Additional Requirements:

Repairs to 30 ft Aluminum Barge "A3" as per attached specification and Drawing:

1) Engine Room Bottom Plate Renewal and Structural Additions

2) Bottom Plate and Structural Additions Drawing:

The Contractor is required to remove the barge from the Coast Guard base on Southside Road.

All repairs are to be completed at the Contractor's facility in an enclosed heated building.

The Contractor's bid shall include the cost of lifting and transporting the barge to/from CG base.

All work shall be completed by April 15th, 2014.

MSI Marine Services International Ltd.

Canadian Coast Guard
30’ Aluminum Self Propelled Barge

Engine Room Bottom Plate Renewal and Structural Additions

Issued
January 2014

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Project Number 2520

Revision 0

Section 1 – General Information

1.1 Introduction

The Canadian Coast Guard barge A3, named Adrienne's Pride is a 30' – 0" aluminum constructed self propelled barge which is currently assigned to the CCGS Henry Larson. The barge was built in 2001 to provide assistance with buoy tending operations while also acting as a landing craft during scientific missions and other missions as required by the vessel officers. The barge is stowed, launched and recovered on the starboard side boat deck by means of a crane using wire ropes shackled to four lifting points located about the engine room compartment.

During a start-up inspection of the barge, water was noted dripping from the hull while in the stored position onboard the CCGS Henry Larsen. Further inspections of the barge revealed water within the bilge of the engine room compartment and multiple cracks of varying degrees located on the bottom plating near the aft engine room bulkhead. A total of eight cracks were noted while three additional cracks in the bottom plating had been previously repaired.

This specification and associated drawings describes the bottom plating renewal and additional structural upgrades within the engine room compartment.

1.2 Extent of Renewals

The extent of the renewals are detailed in section two below and are identified on the supplied MSI drawings. In general, the renewals are limited to the bottom plating within the engine room compartment between frames 5 – 8. Additional structure consists of new longitudinals fitted on the centerline, port and starboard sides of the engine room compartment and bulkhead stiffeners in line with the new longitudinals.

1.3 Supplied Drawings and Information

Attached for use are the MSI drawings covering this renewal and are as follows:

- 2520-01-02 Bottom Plate & Structural Additions

1.4 Owner Supplied Materials

The owner will not supply any materials or labour. All materials and labour will be contactor supplied.

1.5 Contractor's Responsibility

It is the contractor's responsibility to follow all applicable federal, provincial and local regulations. The contractor is to adhere to all DFO-Coast Guard / PWGS work requirements and must complete the work to the satisfaction of both the representative from Canadian Coast Guard Vessel Support and the attending TCMS Surveyor if necessary.

The contractor is also responsible to provide all materials, labour, lighting, ventilation, staging and lifting capacity to complete the required tasks. The contractor is also responsible for all

temporary enclosures to facilitate the work, and finally, all clean up and disposal of debris generated due to the work.

1.6 Owner's Requirements

It is the owner's intention that the successful contractor will be responsible to complete all aspects of this upgrade. The owner will provide the contractor with vessel access 24 hours per day for the purpose of completing the work scope.

Section 2 – Materials & Workmanship

2.1 Materials

All aluminum plate shall be new 5086 H116 or 5083 H116.plate. Extrusions and shapes shall be new 6061 T6.

2.2 Welding

This renewal requires that the Contractor be currently certified by the Canadian Welding Bureau (CWB) to standard CSA W47.2M, Division I, II or III – Certification of Companies for Fusion Welding of Aluminium. The Contractor shall provide the following:

1. Current letter of validation from the CWB indicating compliance with standard CSA W47.2M 1987, Division I, II or III.
2. Approved procedure data sheets for each type of joint and welding position that will be involved with this repair.
3. Current Welders Ticket for each individual welder that will be involved during the repairs.

All hull and bulkhead welding shall be continuous welding. All primary structure, web frames, girders shall be double continuous fillet welding. Secondary stiffening shall be welded with four inch eight staggered intermittent welds. All other welding shall be continuous.

The Contractor shall arrange a welding inspection from an organization currently certified to the latest CSA Standard W178.1. The completed repair work is to be 100% visually inspected by the welding inspector after welding is completed.

The contractor shall remove weld splatter and smooth weld seams and sharp edges and remove grease, smoke, and soot marks.

2.3 Inspection & Testing

The work is to be completed to the satisfaction of a representative from Canadian Coast Guard, Vessel Support. The Contractor shall arrange a welding inspection from an organization currently certified to the latest CSA Standard W178.1. The completed repair work is to be 100% visually inspected and 100% Liquid Penetrant Inspection on all bottom plating and double continuous fillet welds. The contractor shall be required to obtain up to 10 radiographs on the bottom plating renewal area. The location of radiographs shall be determined by the CCG Vessel Support. Radiography shall meet the requirements of the ASTM Standard ER142, with acceptance criteria as per the CSA W59 Welding Standard.

