



ADDENDUM 2

މަޢުލޫމާތު Project No:	TES/2015/G-06
މަޢުލޫމާތު Issued Date:	May 06, 2015
މަޢުލޫމާތު Project:	Manufacture and Supply of a landing craft
މަޢުލޫމާތު Deadline for submission:	May 19, 2015, Tuesday at 1100 hours
މަޢުލޫމާތު No. of Pages: - 01	

Please include this amendment when submitting the bid

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- Please find the revised Bidding Data Sheet.

Please be informed that the **bid submission** has been postponed and now will be held on **May 19, 2015, Tuesday at 1100 hours** at Ministry of Finance and Treasury, Tender Evaluation Section

Name: Ahmed Mujuthaba
Signature:



Republic of Maldives

ADDENDUM 02

IFB No.: 027/4427-MAL

Manufacture and Supply of a Landing Craft

Maldives Environmental Management Project (MEMP)

IDA Credit No.: 4427-MAL

May 6, 2015

**Ministry of Environment and Energy
Republic of Maldives**

**Issued by:
Ministry of Finance and Treasury
Male', Republic of Maldives**



Ministry of Finance and Treasury
Male' Republic of Maldives

Maldives Environmental Management Project (MEMP)
IDA Credit No.: 4427-MAL

Manufacture and Supply of a Landing Craft
IFB No.: 027/4427-MAL

Addendum 02

(a) Section II. Bidding Data Sheet (BDS)

ITB Clause Reference	D. Submission and Opening of Bids
ITB 23.2 (c)	<p>The inner and outer envelopes shall bear the following additional identification marks.</p> <p>MANUFACTURE & SUPPLY OF A LANDING CRAFT</p> <p>IFB No.: 027/ 4427-MV</p> <p>MALDIVES ENVIRONMENTAL MANAGEMENT PROJECT</p> <p>and the statement</p> <p>DO NOT OPEN BEFORE MAY 19, 2015 at 1100 hours Male' time</p>
ITB 24.1	<p>For bid submission purposes, the Purchaser's address is:</p> <p>Mr. Ahmed Mujthaba</p> <p>Director General</p> <p>Tender Evaluation Section</p> <p>Public Procurement Division</p> <p>Ministry of Finance and Treasury</p> <p>Ameenee Magu</p> <p>Male', 20379</p> <p>Republic of Maldives</p> <p>Tel: (960) 3349125, (960) 3349106</p>

	<p>Fax: (960) 3320706, (960) 3324432</p> <p>The deadline for the submission of bids is:</p> <p>Date: MAY 19, 2015</p> <p>Time: 1100 hours Male' time</p>
ITB 27.1	<p>The bid opening shall take place at:</p> <p>Tender Evaluation Section Public Procurement Division Ministry of Finance and Treasury Ameenee Magu Male', 20379 Republic of Maldives</p> <p>The bid opening time is:</p> <p>Date: MAY 19, 2015</p> <p>Time: 1100 hours Male' time</p> <p>If the specified bid submission date is declared a holiday for the Purchaser, the bids shall be opened at the next working day at the time and location stated above.</p>
	<p>E. Evaluation and Comparison of Bids</p>
ITB 34.1	<p>Bid prices expressed in different currencies shall be converted in:</p> <p>Maldivian Rufiyaa (MVR).</p> <p>The source of exchange rate shall be:</p> <p>The United Nations Operational Rates of Exchanges.</p> <p>The date for the exchange rate shall be May 11, 2015</p>

(b) Evaluation and Qualification Criteria

1. Domestic Preference (ITB 35.1) Not Applicable

2. Evaluation Criteria (ITB 36.3 (d))

The Purchaser's evaluation of a bid may take into account, in addition to the Bid Price quoted in accordance with ITB Clause 14.6, one or more of the following factors as specified in ITB Sub-Clause 36.3(d) and in BDS referring to ITB 36.3(d), using the following criteria and methodologies.

- (a) Delivery schedule. (As per Incoterms specified in the BDS) **Not Applicable.**
- (b) Deviation in payment schedule. **Not Applicable.**
- (c) Cost of major replacement components, mandatory spare parts, and service.

