E-5

APPENDIX “A”

Lengkeek Vessel Engineering

"CCGS Sir William Alexander"

Installation Specification for New Sludge Tank and Associated Piping

For

Department of Fisheries & Oceans / Canadian Coast Guard

Dartmouth, Nova Scotia

Prepared By:

Lengkeek Vessel Engineering Inc.

Report Number: J15003-R01, rev 0

Date: 12 Feb 2015

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LVE Form 72, rev0	

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Revision Matrix

Rev	*Brief description of revisions made*	*Issued to client*
Rev 0		

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1 SPECIFICATION DETAILS

1.1 SCOPE OF WORK

This specification outlines the work to be completed onboard the CCGS "Sir William Alexander' to enable the installation at the Upper Deck, casing level, starboard side, of a new Sludge Tank and bulkhead mounted support structure. The installation will include the rerouting of an existing fuel line to clear the new tank installation, and also shall incorporate the installation of a new sludge tank vent, that shall run from the Sludge Tank installation up the ship's casing to the starboard side of the existing funnel at the Bridge Deck level.

1.2 GENERAL INSTRUCTIONS

.1 This specification shall be read in conjunction with the guidance drawings, J15003-S01 and J15003-M01, 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 GENERAL NOTES

3.1 ON-SITE PROJECT OFFICER:

All work to be completed to the satisfaction of the on-site Project Officer who, unless otherwise advised, will be the Chief Engineer of the ship, or his designated representative.

Upon completion of each item of the specification, the Chief Engineer shall be notified so that he may inspect the work prior to the complete closing up of any work.

Failure to give notification does not absolve the Contractor of the responsibility of providing the Chief Engineer with the opportunity to inspect any item.

Inspection of any item by the Chief Engineer does not substitute for any required inspection by Transport Canada Marine Safety (TCMS), and/or Lloyds Register (LR), Public Works and Government Services Canada (PWGSC) or Health Canada (HC).

3.2 SAFETY

There is a safety annex attached to this specification entitled “FLEET SAFETY MANUAL REQUIREMENTS”. In addition to the detailed requirements within the specification, this annex contains excerpts from the document DFO 5737, “FLEET SAFETY MANUAL”, that are applicable to contracted refit and dry-docking situations.

All contracted work shall be conducted in compliance with the requirements of the Canada Labour Code, Part 2.

Potential Contractors shall include with their bids the name of their Safety Manager or Supervisor who will ensure that these requirements for workplace safety are met

NOTE: Under the Canada Labour Code, Part 2, the Coast Guard has an obligation to exercise due diligence to ensure the safety of Contractors’ workers as well as the ship’s crew.

3.3 SUB-CONTRACTORS

All conditions, stipulations etc. listed in the General Notes apply to any Sub-Contractors employed by the Main Contractor to carry out work on any Specification item.

3.4 CHEMIST'S CERTIFICATES

The Contractor shall supply the Chief Engineer with Marine Chemist's Certificates in accordance with TCMS TP 3177E before any cleaning, painting or hot work is commenced in confined spaces or machinery compartments.

Certificates shall clearly state the type of work permitted and shall be renewed as required by the regulations.

The Contractor and his sub-Contractors are advised that any work carried out in confined spaces as defined by the Canada Labour Code (CLC) and relevant provincial legislation must fully comply with all provisions therein.

3.5 DURATION OF SCHEDULED WORK

The Contractor shall provide sufficient personnel, material, and equipment resources to complete the specified work, within the period of the contract.

Extra effort required due to the Contractor's failure to maintain his production schedule will not be paid for by CCG.

3.6 PROTECTION

The Contractor shall provide adequate temporary protection for any equipment or areas affected by his work.

The Contractor shall take proper precautions to maintain in a proper state of preservation any machinery, equipment, fittings, stores or items of outfit which might become damaged by exposure, movement of materials, paint, sand, grit or shot blasting, airborne particles from sand, grit or shot blasting, welding, grinding, burning, gouging and painting.

Any damage shall be the responsibility of the Contractor.

3.7 WELDING

The Contractor shall be currently certified by the Canadian Welding Bureau in accordance with Standard W47.1-03 "Certification of Companies for Fusion Welding of Steel Structures," Division 1, 2.1 or 2.2.

All personnel performing welding shall be approved by the Canadian Welding Bureau.

Welding materials to CSA W59-03.

3.8 AUXILIARY SERVICES

Contractor shall include in the quotation the costs of any and all transportation, rigging, staging, slinging, cranage, removals, and installations of parts and equipment such as may be required to carry out work.

3.9 SERVICE CONDITIONS

All materials supplied and work carried out by the Contractor shall be adequate to meet service conditions of outside air temperature of minus (-) 40^0 C to plus (+) 35^0 C; for exterior installations.

All materials supplied and work carried out by the Contractor shall be adequate to meet service conditions of wind velocity of 50 knots; for exterior installations.

All materials supplied and work carried out by the Contractor shall be adequate to meet service conditions of water temperature of minus (-) 2^0 C to plus (+) 30^0 C; for exterior installations.

All materials supplied and work carried out by the Contractor shall be adequate to meet service conditions of shock loading of 2.5g horizontal, 1.5g vertical; for all installations.

3.10 HOT WORK & FIRE WATCHES

Any item of work involving the use of heat in its execution requires that the Contractor advises the Chief Engineer prior to starting such heating and upon its completion.

