkheads and decks shall be in accordance with the requirements of TP 127E.

Cables shall be secured using approved fastening methods. Cable terminations in enclosures shall have fittings approved for the applicable environment, and shall be connected via terminal blocks where practicable.

All cables, new and re-installed, shall be tagged with circuit identification at all points of connection and on both sides of bulkheads, decks and barriers. The tags shall be metal, compatible with the cable sheath and shall have the circuit designation embossed thereon. Both ends of the tags shall be taped to the cable with metal tape or ty-raps.

5.3 ELECTRICAL INSTALLATION

Prior to disconnecting and/or cutting any cables, the Contractor shall isolate any voltage present in the cable. Any cables which require splicing must be disconnected and conductors isolated at both ends prior to cutting.

The Contractor is responsible for clearly identifying and tagging any cables which need to be pulled back, removed and/or cut in order to assure the correct re-installation as described in this specification. Any essential service cables which have to be cut will require a temporary splice in order to maintain that service (e.g. fire detection).

Under the direction of the davit manufacturer field representative, the Contractor shall make the necessary connections to provide the power supply needed by the davit control station and the hydraulic pump motors.

All new cables to be supplied and installed by the Contractor in conjunction with the installation of the new davit shall be of an approved marine type which is listed by Transport Canada Marine Safety Directorate.

5.4 DAVIT ELECTRICAL COMPONENTS

The necessary electrical components for the new davit installation shall be fitted at the vessel following consultation with the vessel's Chief Electrician and Chief Engineer. The Emergency Generator Room and the Deck Workshop Compartment, at the Main Deck level, have both been identified as having available space for the necessary switchboard and junction box connections etc., the exact locations of which shall be determined following further consultations with shipboard personnel.

5.5 ELECTRICAL TESTING

Megger tests shall be conducted in accordance with the requirements of TP127. The insulation resistance shall be measured by self-contained instruments such as a direct reading ohmmeter of the generator type, applying a voltage of 440 volts. When an insulation test is made on a circuit incorporating capacitors of a total capacitance exceeding 2 microfarads, an insulation tester of the constant-voltage type shall be used.

The davit and all of the associated electrical and control systems shall be functionally tested by the Contractor in accordance with the manufacturer's instructions. All tests shall be conducted under the direction and supervision of the davit manufacturer's Field Service representatives.

6 INSPECTION

6.1 GENERAL

The work shall be carried out to the satisfaction of the vessel's Chief Engineer and the Project Manager from Department of Fisheries and Canadian Coast Guard.

6.2 INSPECTIONS

Inspections shall be carried out by the Chief Engineer and/or the Project Manager from Department of Fisheries and Canadian Coast Guard. The representative shall conduct a final inspection to determine acceptance of the work. The work shall also be inspected by the Contractor to ensure the methods of installation and workmanship conform to the drawings and specification.

A physical inspection of all welding shall be carried out by the Contractor to ensure that all welds are satisfactory and contain no visible defects or deficiencies.

Weld deficiencies shall be recorded, reported and repaired, and then re-inspected and re-tested by the Contractor.

6.3 TRIALS

The new davit and boat installation shall be tested and trialled to ensure correct operation as per the davit supplier's recommendations, in both launching and retrieval modes of operation.