The list of items and quantities of major assemblies, components, and selected spare parts, likely to be required during the initial period of operation specified in the BDS Sub-Clause 18.3, is in the List of Goods. An adjustment equal to the total cost of these items, at the unit prices quoted in each bid, shall be added to the bid price, for evaluation purposes only.

- (d) Availability in the Purchaser's Country of spare parts and after sales services for equipment offered in the bid.

An adjustment equal to the cost to the Purchaser of establishing the minimum service facilities and parts inventories, as outlined in BDS Sub-Clause 36.3(d), if quoted separately, shall be added to the bid price, for evaluation purposes only.

- (e) Projected operating and maintenance costs during the life of the equipment. **Not Applicable.**
- (f) Performance and productivity of the equipment offered.

IACS classification society approved E grade steel is the minimum required. For evaluation purposes only, the following adjustments will be made;

For IACS classification society approved minimum A grade steel an adjustment of 0% of the Bid Price. For IACS classification society approved minimum B grade steel an adjustment of 5% of the Bid Price. For IACS classification society approved minimum D grade steel an adjustment of 10% of the Bid Price. For IACS classification society approved minimum E grade steel an adjustment of 15% of the Bid Price.

3. Multiple Contracts (ITB 36.6) Not Applicable

4. Post qualification Requirements (ITB 38.2)

After determining the lowest-evaluated bid in accordance with ITB Sub-Clause 37.1, the Purchaser shall carry out the post qualification of the Bidder in accordance with ITB Clause 38, using only the requirements specified. Requirements not included in the text below shall not be used in the evaluation of the Bidder's qualifications.

- (a) Financial Capability

The Bidder shall furnish documentary evidence that it has an average annual Sales turnover of at least MVR 10,000,000 or equivalent, in the last three years to qualify for the award of the contract.

(b) Experience and Technical Capacity

The Bidder shall furnish documentary evidence to demonstrate that it meets the following experience requirement(s):

- (i) During the last five (5) years the bidder must have successfully completed the supply of at least **two (2) numbers** of items comparable to the requirements.
- (ii) **History of Non-performance of a contract did not occur since 1st January 2013.**
- (iii) The bidder shall furnish data to support that it has the financial and production capacity to perform the contract and complete the supplies within the stipulated delivery period. In the case of the bidder not being the manufacturer, this requirement applies to the manufacturer.
 - The Bidder must demonstrate that it will have the personnel for the key positions that meet the following requirements:

Personnel

No.	Position	In Similar Works Experience (Yrs)
1	Naval Architect or equivalent tertiary qualified marine vessel design engineer	5
2	Manufactures construction supervisor/project manager	5

The Bidder shall provide details of the proposed personnel and their experience records in the relevant Forms included in Section IV, Bidding Forms.

- The Bidder must demonstrate that it will have access to the key Contractor's equipment listed hereafter:

Equipment

No.	Equipment Type and Characteristics	Minimum Number required
1	Boatyard and other manufacturing facility compliant with National Boat Building Rules and Guidelines requirements.	1
2	Slip way capable of slipping the vessel to be manufactured.	1

The Bidder shall provide further details of proposed items of equipment using the relevant Form in Section IV.

- Subcontractors/manufacturers for the following major items of supply or services must meet the following minimum criteria, herein listed for that item:

Subcontractors

Item No.	Description of Item	Minimum Criteria to be met
1	Naval Architect or equivalent tertiary qualified marine vessel design engineer	5 years

Failure to comply with this requirement will result in rejection of the subcontractor. In the case of a Bidder who offers to supply and install major items of supply under the contract that the Bidder did not manufacture or otherwise produce, the Bidder shall provide the manufacturer's authorization, using the form provided in Section IV, showing that the Bidder has been duly authorized by the manufacturer or producer of the related plant and equipment or component to supply and install that item in the Employer's country. The Bidder is responsible for ensuring that the manufacturer or producer complies with the minimum criteria listed above for that item.