The Contractor shall provide sufficient suitable fire extinguishers and a fire watch during any heating and until the work has cooled.

Ship's extinguishers are not to be used except in an emergency.

3.11 RELOCATIONS

Any piping, manholes, parts and/or equipment requiring removal to carry out specified work and/or to gain access shall be refitted upon completion with new jointing, anti-seize compound, clamps and brackets as applicable (Contractor supply).

3.12 TEMPORARY LIGHTING & VENTILATION

Temporary lighting and/or temporary ventilation required by the Contractor to carry out any item of this specification shall be supplied, installed and maintained in safe working condition by the Contractor and removed on completion of the related work.

3.13 VESSEL CLEANUP

The principal work areas, as defined by this specification, shall be cleaned to "as new condition" on completion of the contracted work.

The Contractor shall ensure that all spaces, compartments and areas of the ship outside of the principal areas of work are “as clean as found” when work is completed.

3.14 MATERIALS & TOOLS

All materials, unless otherwise specified, to be supplied by the Contractor.

Contractor to supply all necessary tools to perform specified work.

Ship's tools and equipment will not be available for Contractor's use except for specialty tools that will be issued by and returned to the Chief Engineer in good condition.

3.15 FIRE SAFETY SYSTEMS

Whenever any work is being carried out involving a ship's firefighting or fire detecting system, it shall be done in such a way as to leave the vessel and any persons aboard with adequate protection against fire at all times. This may be so accomplished by the removal or disarming of only a portion of the system at a time, by replacement with spares while work is in progress or by other reasonable means acceptable to the Chief Engineer.

3.16 SMOKING

The Public Service Smoking Policy forbids smoking in Government ships in all areas inside the ship where Contractor personnel will be working.

Contractor shall inform workers of the smoking policy and ensure that it is complied with in all cases.

3.17 ACCESS

The following areas are out of bounds to Contractor's personnel except to perform work as required by the specification: all cabins, offices, Wheelhouse, Control Room, public washrooms, cafeteria, dining room and lounge areas.

Contractors to ensure that no workers bring meals onboard the ship.

3.18 AVAILABILTY OF FACILITIES

The modifications to the vessel will be carried out at a facility yet to be determined.

If the Contractor does not have access to washroom facilities off the ship, a designated washroom on board will be open during regular working hours for Contractor’s use. If the cleanliness of the washroom is adversely affected by this usage, Coast Guard reserves the right to stop Contractor use of the facility.

Contractors are advised that normal working hours for ship’s personnel during alongside refit periods are from 0800 hours to 2000 hours, seven (7) days a week, excluding statutory holidays. Permission to work outside of these hours on the ship must be obtained by the Contractor from the Chief Engineer in advance.

Contractor machinery located on the ship or the dock can only be run from 0700 hours to 1900 hours, Monday to Saturday. Contractor to ensure that any equipment used meets the current noise abatement regulations.

3.19 DOCKSIDE CLEANUP

The Contractor is responsible for the complete cleanup of adjacent dock areas used by his personnel and/or equipment during and after completion of the contracted work. This shall include, but not be limited to the following:

1) Removal of all dirt, grit and debris;
2) Removal of all staging, containers and equipment
3) Immediate cleanup and legal disposal of any leaked oils, solvents or other hazardous materials.

4 STRUCTURE

4.1 RELEVANT DOCUMENTS

Drawings

Drawing No: J15003-S01 Structural Modifications To Suit New Sludge Tank Installation

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

4.2 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.

4.3 NEW SLUDGE TANK SUPPORTING STRUCTURE

The new sludge tank is to be fitted at the forward side of the bulkhead at frame 72. The existing insulation and metal sheathing on the bulkhead shall be removed at the locations of new angle supports that shall be welded on the bulkhead. These supports shall be as shown on the guidance drawing, J15003-S01, and shall be drilled to suit the bolt holes in the framing which makes up the tank structure.

Additional bolt holes shall be drilled in the Sludge Tank support structure, and these two additional holes per side shall be drilled through both the new support angles and the support structure of the Sludge Tank.

All metal sheathing and insulation that was removed to facilitate installation of the support structure for the new sludge tank, shall be reinstalled as per the existing arrangement. If damaged during removals, new insulation of the same type shall be installed along with new metal sheathing and insulation pins/clips.

4.4 NEW SLUDGE TANK DRIP TRAY

The sludge tank and its associated valves require a steel drip tray to be fitted underneath, to catch any of the contents that might leak. The general outline of the tray shall be generally as shown on the guidance drawing, J15003-S01. It shall be formed of 3/16" plate and shall have an upstand all round of approx. 65mm. The existing grating at the flat underneath the sludge tank shall be cut and removed in way of the area of the drip tray. The drip tray shall be intermittently welded to the existing grating support structure underneath. The existing coaming structure around the exhaust pipe shall be modified also to suit the new drip tray structure.

An existing drip tray fitted at this level in way of the new tank installation shall be removed.

5 MECHANICAL

5.1 RELEVANT DOCUMENTS

Drawings

Drawing No: J15003-M01 Piping Modifications To Suit New Sludge Tank Installation

5.2 MODIFICATIONS TO EXISTING FUEL LINE

The existing 1½" NB fuel line running down the forward face of the bulkhead at frame 72 shall be modified in order to remain clear of the tank and the new drip tray installation. Immediately above the location of the tank, there is an existing overhang in the insulation and metal sheathing on bulkhead 72 where the fuel piping is situated. The existing fuel line is to be cut immediately below this overhang, and a 90° elbow welded on to the end of the pipe. A new section of 1 1/2" NB fuel piping shall then be fitted, to run to starboard and then forward just above the top of the tank, and shall then turn down clear of the drip tray, to the underside of the level of the grating.