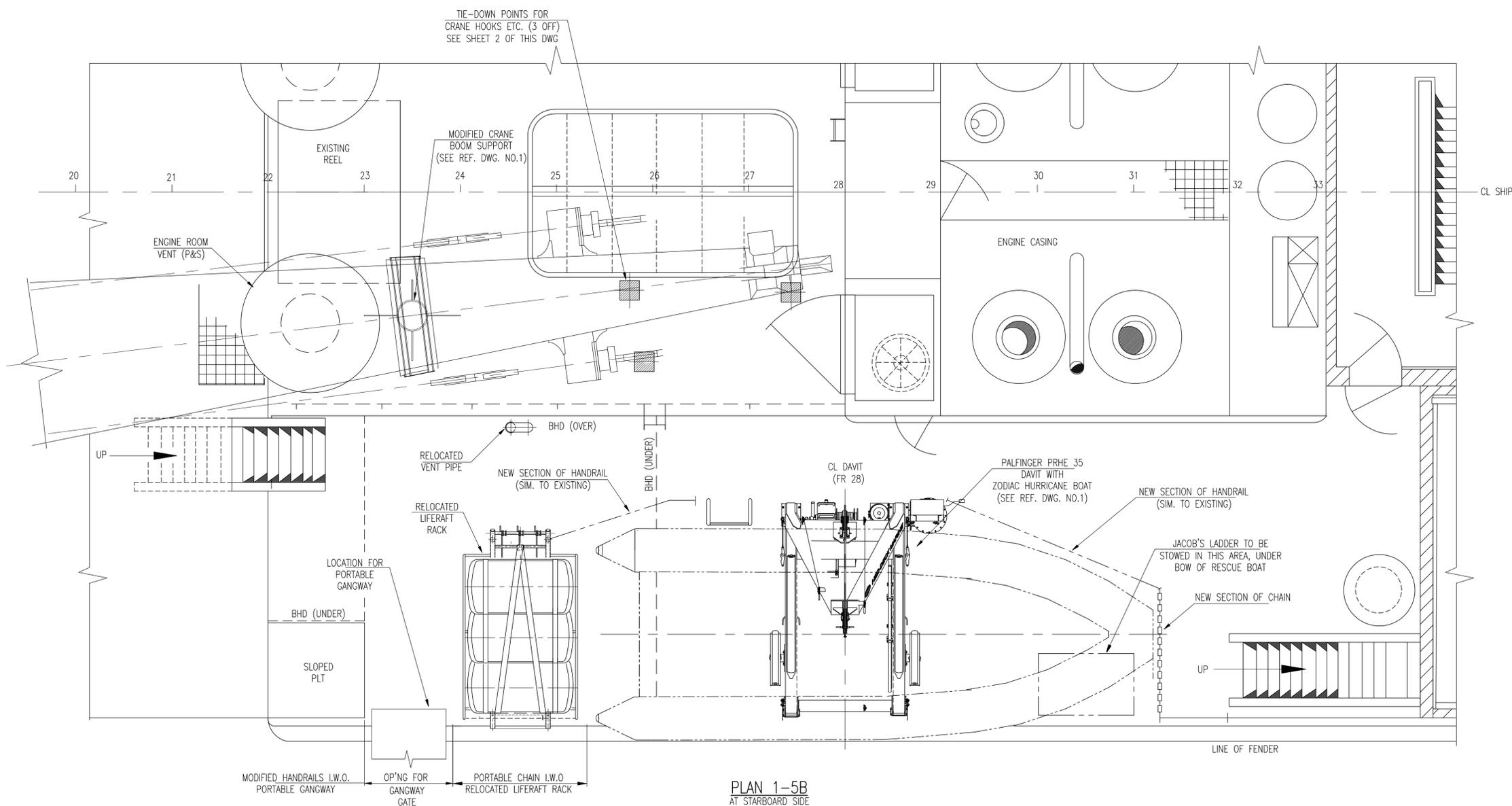
Load and function testing shall be carried out in accordance with any Lloyds Register requirements and in accordance with any manufacturer's procedures.

REFERENCE PLANS:

No.	Dwg No.	DESCRIPTION
1	J14010-803	STRUCTURAL MODS I.W.O. NEW STBD DAVIT/ MODIFIED CRANE BOOM SUPPORT

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
2. FRAME SPACING 1250mm THROUGHOUT. BEAM SPACING 625mm.
3. NEW STEELWORK SHALL BE MINIMUM LLOYDS GRADE 'A' OR EQUIVALENT. IT SHALL BE FREE OF RUST, SCALE, DIRT AND GREASE, GIVEN TWO COATS OF SUITABLE SHOP PRIMER, FINISH COATINGS SHALL BE TO OWNER'S SPECIFICATION.
4. ALL FILLET WELDING TO BE 5mm LEG LENGTH, DOUBLE CONTINUOUS, UNLESS NOTED OTHERWISE. BUTT WELDS TO BE FULL PENETRATION BEVEL TYPE.
5. ANY EXISTING PAINTWORK AND/OR STEELWORK DAMAGED BY BURNING OR WELDING SHALL BE REPAIRED TO THE OWNERS SATISFACTION AND REPAINTED UTILIZING A SYSTEM COMPATIBLE WITH THE SHIP'S EXISTING PAINT SYSTEM.
6. **ALL DIMENSIONS TO BE CHECKED/VERIFIED AT SHIP PRIOR TO FABRICATION.



PLAN 1-5B
AT STARBOARD SIDE
I.W.O. LOCATION OF NEW DAVIT
& RELOCATED CRANE BOOM SUPPORT
SCALE - 1:30

Rev	Date	By	Remarks

THIS DRAWING, DESIGN CONCEPT, AND SPECIFICATIONS ARE THE PROPERTY OF LENGKEEK VESSEL ENGINEERING INC. AND SHALL NOT BE COPIED IN ANY MANNER, USED FOR MANUFACTURE, SOLD, TRANSMITTED, COMMUNICATED TO A THIRD PARTY, OR USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS SUPPLIED, WITHOUT THE EXPRESS WRITTEN CONSENT OF LENGKEEK VESSEL ENGINEERING.



Client: CCG/DFO
Title: CCGS 'EARL GREY' ARRANGEMENT I.W.O. NEW STBD DAVIT AND MODIFIED CRANE BOOM REST

Drawn By: DC	Date: 08/01/15
Checked By: TN	Scale: AS NOTED
Approval/Rev	Rev: 0
Client: 29/01/15	DWG NO: J14010-A01
Class:	
Flag: 29/01/15	Sheet No: 1 of 2