- (iv) Further, bidder should be in continuous business of supplying, and after sale services of products similar to that specified in this bidding document during the **last three (3) years** prior to bid opening. (Legal status, place of registration and principal place of business of the company or firm or partnership, etc.)
- (v) The documentary evidence of the bidder's eligibility to bid shall establish to the Purchaser's satisfaction that the bidder, at the time of submission of its bid, is from an eligible country as defined under ITB Clause 4.
- (vi) Bidders shall furnish documentary evidence (Client's certificate) in support of the satisfactory services of the goods as specified above.

If the bidder does not meet the above criteria, the purchaser reserves the right to assess the bidder's capabilities and capacity to execute the contract satisfactorily before contract award is decided.

The bidder may be disqualified if they have made misleading or false representations in the forms, statements and attachments submitted in the forms of the qualification requirements and/or records of poor performance such as, not properly completing the contractual obligations, delays in completing the contract, litigation history etc.

Bids from Bidders submitting as authorized representatives of a Manufacturer shall meet the above requirements in full, can also be considered provided:-

- (a) The manufacturer furnishes a legally enforceable authorization in the prescribed Form [Section IV] assuring full guarantee and obligations as per GCC and SCC for the goods offered; and
- (b) The bidder, as authorized agent, has supplied items similar to that of Requirements in any one of the last five (5) years, which must be in satisfactory operation.

(c) EMPLOYERS REQUIREMENTS

Scope of Design, Construction and Supply Services Required by the Client

1. Design

Design, and provide drawings, details and specifications for the construction of a **Landing Craft** to support the waste transfer from islands of Raa, Baa and Lhaviyani atoll under the Maldives Environment Management Project (MEMP). The design drawings, details and specifications for the vessel shall be within local boat building standards and shall have (approx. 30m LOA and approx. 6m beam at amidships) a minimum load carrying capacity (Deadweight) of 120T, manufactured in Steel material. The vessel should meet the standards set out by concerned regulatory authorities.

The Client's Engineer will supervise the vessel throughout the construction stage and approve invoices. For reference purposes the design and construction of the following components shall be in adherence with the standards set out the regulatory authorities and local best practices.

- Hull Structure
- Materials
- Machinery
- Electrical
- Safety (incl. stability etc.)

A complete data set consisting of final draft design drawings, particulars, details, specifications and computations shall be provided to the Client. The dataset shall include but is not necessarily limited to design drawings, particulars, details, specifications and computations in accordance with for Construction of a Landing craft. The data set may include the following:

General

- Vessel profile and concept drawings, scaled elevations, sectional elevations, and cross sections (Aft and Fore, End Area, Midship and Bottom Structure etc. as applicable), and engine/generator bulkhead and other subdivision compartments, deck layout, general arrangement plan.
- Specification of construction materials.
- A Bill of Quantity for estimated cost of vessel manufacture.

Hull

- Main Particulars in meters (Hull Length (LH), Water line Length (LWL), Beam (B), Beam at waterline (BWL), Depth (H), Draught (T), and Freeboard (Fb)).
- Other relevant details such as speed (v) in Knots (Kn) service speed (v0) in m/s, & displacement (D) in tonnes (t).
- Lines plan, off-set table, and typical framing and structural support dimensions and details (scantlings and stiffeners etc.) for hull shell (incl. location and size of any shell openings), deck (incl. hull/deck connections), wheelhouse, cabins, floors, bulkheads, bulwarks, tankage, rudder and steering, engine seating, and other equipment (chain and scissor lift locker etc.).
- Other details relating to the materials of construction such as shell expansion and specification of welded joints.
- Rudder and steering arrangements, details and specifications such as structure of the rudder body, position and specification of rudder bearings, rudder stock and material specification, and rudder bearing seats etc.
- Details of propeller bracket and shaft exits, internal and external ballast, fuel tankage, and other special equipment.

Electrical

- Details of electrical power balance (main and emergency supply).
- A general circuit diagram of the electrical installations showing the basic systems for power generation, energy storage and distribution with output data for generators, storage batteries, users including their fuses and the associated cable types and cross sections.
- Arrangements for lighting and emergency lighting, and main engines electrical starting.
- Electrical drawings for main and emergency switchgear, main distribution board, steering gear drive and control systems, essential equipment installations and control, general alarm systems, and fire detection and alarm systems, and navigation and signaling lights as may be required.