The new line shall run aft below the level of the existing grating, and tie-in to the existing fuel line at a point below the existing radiused section of pipework. The new connection to the existing line shall be carried out using a new 90° elbow and a straight spool of new piping, which can either weld to the existing line where it will be cut, or if space permits between the pipe and the face of the metal sheathing over the insulation, a pair of new 1½" pipe flanges. Contractor shall allow for fitting the flanges.

5.3 MODIFICATION TO SLUDGE TANK PRESSURE REGULATION N.R. VALVE

The forward face of the Sludge Tank has a flanged Pressure Regulation Non-Return Valve fitted. In order to clear the existing exhaust pipe within the space, the flanged valve shall be rotated 180° from its current location, so that the hand wheel is facing away from the existing exhaust pipe.

5.4 ADDITION OF SLUDGE TANK VENT LINE

The sludge tank will require a DN50 (2" NB) vent line to be fitted at the flanged connection on the top of the tank. The intention is to run the line forward from the tank connection, and then starboard to a suitable location, where the pipe can then turn 90° and run vertically through a clear space between existing pipework within the casing.

At 300mm above the Bridge Deck level, the pipe shall turn 90° to starboard, and run horizontally and pass through the starboard side of the funnel plating. Immediately outboard of the funnel side, the pipe shall run vertically 300mm and shall be fitted with a welded flange. The flange shall be suitable for mounting a DN50 (2") Winteb WIN2000 Air Pipe Head. The flanges are to be fitted with a suitable gasket to isolate the aluminum vent head from the steel piping. See guidance drawing J15003-M01.

The other piping connections to the sludge tank are to be carried out separately, and are not included within the scope of the guidance drawings or this technical specification.

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

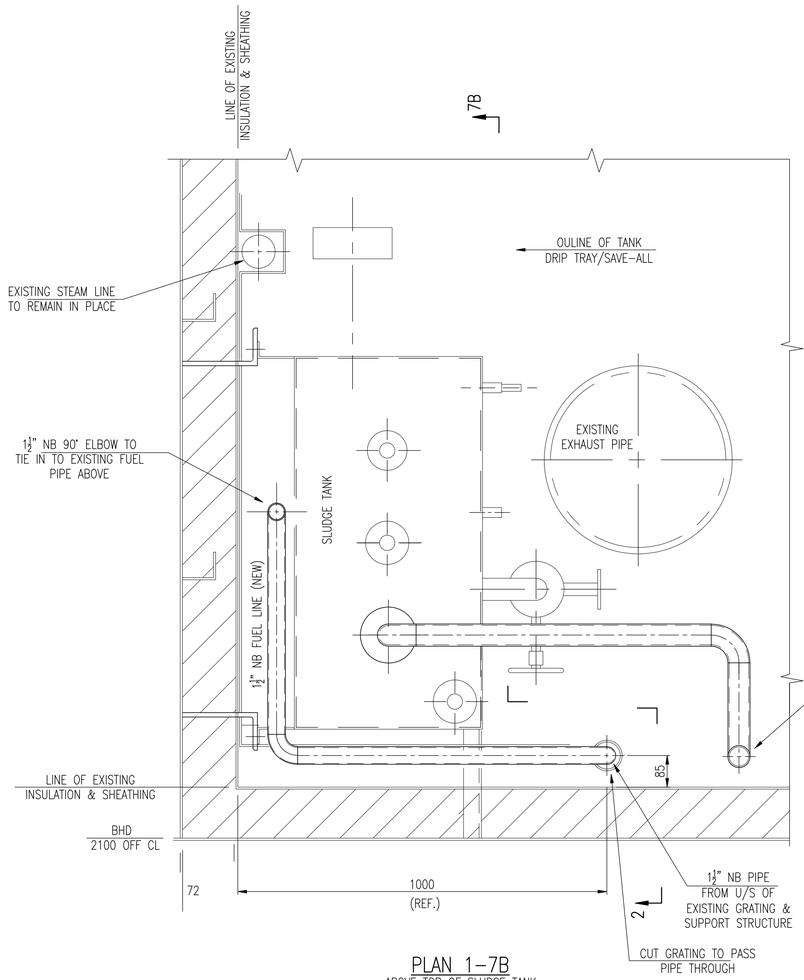
Inspections shall be carried out by the Chief Engineer and/or the Project Manager from Department of Fisheries and Canadian Coast Guard. The representative shall conduct a final inspection to determine acceptance of the work. The work shall also be inspected by the Contractor to ensure the methods of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

A physical inspection of all welding with respect to the tank supports and the piping associated with the new tank installation shall be carried out by the Contractor to ensure that all welds are satisfactory and contain no visible defects or deficiencies.

