
	<p align="center">FABRICATION, INSTALLATION OF NEW PONTOON AND REPAIR AND MAINTENANCE OF EXISTING PONTOON FOR RORO/ROPAX FACILITY AT GHOGHA- GUJARAT. SPECIFICATION FOR PUMPS, PIPING, LIFE SAFETY ND FIRE FIGHTING EQUIPMENT</p>	<p>PAGE: 1/ 19</p>
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**FABRICATION, INSTALLATION OF NEW PONTOON AND
REPAIR AND MAINTENANCE OF EXISTING PONTOON FOR
RORO/ROPAX FACILITY AT GHOGHA- GUJARAT.**

(DPA/RORO/2024, Dated:25/07/2024)

PART 3 – TECHNICAL DOCUEMENTS



	<p>FABRICATION, INSTALLATION OF NEW PONTOON AND REPAIR AND MAINTENANCE OF EXISTING PONTOON FOR RORO/ROPAX FACILITY AT GHOGHA- GUJARAT. SPECIFICATION FOR PUMPS, PIPING, LIFE SAFETY ND FIRE FIGHTING EQUIPMENT</p>	<p>PAGE: 2/ 19</p>
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TENDER DOCUMENT

FOR

**FABRICATION, INSTALLATION OF NEW PONTOON
AND REPAIR AND MAINTENANCE OF EXISTING
PONTOON FOR RORO/ROPAX FACILITY AT
GHOGHA- GUJARAT.**

VOLUME V


**SPECIFICATION FOR PUMPS, PIPING, LIFE SAFETY
AND FIRE FIGHTING EQUIPMENT**



**DEENDAYAL PORT AUTHORITY
ADMINISTRATIVE OFFICE BUILDING
POST BOX NO. 50
GANDHIDHAM (KUTCH)**



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Dept. of Ocean Engg., IIT Madras


	<p align="center">FABRICATION, INSTALLATION OF NEW PONTOON AND REPAIR AND MAINTENANCE OF EXISTING PONTOON FOR RORO/ROPAX FACILITY AT GHOGHA- GUJARAT. SPECIFICATION FOR PUMPS, PIPING, LIFE SAFETY ND FIRE FIGHTING EQUIPMENT</p>	<p align="right">PAGE: 3/ 19</p>
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GUJARAT – 370201

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1. CENTIFUGAL PUMPS FOR BALLASTING AND DE-BALLASTING.

1.1. Scope

Providing, Installing, and commissioning Centrifugal Pumps set with accessories for ballasting and de-ballasting having a minimum flow rate of 510 Cu/hr with a pump head of 6 Mtr., Pump power input at duty point of 10.55 KW, Driver motor of 15 KW and rated speed of 1450 RMP.


Note:

- a) Pump should be Kirloskar or equivalent make.
- b) Cost includes all pipeline from pump to all compartments for flooding, de-flooding and air vent pipes including sounding pipes etc. and commissioning of pump for functional test.

1.2. General considerations

- a) The Bidder should submit the detailed technical specification and leaflets of the offered model of Pump along with tender. The specific details such as make and model of the engine, motor & alternator to be supplied against this work shall be indicated in the Technical Bid. Offered model shall meet all the technical parameters specified in the tender.
- b) All Packages should be packed properly to withstand sea transit and legibly marked with paint.
- c) Complete work shall be carried out under the supervision of the Engineer's representative.
- d) All the Pump should be tested and test certificate of all the components such as Engine, motor, Alternator etc. shall be submitted along with commissioning report.
- e) The Pump should be guaranteed for a period of one year from the date of commissioning against manufacturing defects or usage of substandard raw materials. Defects if any found during the Guarantee period should be made good by the contractor on free of cost.
- f) This standard shall be followed in establishing the minimum engineering requirements for centrifugal pumps for non-critical services.
- g) The pumps shall be designed, manufactured and supplied as per the contract.
- h) The pump shall be designed to develop the specified differential head at rated capacity, suction pressure and specific gravity while running at the rated speed. Rated speed of pump shall be full load speed of the drive motor. In case the driver is not in pump vendor's scope, full load speed of the driver shall be furnished to the pump vendor along with other details after order. The pump characteristics shall be guaranteed / tested with reference to the full load speed of motor.