All costs associated with radiographs (x-rays) and liquid penetrant inspections of welded connections to be included in the Contractors bid.

2.4 Documentation

Three copies of the following documentation are to be supplied to the Canadian Coast Guard Project Officer responsible to the Barge prior to commencing the work scope:

- Material Certificates for Plate & Sections
- CWB Certificates for Welders
- CWB Certificates for Weld Supervisor
- CWB Weld Procedures
- CWB Weld Data Sheets
- LPI / X-Ray Testing Documentation

2.5 Protection of Area from Additional Damage and Disruption

The contractor is to take all necessary precautions to protect the vessel and machinery from physical damage and contamination due to the generated smoke.

Section 3 – Details of Repair

3.1 Scope of Plating Renewal

The contractor shall complete bottom plating renewals within the engine room compartment as follows:

1. The location of the crop and renewal is shown on the supplied MSI drawing which extends 6" aft of the water tight bulkhead located at frame 5 to 6" forward of the water tight bulkhead located at frame 8. The renewal does not encompass the bottom plating in way of the engine seat structure which shall be kept a distance of 4" – 6" away from the engine seat structure, as shown on the supplied drawing. The total area of plating renewal is approximately 70 square feet. The original bottom plate thickness is 1/4" plate, however the bottom plate renewal will be completed with 3/8" plate. 1/2" insert plates are to be installed within the bottom plating in way of the barge lift points located at the forward engine room bulkhead (Fr. 8) and within the shaft compartment aft of the engine room at frame 4. Brackets are to be field fitted in way of lifting point end connections. Brackets shall be 3/8" plate with size and location determined on site during repairs.

3.2 Scope of Structure Additions

The contractor shall complete structure additions within the engine room compartment as follows:

1. New port side structure consists of a bottom girder and bulkhead stiffeners located 1' – 5 1/2" from the hull side, in line with the main deck longitudinal. The bottom girder (6" x 3/8" flatbar) will be inter-costal to frames 6 and 7 and will be connected using a 6"x6"x3/8" bracket to the new bulkhead stiffener (4"x3/8" flatbar). The

forward bulkhead stiffener end connections will be bracketed similar to the aft bulkhead stiffener but will be sniped in way of the hydraulic tank access. The sniped end portion of the new bulkhead stiffener located at frame 8 will end on a new 3"x3/8" transverse bulkhead stiffener to be installed on the forward portion of the bulkhead at frame 8.

2. New starboard side structure consists of a bottom girder and bulkhead stiffener located 1' – 5 1/2" from the hull side, in line with the starboard side main deck longitudinal. The 6"x3/8" flatbar bottom girder will be intercostal to frames 6 and 7 and will have end connections that are bracketed to the new bottom girder and the existing deck longitudinal.

3. A new partial centerline girder consisting of 6"x3/8" flatbar shall be fitted on centerline between the water tight bulkhead located at frame 5 extending to the bottom transverse located at frame 6.A 4"x3/8" flatbar bulkhead stiffener shall be fitted to the bulkhead located on centerline and shall extend up to the bottom transverse bulkhead stiffening. A 6"x6"x3/8" bracket shall complete the connection of the new bulkhead stiffener to the new centerline girder.

3.3 Interference Items

The following list of interferences has been identified which the contractor shall temporarily remove and store for re-installation upon completion of the work scope:

1. Fuel tank located on the port side of the engine room compartment adjacent the aft water tight bulkhead. The tank is located directly above the bottom plate renewals and in way of the structure additions.
2. Electrical system components are located on the port side of the engine room compartment, aft of the fuel oil tank. The batteries are located directly above the bottom plate renewals and in way of the structural additions.
3. Hydraulic operated pump located inboard of the port side fuel tank will provide an interference with bottom plating renewal.
4. Stairs providing access to the port side engine room. Stairs legs are welded to tabs that are welded to the bottom plate.
5. Hydraulic hoses located on the starboard side engine room compartment.
6. Bilge strum box and bilge pump located near the aft engine room bulkhead.
7. 4" schedule 80 half pipe bottom fendering in way of bottom plate renewals. The pipe bottom fendering shall be removed and replaced with new in way of the bottom plate renewals.

While the engine and transmission does not provide a direct interference with the repair work, all machinery and equipment remaining in place during the repairs shall be properly covered to prevent any damage during the repairs.

Section 4 – Installation

4.1 Sequence of Repairs

It is intended that bottom plating be cropped and renewed in three stages; port, center and starboard sections. Upon installation of new bottom plate, new structural additions can be installed at the contractor's discretion. Wooden blocking shall be placed in way of the engine/transmission seat structure to provide support during repairs to the bottom plating.

4.2 Arising Work

If, during the completion of this work, it is evident that additional work items are required to complete the general scope of work, the contractor is to immediately notify the owner's representative or the Project Engineer.
The arising work will be defined and agreed to by the owners before such work is undertaken.