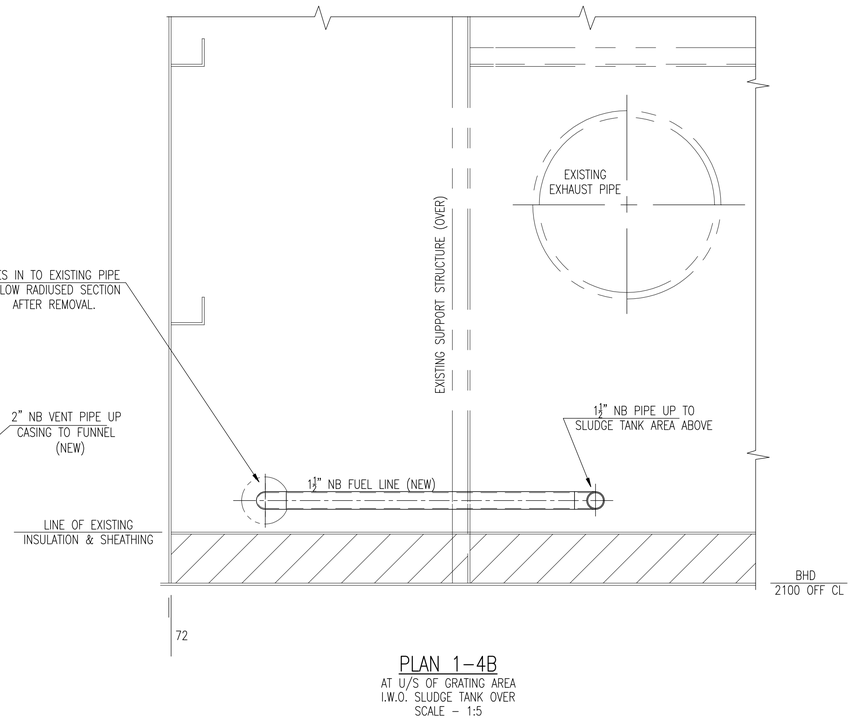
Weld deficiencies shall be recorded, reported and repaired, and then re-inspected and re-tested by the Contractor.

6.3 TRIALS

The sludge tank installation shall be tested and trialled to ensure correct installation and operation as per the tank manufacturer's recommendations.



PLAN 1-7B
ABOVE TOP OF SLUDGE TANK
AT RELOCATED FUEL LINE I.W.O TANK
SCALE - 1:5



PLAN 1-4B
AT U/S OF GRATING AREA
I.W.O. SLUDGE TANK OVER
SCALE - 1:5

REFERENCE PLANS:

No.	Dwg No.	DESCRIPTION

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
2. FRAME SPACING 381mm IN AREA OF TANK.
3. MATERIAL SPECIFICATION:
   VENT PIPING
   PIPE: STEEL ASTM A-53 GR. B SCH.40 GALVANIZED.
   FITTINGS: STEEL BUTT WELD ASTM A-234 GALVANIZED.
   FLANGES: STEEL SLIP-ON ASTM A-105 #150 GALVANIZED
   GASKETS: NITRILE

   FUEL PIPING
   PIPE: STEEL ASTM A-106 GR. B SCH.40
   FITTINGS: STEEL BUTT WELD ASTM A-234
   FLANGES: STEEL SLIP-ON ASTM A-105 #150
   GASKETS: NITRILE
4. ALL PIPING TO BE PROPERLY SUPPORTED USING PIPE CLAMPS WITH WELDED BAR TO STIFFENERS.
5. **ALL DIMENSIONS TO BE CHECKED/VERIFIED AT SHIP PRIOR TO FABRICATION.