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- i) Guarantee point shall refer to the differential head, rated capacity, specific gravity, and full load speed of the driver.
- j) The pump and accessories shall be suitable for outdoor, unsheltered installation and continuous duty unless otherwise specified in the respective specification sheets.
- k) The pumps shall be supplied complete with all the accessories as specified in the respective specification sheets inclusive of necessary appurtenances, auxiliary piping, special tools, spares etc.
- l) Accessories required / recommended by pump vendor other than those specified in the pump specification sheet for safe and efficient operation of the pump unit shall be included in the pump vendor's scope of supply and the same shall be Identified in the bid separately with adequate justification.
- m) Deviations and/or exceptions to the enquiry specification sheet, enclosures, applicable standards, etc., must be listed for each document, clause wise with proper reason in a separate annexure in the bid. Otherwise, it shall be assumed that all the requirements of the enquiry are acceptable without any reservation and shall be binding to the bidder.
- n) Pumps shall have international system of units (SI) dimensions, comply with applicable ISO standards except for piping connections which shall be as per ANSI/ASME standard.
- o) Reference list of pumps which are in operation for similar service conditions shall be furnished with the offer indicating broad specifications, purchase order number, date, and name & address of user.

1.3. Inspection and Testing

- a) All pumps shall be subjected to inspection by Engineer's representative. Test and inspection plan shall be submitted to the Engineer's representative for approval. The Engineer's representative shall indicate additional test to be witnessed over and above the once specified in the pump specifications.
- b) Engineer's representative shall have free access at all reasonable times to the manufacturer's/vendor's / sub vendor's shops. Vendor shall furnish to the Engineer's representative all necessary information and assistance to verify that the requirements of the order specifications have been met. The vendor shall give 2 weeks' notice regarding readiness of material for inspection to the Engineer's representative.
- c) Acceptance of shop test shall not relieve the vendor of this responsibility in any way.
- d) Engineer's representative shall witness / inspect the following:
- e) Review of material test certificate for casing, impeller, shaft, shaft sleeve, wearing rings etc., and for spare parts.
 - i. Dynamic balancing of impeller as per ISO-1940
 - ii. Hydrostatic test.



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- iii. NPSHR test, when specified.
- iv. Performance test including vibration check.
- v. Disassembly / strip down test.
- vi. Visual inspection and dimensional check.
- f) Manufacturer's standard shall be applied with respect to the tolerances of each dimension.
- g) All casting shall be visually inspected before machining for surface defects and irregularities.
- h) All repairs of defects found on inspection shall be subjected to prior approval of Engineer's representative.


1.4. Performance Test

- a) Performance test of each pump in the manufacturer's shop shall be carried out, unless specified otherwise under the supervision of Engineer's representative.
- b) Pumps shall be operated in shop for a period sufficient to obtain complete test data. Unless otherwise agreed, the test speed shall be the rated speed of the pump.
- c) Test procedure shall be as per Hydraulic Institute Standard.
- d) During performance test, pump shall operate without undue.
- e) heating of bearings, excessive vibration, noise, or other mechanical faults. Such defects if noticed shall be promptly rectified to the satisfaction of the Engineer's representative.
- f) Instrument measurement tolerance shall be as per accuracy.
- g) When operating fluid has viscosity appreciably higher than test
- h) fluid, test values of capacity, head, efficiency, and power input shall be corrected to specified viscosity of operating fluid Hydraulic Institute Standard. Characteristic curves shall be plotted accordingly.

1.5. Site Working and Safety Conditions

- a) The contractor shall provide all huts, stores, tarpaulins, and other covers for the accommodation of his staff, workmen and materials. All materials likely to deteriorate in the open shall be stored under suitable cover. Paved floor area for piping pre-fabrication shall be made available by Contractor to carry out the work at designated place.
- b) The contractor shall advise the Engineer's representative within 15 days of the placement of LOI his space requirement which shall include for office, covered storage, open storage, fabrication space, etc. Depending on availability & requirement, space shall be allotted to the contractor for the duration of this contract. He will not be permitted to make use of any other space without the sanction of the




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Owner. The use of this space shall strictly be made for the execution of this contract only. The sanitary conditions of the ground in or around such structures shall, at all times, be maintained by the contractor in a manner satisfactory to the Engineer's representative.