Mechanical

- General layout and arrangement of all shipboard machinery, equipment and appliances, including but not necessarily limited to all essential and essential auxiliary equipment.
- Drawings of parts and installations subject to testing as applicable.

Plumbing

- Plumbing and drainage layout drawings for main and distribution piping for fresh and seawater systems, and wastage (incl. ballast discharge if required), sewage and venting piping for sewerage system.
- General layout and arrangement for toilet, shower, sumps and traps tankage, and bilge and service pumps etc.
- General arrangements for fresh and saltwater, and sewage/greywater and ballast (if required), venting and filling arrangement etc.

Safety

- Preliminary particulars of intact stability for calculation of stability in lightship and different loading conditions.
- General layout and arrangements, details and specifications, of deckwash/firefighting pump, hose diameter and nozzles fire alarms, and extinguishers.

2. Construction

The vessel construction facilities and procedures of the boatyard must meet the requirements of the relevant Rules and Guidelines set out by the concerned regulatory authorities.

The vessel shall be constructed in accordance with drawings and particulars approved by the Client's Engineer with respect to the set out standards and best practices expended in the Boat Building industry.

The workmanship shall be in compliance with current engineering standards and/or local best practices.

Materials, components, appliances and installations subject to inspection and tests shall comply with the relevant rules and regulations and be presented for inspection and/or construction supervision. All tests and trials stipulated by the relevant Construction Rules shall be performed to the satisfaction of the Clients' requirements. Materials, components, appliances and installations found not to be in accordance with National regulatory requirements and Guidelines shall be rectified before the Final Survey or as otherwise requested by the Client's Engineer.

The Contractor shall ensure that any parts and materials requiring approval will only be delivered and installed, if the appropriate test certificates have been issued. Test certificates shall be presented for components requiring approval.

The Contractor shall provide free access during construction stage and workshop for purposes of conducting tests, inspections and surveyors as required by the Client giving prior notice. For performance of the tests required, the Contractor shall give the Client's Engineer assistance by providing the staff and equipment necessary for such tests.

3. Tests and Supply

Shipboard Trials

Upon completion of the vessel but prior to Final Survey and supply to the Client all hull, machinery and electrical installations will be subjected to operational trial including but not necessary limited to the following:

- tightness, operational and load tests of tanks, hatch covers etc.
- operational and/or load tests of the machinery and installations (propulsion, electrical installations, steering gear etc.).
- Other test for safe operations such as tests of navigation equipment, radio communication equipment, and alarms, and black out and dead ships recovery tests.

Sea Trials

Upon completion of the vessel sea trials shall be undertaken for the following or as otherwise required by Client's Engineer:

- Speed trial at 90% Maximum Continuous Rating (MCR)
- Crash stop at 90% MCR
- Endurance at 90% MCR
- Maneuvering trials (turning circles and Z-maneuvers)

Any deficiencies found during the shipboard and sea trials, shall be eliminated prior to final survey and supply as appropriate.

Supply:

The completed Landing craft shall be supplied from the place of manufacture to the Port of Male', Republic of Maldives in a period not exceeding 8 months.

All shipboard trials, sea trials, rectifications and final survey shall have been completed to the satisfaction of Client's Engineer prior to delivery of the vessel to the Client.

The Landing Craft shall be supplied with:

- ***Mandatory spare parts and tools:*** parts and tools which shall be carried on the vessel during voyaging in order to be able to restore engine operation and maneuvering capacity to the vessel in the event of damage at sea as required for safe operations of the vessel. ***Mandatory spare parts and tools are to be supplied with the vessel on delivery. The cost of replacement of mandatory spare parts thereafter will be the responsibility of the Contractor.***
- ***Other spare parts and tools:*** all spare parts and tools offered by Manufacturers/s Suppliers of components and appliances etc. in their standard supply package for the principle component or appliance. ***Other spare parts and tools offered by manufacturers/s suppliers of components and appliances etc. in their standard supply package for the principle component or appliance are to be supplied with the vessel on delivery. The cost of replacement of mandatory spare parts thereafter will be the responsibility of the Contractor.***

All particulars, certifications as required for Assignment of Registration Certificates should be submitted to the Client prior to delivery of the vessel.