Rev	Date	By	Remarks

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Client: CCG/DFO

Title: CCGS 'SIR WILLIAM ALEXANDER'
PIPING MODIFICATIONS TO SUIT
NEW SLUDGE TANK INSTALLATION

Drawn By:	DC	Date:	12/02/15
Checked By:	TN	Scale:	AS NOTED Rev: 0
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Client		J15003-M01	
Class		Sht No: 1 of 2	
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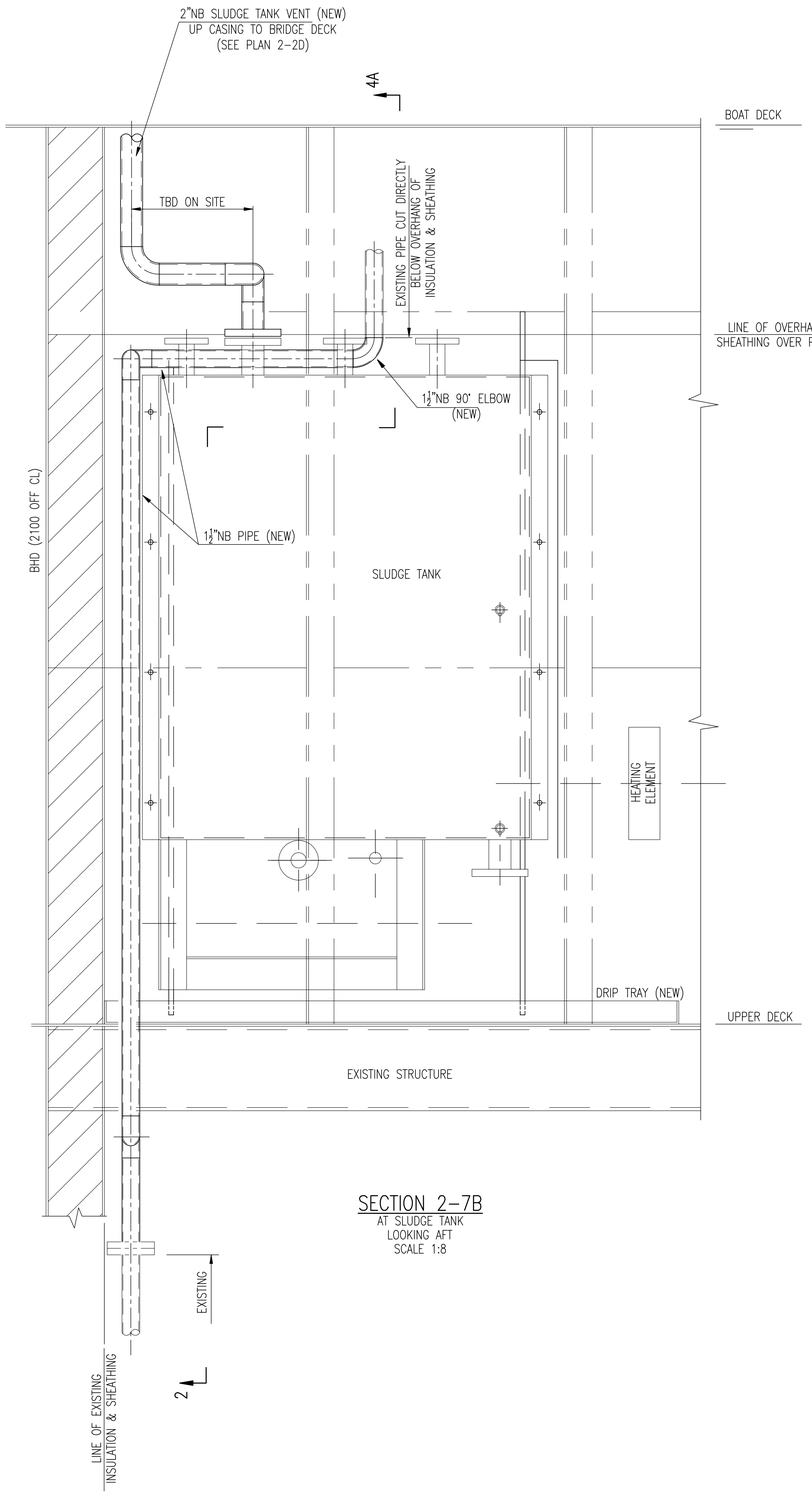
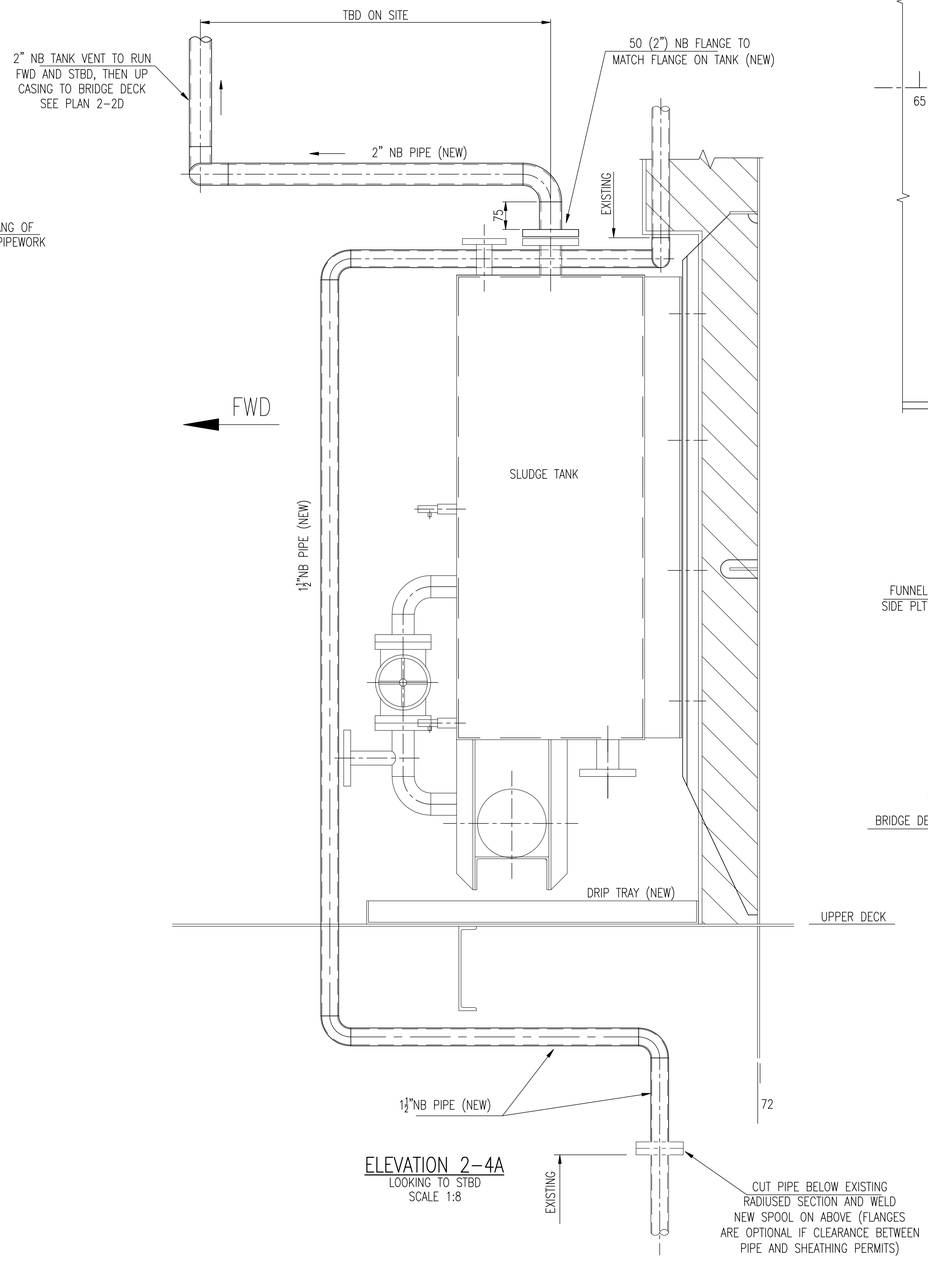
A1 SHT METRIC