- c) The security of the contractor's equipment and materials is his own responsibility.
- d) If any material issued to the contractor by the Engineer's representative will remain under the custody of contractor as a trustee. However, title on the same will remain with the Engineer's representative. The contractor will be responsible for loss or damage to such materials and shall preserve them in good working condition as required for the contract and good construction practices till such time that they are incorporated in the works and erected, aligned and fully installed in position and handed over to the owner. In case the Engineer's representative feels that arrangements made by the contractor are not adequate he shall so advise the contractor and the contractor shall promptly take corrective action. In case the contractor fails to take corrective action shall take such corrective actions and recover the cost thereof from the contractor's Bills. Account of such material on completion of work shall be rendered and surplus material returned to the Engineer's representative as per instructions of Engineer's representative.
- e) The contractor shall clear away periodically any rubbish, scrap materials, etc. and dump the same in the area indicated by the Engineer's representative. All construction material shall be neatly stacked in an orderly manner as directed by the Engineer's representative and care shall be taken to allow proper access to workmen and easy movement of men, vehicles, cranes and materials.
- f) The contractor shall maintain all the drawings carefully mounted on the board of appropriate size and well protected from the ravages of weather termites and other insects.
- g) The contractor shall not permit the entry to the site of any person not directly connected/concerned with the work without first having obtained the written permission of Engineer's representative.
- h) The contractor shall submit a list of plant, equipment, tools, tackles, etc. which he will use, to perform the work. The contractor shall submit a list in duplicate of all materials, tools and tackles etc. brought inside the plant site duly signed by Engineer's representative's security staff as per the rules laid by Engineer's representative. These tools, etc. shall not be removed from the site till the completion of job. A gate pass must be obtained from the Engineer's representative to remove from site any plant, machinery, tools, materials, and equipment.
- i) All items such as instructions and other pertinent data regarding erection/commissioning and maintenance should be typed and classified for transmittal in a manner approved by the Engineer's representative.



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- j) All employees of the contractor shall conform to any rules of conduct, etc. established by Failure to also will be sufficient cause for removal of such person from the site.
- k) The contractor will be responsible for providing all plant, tools and tackles, consumables and scaffolding required for the execution of his work as per the best engineering practices.
- l) The receipt, unloading, movement and storage at site of all the contractor's plant, tools and materials is his responsibility.
- m) The receipt, movement & storage of material issued by Engineer's representative also shall be the responsibility of the contractor.

1.6. First Aid

- a) The Contractor may have qualified first aid personnel and ambulance, in case of accidents. The contractor will, however, provide a first aid post for minor injuries to their staff.

1.7. Supervision of Work

- a) The Contractor shall submit to the Engineer's representative a resume of his site supervisors for approval prior to commencement of the work. Once approved, the contractor shall not remove his site supervisors without prior concurrence of the Engineer's representative.
- b) The entire work is to be completed as per the agreed time schedule. The programme of the work in details shall be submitted by the Contractor before commencement of work. The detailed programs prepared by the contractor shall conform to the targets set forth in the time schedule and will be subject to the approval of the Engineer's representative. All the work shall be carried out in such a manner that the work of other agencies at site is not hampered due to any action of the Contractor.


1.8. Inspection

- a) The work of the Contractor shall be always subject to inspection by the Engineer's representative.

1.9. Completion of Work

- a) Before finally leaving site, all the Contractors store, huts, plant, tools and rubbish shall be removed, and the site left clean and tidy. The space allocated by Engineer's representative shall be vacated and handed over to the Engineer's representative.