Functional Requirements of Landing Craft

The vessel will travel daily from its harbor at the Regional Waste Management Facility (RWMF) and will travel to 4-5 islands on a round trip basis to collect waste and also support logistical requirements necessary such as carrying deck load cargo and diesel oil. The minimum endurance required for this vessel will be about 400nm. The maximum daily steaming time will be maximum 15 hours per day. The load carrying capacity of the vessel shall be between 120 tons and 150 tons with facilities required for necessary lashing.

The vessel shall have dedicated tanks that can accommodate about 50 to 70 tons of Diesel oil as cargo and Ballast tanks to maintain the necessary trim. The maximum height of the load above the deck will not exceed 3.5m. The vessel shall be able to carry lorries with full cargo of waste, excavators and other types of heavy vehicles.

The load carrying area of the vessel shall be approximately 100 to 120m² on the deck. The deck loading is unlikely to exceed 2.5T/m² under normal operating conditions, but additional deck loading may be required for abnormal operating conditions. The load carrying area will be contained within a bulwark or other similar enclosure.

Island harbours and channels are dredged to approximately 3 - 3.5m (MSL), however, access may be reduced over time. The vessel shall have sufficient full load draft to access island harbours and channels of less than 3m depth (MSL). Depending on coastal conditions maintenance dredging may be occur every 2-3 years. The average vessel service speed shall be approximately 10 Knots.

The vessel shall be twin screw and hence the Engine room shall have enough space to accommodate 2 Engines, its gear box and steering arrangement. The Main Engine power rating shall be decided based on the full load displacement of the vessel and the required speed of 10 Knots. The generator capacity shall also be decided based on the operational requirement of the vessel.

The vessel shall be able to carry about 20000 liters of fuel oil and about 10000 liters of fresh water for consumption during operation or an appropriate volume that is required to cover the endurance of 400 nautical miles.

The vessel shall be able to compliment at least 6 crew members including Captain and Chief Engineer and if possible, the accommodation shall have separate cabins for both Captain and the Chief Engineer.

The vessel shall be provided with anchor of about 125 kg with at least one windlass. The sling of windlass shall be at least 50m and the thickness of the anchor chain shall be at least 9mm. A ramp door withstanding the loading of cargo shall be fitted to the vessel. The vessel shall be provided with at least 2 mooring ropes of at least 100m each.

Preliminary particulars of intact stability for calculation of stability in different loading conditions shall be in accordance with the International Code on Intact Stability (2008 IS Code).

The safety equipment and the requirement shall be in accordance with the national regulation enforced by the Maritime Administration of Maldives.

<i>Description</i>	<i>Requirement</i>	<i>Comment</i>
Construction material	Steel	IACS classification society approved minimum E grade steel
Minimum Service speed	10 knots	Steaming at full load

Load required	120T to 150T	
Length	Between 29m to 31m (LOA)	Maintain this range
Beam	Between 6.0m to 6.5m	at amid ships (approximate)
Depth	Between 2.2m to 2.5m	As appropriate
Crew Accommodation	6 Nos	Minimum (Including Captain and Chief Engineer)
Load carrying area (Deck space)	100 to 120m ²	Minimum
Main Engine	2 Units of 300 to 350hp each	Appropriate power for service speed of 10knots
Auxiliary	1 unit of Genset about 15KW and 1 unit of Genset of about 26KW	For electrical lighting and other operations that may required
Gear Box	2 Units of Ratio 1:4	
Oily water separator	1 Unit with flow rate capacity of minimum 0.25 M ³ or a holding tank of about 1m ³	
Endurance	400nm	Minimum
Fuel Storage	20000ltr (for vessel)	Minimum
Fresh water	10000ltr (for vessel)	Minimum
Main electrical system	24VDC	Step down to 12VDC to Wheelhouse as necessary
Heavy Load electrical system	230VAC	Provided from Gen-set
Electrical components	50Hz	-
Freshwater main and distribution system (incl. PVC piping, pump, filling, fittings)	Service to shower, basin etc.	May include toilet flushing as proposed by Bidder
Seawater main and distribution system (incl. pump, HD piping, vented loop, thru hull fittings, hose and nozzles as required).	Service to deck wash/firefighting	May include toilet flushing as proposed by bidder.
Ballast pumping system (incl. piping, tankage and pump)		May be proposed by bidder for safe and efficient operation of vessel for safe and efficient operation of the vessel for different loading conditions.
Drainage/ sewerage discharge system (incl. pumps, sumps, piping thru-hull fittings, vented loop, and venting)	Service from toilet shower room, compartment bilge pumps etc.	May include sewage/greywater tankage as proposed by bidder
Diesel Tankage (incl. filling and venting arrangements)	Capacity approximately 20000 liters	Actual capacity to be determined based on endurance, safe and efficient operation of vessel
Fresh water Tankage	Capacity approximately 10000 liters	Actual capacity to be determined based on the endurance, safe and efficient operation of vessel