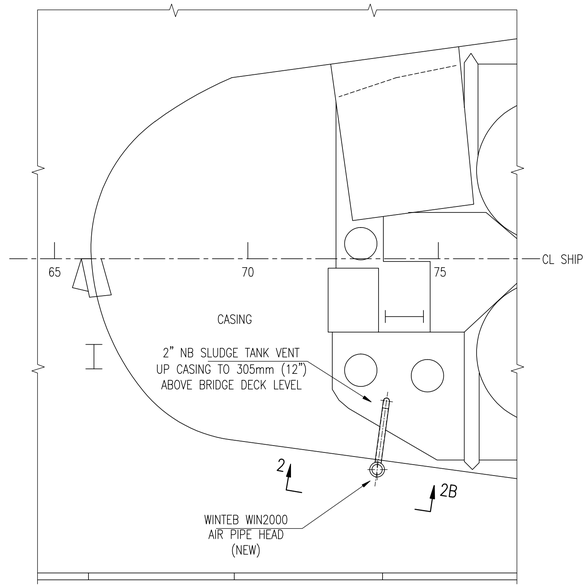
FOR GENERAL NOTES, SEE SHEET 1.



SECTION 2-7B
AT SLUDGE TANK
LOOKING AFT
SCALE 1:8



ELEVATION 2-4A
LOOKING TO STBD
SCALE 1:8



PLAN 2-2D
AT NEW SLUDGE TANK
VENT HEAD LOCATION
ABOVE BRIDGE DECK
SCALE 1:30

ELEVATION 2-2B
AT SLUDGE TANK VENT HEAD
AT BRIDGE DECK LEVEL (STBD)
LOOKING INBOARD
SCALE 1:10

SECTION 2-1B
AT SLUDGE TANK VENT HEAD
LOOKING FWD
SCALE 1:10

Rev	Date	By	Remarks

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Client: CCG/DFO

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PIPING MODIFICATIONS TO SUIT
NEW SLUDGE TANK INSTALLATION

Drawn By: DC		Date: 12/02/15	
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Class		Sht No: 2 of 2	