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1.10. Working and Safety Regulations


- a) The Contractor shall observe all statutory safety and legal requirements regulations issued by Central and State Governments applicable to the work as well as any local regulations applicable to the site issue by the consultant or any other authority.
- b) Particular attention is drawn to the following.
 - (i) In case of accident, the Engineer's representative shall be informed in writing forthwith. The Contractor shall strictly follow regulations laid down by Factory Inspector, Govt. and State authorities in this regard. Any fatal accident may lead to termination of the Contract.
 - (ii) Contractor shall fence his plant, platforms, excavations etc.
 - (iii) Compliance with all electricity regulations.
 - (iv) Compliance with statutory requirements for inspection and test of all lifting appliances and auxiliary lifting gear.
- c) Staircase, doors or gangways shall not be obstructed in any way that will interfere with means of access of escape.
- a) No excavations will be started without the permission of the Engineer's representative, who will inform the Contractor of the position of any pipes or cables known to be buried in the area. All excavations must be effectively always railed off, or completely boarded over properly marked during the hours of darkness by red warning lamps, using Flame proof warning lamps in nonsmoking areas. Debris or material which cannot be immediately removed must be heaped in such a way as to be immediately remove and to leave adequate passageway. Any finds such as relics or antiques coins or fossils etc. shall be promptly handed over to the Engineer's representative.
- b) The contractor will notify the Engineer's representative of his intention to bring on the site any equipment, such as, space heating or welding apparatus or any container holding liquid or gaseous fuel or other substance which might create a hazard. The Engineer's representative will have a right to prohibit the use of such equipment or to prescribe the conditions under which such equipment may be used. The Engineer's representative will have the right to inspect any construction plant, and to forbid its use if in his opinion it is un-suitable or unsafe. No claim arising there from shall be made by the Contractor. The contractor or anyone acting on his instructions will not bring on to the site any radioactive substance or any apparatus using such substances or any X ray apparatus until written permission and direction regarding the use of such equipment has been received from the Engineer's representative.
 - a. The contractor shall be responsible for the safe storage of the radiographic sources or those of his sub-contractors, if any.
- c) The Contractor will meet all requirements, and act on the instructions of the Engineer's representative where it is necessary to operate a permit to work system.



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- d) Where it is necessary to provide and/or store petroleum products or petroleum mixtures and explosive, the contractor shall be responsible for carrying out such provision and/or storage in accordance with the rules and regulation laid down in Petroleum Act 1934, Explosive Act-1948, Petroleum and Carbide of Calcium Manual Published by the Chief Inspector of Explosive of India. All such storage shall have prior approvals of the Consultant/Owner. In case any approval or clearance from Explosive or any statutory authorities is required, the contractor shall be responsible for obtaining the same.
- e) The Contractor shall have his own Fire Fighting Extinguishers and Equipment.
- f) The Contractor shall be responsible for the provision of all safety notices safety equipment including the safety gadgets for his workmen required by both the relevant legislation and such as the Engineer's representative may deem necessary.
- g) Safety belts shall necessarily be used by the persons while working at overhead and heights. All other necessary safety precautions must be taken care by the Contractor.
- h) Contractor shall either employ a safety officer or shall designate one of his employees who will be responsible for implementing safety requirement contained in this document.
- i) Contractor shall use only steel planks and clamps executing scaffolding. Wooden planks and rope shall not be allowed for this purpose.
- j) Contractor shall use fire retardant (asbestos free) cloth to ensure falling of weld spatters down below during above ground welding to ensure safety of electrical cables and personnel and avoiding any fire hazards.



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2. ILLUMINATION SYSTEM

2.1. Scope

This section covers the specifications for the work of illumination on pontoon. The luminaries and other accessories should fulfil the requirements.

The basis for design has been considered to achieve a lux level of 300-400 lux at working plane of 750mm from finished floor level. The fixtures have been assumed to be installed from the pole.

Luminaires shall be well glass type 250W fitted on to 7.5m high pole. Flameproof well glass/linear LED lighting fixtures suitable for use in zone 1/2 & gas group IIA/IIB classified areas complete with LED lamp, LED driver, reflectors, mounting hardware's, clamps & brackets etc. (Light Output i.e., LUMENS of fixture 15000 to 16000 LM and min. 100LM/watt)

2.2. General Requirements

The offered equipment shall be brand new with state of art technology and proven field track record. No prototype equipment shall be offered.