Technical Specifications of Landing Craft

The engine shall be a heavy duty (1800RPM) continuous rating revolution diesel engine with complete stern arrangement package, and electric start. The engine will be provided with a smart charging alternator with regulator, heavy duty, lead acid, maintenance free marine start batteries). Engine controls shall be cable driven. The vessel gear reduction ratio shall be calculated to ensure maximum operational efficiency. The exhaust system shall be an above water type, and fixed pitch standard propeller package. The clutch shall be wet hydraulic multi dist. type, the lubrication system shall be a forced lubrication system, the propeller shaft shall be Stainless Steel, the steering shall be a hydraulic steering system with wheel, cylinder, pump pipes, and rudder cylindrical cutlass bearing stock with arm. The propeller shall be bronze. The propeller and rudder blade dimensions shall be calculated to maximize operating efficiency. Engine and generator shall be provided with manufactures all standard meter, indicators and switches etc.

The mechanical equipment will be kept to a minimum. A ballast tank, ballast transfer pump and pipework shall be required to trim the vessel during full load and lightship condition.

The electrical load requirements shall be available onboard the vessel during operation as well as in idle condition. Shore power is generally unavailable in Maldivian islands, and as such the vessels power supply equipment will need to be sufficient to operate equipment for loading and unloading as well as steaming operations. The vessels main power supply will be a 24VDC electrical circuit. A 24V-12V step down transformer *may* be required to supply 12VDC equipment if necessary. The vessel will require continuous power to wheelhouse instrumentation and intermittent power to all other 24VDC light load service equipment and appliances. The engine alternator will recharge the service battery bank(s) when the engine is running. A generator will power high voltage (230v) equipment through a high voltage circuit (such as battery recharge / ballast pump / deck wash / fire pump, and exterior weather proof GPO etc. as *may* be required). The generator shall be supplied with a thru hull exhaust system (either through the engine exhaust or separate as required). A battery charger (230 -24VDC) shall be provided to recharge the service battery bank(s) from the generator. A battery switch to isolate/ transfer power supplies to and from the service battery bank (as required for emergency engine starting etc.). The generator shall be provided with 12V start battery. The alternator, generator output, and service battery bank capacity (Ah) shall be calculated from the power balance for the equipment load to be serviced.

The vessel shall be provided with navigation lights (Red/ Green Stbd and Port side, anchor light, stern light, steaming light), waterproof sealed beam searchlight, air horn and navigation equipment (G.P.S. Navman 5500, DC 10-16V, screen 5"+ equivalent), compass, VHF communication and antenna. The wheelhouse will be equipped with oscillating wall mount fans, ceiling lights, and power outlet sockets. The wheelhouse will be provided with wiper(s) to the windscreen. The engine/generator bulkhead compartment will be provided with lights and power outlet sockets. The engine/generator bulkhead compartment shall have adequate ventilation. Inlet/outlet air blower(s) *may* be required to ventilate the engine/generator bulkhead compartment. Emergency power arrangements must be made available to all essential electrical lighting, and operating units (including engine starting). Hardwired smoke detection alarms shall be provided to engine/generator bulkhead compartment, wheelhouse with bunk accommodation *as required*.