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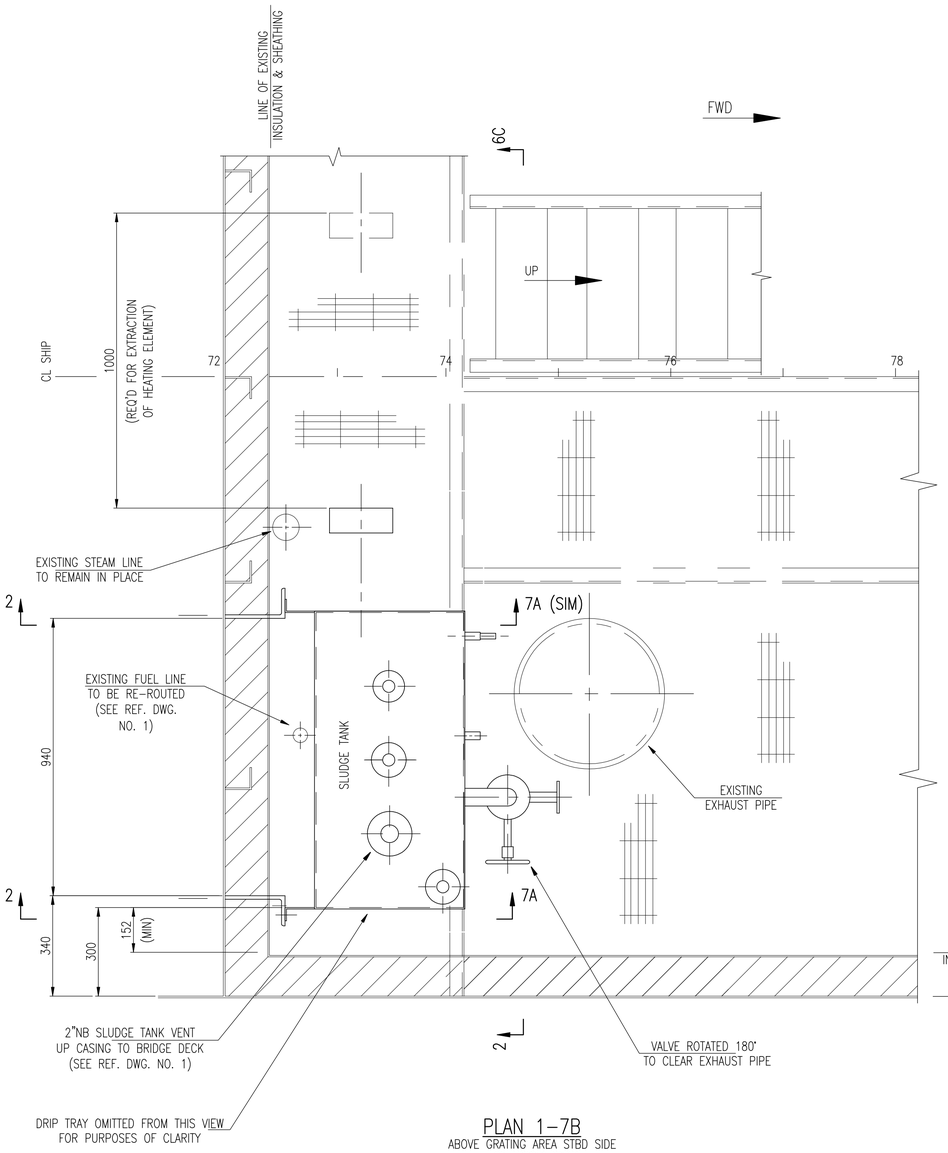
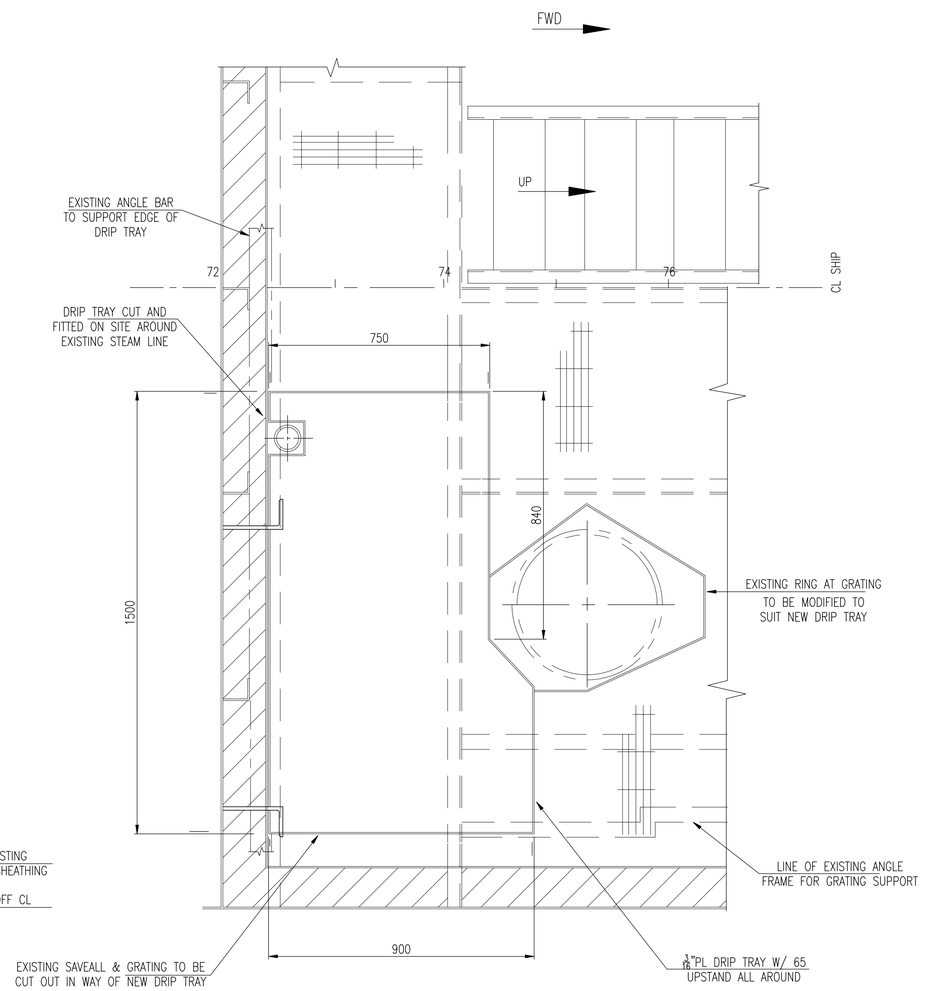


PLAN 1-7B
ABOVE GRATING AREA STBD SIDE
OF UPPER DECK
I.W.O. LOCATION FOR NEW SLUDGE TANK
ALL STRUCTURE EXISTING,
UNLESS NOTED OTHERWISE
SCALE – 1:10



PLAN 1-3B
AT GRATING AREA AT STBD SIDE
OF UPPER DECK
SHOWING LAYOUT OF SLUDGE TANK DRIP TRAY
SCALE – 1:10

REFERENCE PLANS:

No.	Dwg No.	DESCRIPTION
1	J15003-M01	PIPING MODS TO SUIT NEW SLUDGE TK

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
2. FRAME SPACING 381mm IN AREA OF TANK.
3. NEW STEELWORK TO BE MIN. LLOYDS GR. 'A' OR EQUIVALENT, 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.