2.3. Power Supply

Unless otherwise specified, all AC lighting fixtures/control gear boxes/junction boxes shall be suitable for 220 - 250 volts, SPN, 50Hz. $\pm 3\%$ power supply.

2.4. Certification

The equipment shall have test certificates issued by recognized independent test house (CMRI/BASEEFA/LCIE/UL/FM or equivalent). All indigenous equipment shall conform to Indian standards and shall be certified by Indian testing agencies. All equipment (indigenous & imported) shall also have valid statutory approvals as applicable for the specified location. All indigenous flameproof equipment shall have valid BIS license and marking as required by statutory authorities,



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2.5. Technical Requirements


2.5.1. Construction

- a) The enclosures of the lighting fixtures, control gear box and junction boxes shall be of cast light metal alloy and shall be free from frictional sparking hazard. The magnesium content in the alloy shall be as per IS-13346. The temperature rise of external surfaces shall be limited to 200°C, unless otherwise specified.
- b) All equipment shall be suitable for use in outdoor open locations and shall have IP-65 degree of protection.
- c) The equipment shall be provided with gaskets made of non-inflammable and self-extinguishing plastic material.
- d) The enclosures shall be treated and prepared for painting with two coats of epoxy paint with final colour shade (Both internal and external) as per Indian standards.
- e) A warning inscription "Isolate power supply elsewhere before opening" shall be provided on each enclosure". The warning inscription shall be embossed on the enclosure or a separate warning plate with above inscription shall be fixed to the enclosure with screws. The warning plate shall be of nickel plated brass or stainless steel.
- f) All accessories like nuts, bolts, washers etc. shall be made of stainless steel SS-304, whereas the clamps and supporting brackets shall be hot dip galvanized steel. The thickness of galvanising shall be 610gms/m².
- g) All equipment shall be provided with an independent earth terminal with lug inside the enclosure for terminating the third (earth) core of the cable and shall have facility for looping.
- h) A nameplate shall be provided to indicate the details of testing agency (CMRI or equivalent), test certificate no. with date, statutory approval no. with date and agency (CCE/DGFASLI/DGMS), BIS license number and date, applicable gas group etc. The nameplates shall be engraved on 3 ply black white black lamicold sheets using square cutters. Black engraved perspex sheet nameplate shall also be acceptable. Nameplates shall be fixed by screws and shall not be pasted. In case the details given above are embossed on the enclosures, the same need not be repeated on the name plate.
- i) All the flame proof lighting fixtures shall be of LM6 type.

2.5.2. Lighting Fixtures

- a) The construction of lighting fixture shall be such that replacement of lamp, or any normal maintenance of fixture shall not affect their suitability for use in classified area.
- b) Glass used for lighting fixture shall be clear suitable for use under conditions



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involving exceptional risk of mechanical damage.

- c) Well glass lighting fixture flood lighting fixtures shall be suitable for use in hazardous conditions Zone-1 classified area. Mechanical strength of well glass shall satisfy requirement of relevant Indian standard. All well glass fixtures shall be provided with a protective wire cage having mesh dimensions not exceeding.
- d) 50mm x 70mm. The material of the cage shall be galvanised steel or epoxy powder coated mild steel.
- e) The fixing parts of the enclosure which is to be opened for replacement of bulb shall be so fastened that they can be unfastened only with special tools.
- f) The lighting fixtures shall have approved type enclosed break lamp holder and complete enclosure certified as having restricted breathing type construction. In case of lighting fixtures, the holder shall additionally have a spring-loaded lock to hold the lamp in position and to prevent the lamp coming off loose in the holder. Lamp holder shall be Edison screw type.
- g) The lighting fixtures shall have integral control gear box and the lighting fixture to be used with incandescent lamps shall be provided with 2 nos. threaded entries and 2 nos double compression nickel plated brass cable glands. All other lighting fixtures shall be provided with 1 no. threaded entries and 1 no. double compression nickel plated brass cable glands. The glands shall be suitable for the specified cable size. 20 % of the fixtures having double cable entry shall be supplied with 1 no. nickel plated brass plug for sealing unused entry. The plugs shall be supplied loose.
- h) The top of all well glass lighting fixtures shall be identically drilled/threaded to facilitate the installation on pole/column or ceiling.
- i) The flood lighting fixtures shall be supplied with adjustable mounting arrangement both in horizontal and vertical plane.
- j) All lighting fixtures shall be provided with suitable vitreous enamelled or anodised aluminium internal reflector. Additionally, all well glass fixtures shall be provided with an epoxy painted external reflector.