All wiring shall be flame proof, and colour coded etc. as required. All necessary distribution boards, electrical control panels, fuse panels and circuit breakers shall be provided as required for the safe operation of the vessel.

The wheelhouse will be located on the main deck but will be proportioned and positioned to maximize the load carrying capacity of the vessel. The wheelhouse will be fully enclosed with a rear

weatherproof door (with acrylic viewing panel, heavy duty, marine grade stainless steel levers, locks and hinges). The windscreen shall be watertight with tempered, flat panel glass and steel/ anodized aluminum frames. Watertight windows shall be provided to Port and Stbd of wheelhouse as required. The wheelhouse shall be equipped with all necessary equipment required for steering, engine control, navigation etc., appropriate to requirement of the vessel. The vessel wheelhouse shall be provided with helmsmen chair (molded shell with seat and lumber cushion type) internal storage and console for mounting of navigation, switches etc. *as required*. The vessel shall have crash bulkhead with an integral chain locker. Grab rails shall be fitted to the exterior of the wheelhouse on Port and Stbd side to enable safe access around to the chain locker at the fore of the vessel.

The wheel house roof shall be extended at the rear to form a covered annex. The covered annex shall be fitted with integral storages for equipment (tarpaulins, tie down ropes, shovels and brooms etc.), a hand-wash basin and freshwater tap ware for drinking water and hygiene requirements, a weather proof double AC socket to power 230V equipment which may be required from time to time, the saltwater firefighting/deck wash hose connection (hydrant) and the hose reel holder.

Toilet/ shower will be provided in the accommodation of the vessel. The toilet/shower room shall be provided with basin with marine toilet (freshwater flush with macerator and overboard discharge pump), freshwater shower and basin mixer, towel hanger, mirror, and Muslim shower. The bunk accommodation shall be provided with bunks constructed of timber frames and slats with plywood bases or similar within the wheelhouse. The toilet/shower room shall be provided with wooden panel doors and frames with brass butt hinges, and latches as required.

The vessel deck shall be provided with heavy duty schedule 80 steel fairleads, and deck cleats, and deck bollards, and aft rings *as required*. Anchor, anchor rope and chain shall also be provided for as necessary. The underwater hull shall be provided with antifouling (2 coats) and antifouling primer (two coats). Durable, marine grade paint/ shall be applied to all exterior surfaces as necessary. A durable, nonslip, marine grade finish shall be applied to exterior decks, stairs and interior service areas.

An integral staircase will provide access from the wheelhouse to below decks. The engine/generator bulkhead compartment will be accessible thru-decks from the stair case and engine/generator bulkhead door. An emergency escape hatch will be provided from the engine/generator bulkhead compartment to the aft of the main deck.

The vessel will be supplied with adequate fuel, and freshwater tankage. Freshwater tankage for crew requirements (drinking and hygiene) will be approximately 10000 litres. Fuel tankage should be calculated for 15 hours per day steaming, with total fuel tankage capacity calculated the intended endurance which is approximately 400nm. (approximately 20000L total fuel tankage capacity). The total fuel and freshwater tankage (and a separate seawater ballast tank *if required*) capacity shall be calculated according to the overall ballast requirements of the vessel to maximize steaming efficiency. All tankage shall be provided with connection, fill and breather arrangements *as required*. A sewage/greywater holding tank *may* be required.

The pump requirements for the vessel shall be kept to a minimum. PVC fresh and HD seawater main, distribution PIPING and fittings shall be provided as necessary. Self-priming seawater deck wash/ fire pump(s), hose(s), and nozzle(s) shall be provided as necessary. Vented loop, thru hull marine fittings (bronze/brass/teflon) shall be provided for the seawater intake and distribution (and ballast tank arrangements if required) as necessary. A sewage/greywater sump and overboard discharge pump, piping and fittings shall be provided as necessary. A freshwater service pump(s) shall be provided as necessary. Bilge pumps shall be provided to hull and bulkheads *as required*. Bilge pump capacity shall be calculated for the area to be serviced. Deck lockers (chain and scissor lift) shall be drained to the bilge pumps sumps. Deck wash/fire pump, (and ballast pump, and sewage overboard discharge