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A1 SHT METRIC

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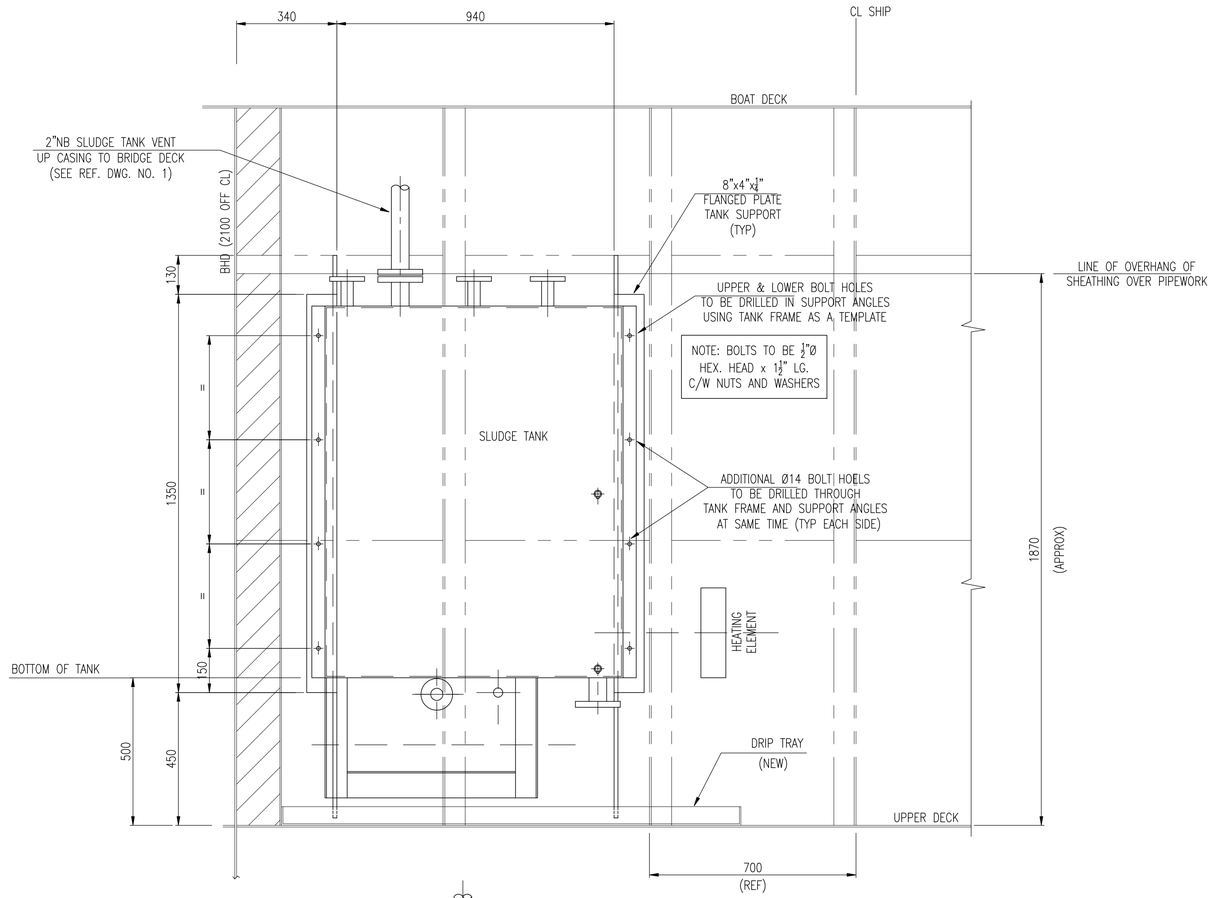
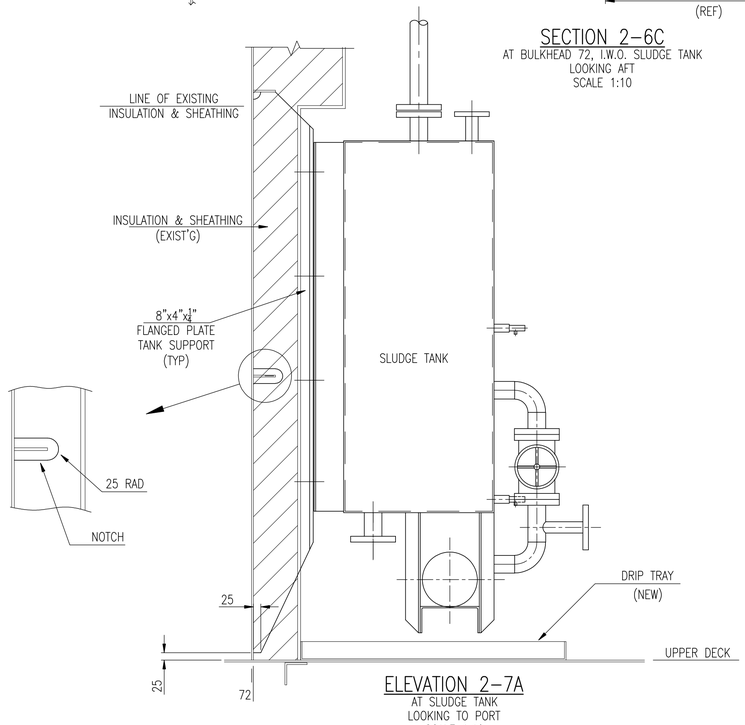


SECTION 2–6C
AT BULKHEAD 72, I.W.O. SLUDGE TANK
LOOKING AFT
SCALE 1:10



ELEVATION 2–7A
AT SLUDGE TANK
LOOKING TO PORT
SCALE 1:10

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