2.5.3. Control Gear Box

- a) Lighting fixtures suitable for discharge lamps shall be provided with power factor correction capacitor, choke starter etc. housed in separate control gear box. The choke shall be copper wound. The complete control gear shall have power factor not less than 0.9.

2.5.4. Junction Boxes

Unless otherwise specified the junction boxes shall be of flameproof construction. All junction boxes for looping of single-phase lighting circuits using cables up to 4mm² shall be



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minimum 80 mm diameter in size. Each junction box shall be complete with requisite number of cable entries and double compression flameproof nickel-plated brass cable gland to suit specified cable size.

2.5.5. Terminals & Wiring

- The fixtures and junction boxes shall be provided with sufficient number of terminals. More than 2 wires per terminal shall not be permitted. If required, additional terminal with shorting link may be used. Unless otherwise specified the terminals for external cable termination shall be suitable for 2.5 mm² solid copper conductor. In case lugs are required for cable termination, tinned copper type lugs shall be provided.
- All internal wiring shall employ 2.5 mm² 660V grade, FRLS PVC insulated copper conductor wires, colour coded for phase, neutral and earth.
- All terminals in equipment shall be of non-sparking and anti-loosening design such that they do not produce any arc or spark during normal operation.

2.6. Specifications for lighting poles

2.6.1. 7.5 meters octagonal pole

Supply, delivery, installation, testing and commissioning of 7.5 meters high hot dip galvanized octagonal poles with top shall be 70mm, bottom 135 mm made up of 3 mm thickness H.T. steel plates having a base plate of size 225x225x12 mm thick with 1000 mm long arm bracket made up of 48.3x3.25 mm thick pipe including EN8 grade foundation bolt with required template.


2.6.2. 5 meters hinged octagonal pole.

Supply, delivery, installation, testing and commissioning of 5 meters high hot dip galvanized octagonal poles with top shall be 90mm, bottom 210 mm made up of 3 mm top/4mm bottom/5 mm counterweight thickness of H.T. steel plates having a base plate of size 300x300x16 mm thick with double arm of 1000 mm long bracket made up of 48.3x3.25mm thick pipe having 90°angel including EN8 grade foundation bolt with required template.

2.6.3. 3 meters octagonal pole

Supply, delivery, installation, testing and commissioning of 3 meters high hot dip galvanized octagonal poles with top shall be 70mm, bottom 135 mm made up of 3 mm thickness of H.T. steel plates having a base plate of size 225x225x12 mm thick with 1000 mm long bracket made up of 48.3x3.25 mm thick pipe including EN8.8 grade foundation bolt with required template.



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3. FIRE AND LIFE SAFETY EQUIPMENT


3.1 First Aid Fire Fighting Equipment

The first aid equipment shall consist of portable fire extinguishers. For extinguishing small fires and for first aid use, it is proposed to have portable fire extinguishers and wheel mounted extinguishers. These portable extinguishers shall be of a pressure type using dry chemical powder. They shall be located on the unloading platform and breasting dolphins and at other strategic points.

3.2 75 kg DCP Fire Extinguisher (ISI Mark)

- a) Made of 6 mm thick M.S. Sheet (B.Q. Plate & design of vessel as per IS:2825) with radiography quality welding. The Extinguisher shall be conforming to IS:10658 (Latest) with ISI Mark duly embossed / punched. The Extinguisher shall be treated with anticorrosive treatment. Nonferrous parts shall be gunmetal. Design calculation of the extinguisher shall be submitted along with the offer.
- b) The hose shall be of minimum 05 metres length and the bursting pressure shall not be less than 50 Kg/cm².
- c) Drain plug of not less than 25 mm diameter to be provided on the body.
- d) The nozzle shall be of Trigger Controlled and capable of discharging powder as per ISI Specification.
- e) Automatically and manually operated Safety Relief Valve to be provided as per IS:10658 (Latest) specification.
- f) Pressure gauge having minimum 50 mm dia. and range from 0 to 42 Kg/cm² to be provided on the body.
- g) The extinguisher to be mounted on robust trolley having two heavy duty bearing fitted rubberised wheels and strong handles for easy mobility.
- h) ISI Marked CO₂ gas cylinder shall be of suitable capacity and shall be approved by Department of Explosives with protector and thermal insulation and to be fitted with ISI Marked wheel type Valve.
- i) Dry Powder with ISI Mark IS:4308 (Latest). The powder shall be packed in plastic rigidex material type bags with heavy duty LD lines duly hermetically sealed. The materials of packing and sealing is to be made in such a way that if the pack is kept inside the water bucket for 24 hours, not a single drop of water will penetrate inside the bag & the characteristics of the powder shall remain unaffected against moisture.
- j) Painting: The paint system offered shall be suitable for marine sea water location. The colour of finish coat shall be of approved shade.



	<p align="center">FABRICATION, INSTALLATION OF NEW PONTOON AND REPAIR AND MAINTENANCE OF EXISTING PONTOON FOR RORO/ROPAX FACILITY AT GHOGHA- GUJARAT. SPECIFICATION FOR PUMPS, PIPING, LIFE SAFETY AND FIRE FIGHTING EQUIPMENT</p>	<p align="right">PAGE: 17/ 19</p>
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- k) As per IS: 2825, Dye penetrated test of the fillet weld of all nozzles and attachment – No discontinuities in the welding.
- l) As per IS: 2825 Radiography (10% covering 50% of "T" Joints) - No discontinuities allowed.
- m) The extinguisher shall be hydro tested at 30 Kg/cm² and shall not develop any leaks at this pressure.
- n) In addition to markings stipulated in IS:10658 (latest) the following permanent punching at the bottom ring is required:
 - i) Manufacturer's name.
 - ii) Year of manufacturing.
 - iii) Manufacturer's serial number.
 - iv) Purchase Order No. and date.
 - v) Inspector Stamp.
 - vi) The date of hydraulic test shall also be marked. Space shall be left for writing the dates of subsequent hydraulic test.
 - vii) Dry Chemical Powder filling height shall be marked on the extinguisher.
- o) Following checks to be carried out:
 - i) Extinguisher is as per IS: 10658 (Latest) with ISI Mark.
 - ii) Design calculation of extinguisher is correct.
 - iii) Design of vessel as per IS: 2825.
 - iv) ISI Marked CO₂ gas cylinder approved by department of explosives.
 - v) Dry Powder is with ISI Mark. The packaging material to be tested as per clause 4.1.1. of IS: 4308/1982. Also, the material of the packing should be as per the specification only. Extinguisher vessel to be hydro tested at 30 kg/sq.cm.


3.3 5kg DCP Fire Extinguisher (ISI Mark)

With ISI Mark-2171 (Latest) complete with initial charge of CO₂ cartridge (200 gms) with ISI Mark-4947 (Latest) and dry chemical powder with ISI Mark-4308 (Latest).

The Fire Extinguisher shall consist of the followings:

- a) Size of filler opening (inner dia.) shall be 63 mm.
- b) Cap shall be of gunmetal / forged brass with chromium plating / black colour.
- c) Hose shall be of braided plastic high pressure with one-meter length with nozzle of ABS Plastic.
- d) All other components, design and performance, anticorrosive treatment shall be as per IS:2171 (latest).
- e) Certification that every extinguisher shall be radiography quality welding and fabrication and design of vessel as per IS:2825, 10% radiography of weld joints



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to be done. Design calculation of the extinguisher shall be submitted along with the offer.

- f) In addition to markings stipulated in IS:2171 (latest) the following permanent punching at the bottom ring is required:
 - i. Manufacturer's name.
 - ii. Year of manufacturing.
 - iii. Manufacturer's serial number.
 - iv. Purchase Order No. and date.
 - v. Inspector Stamp.
 - vi. The date of hydraulic test shall also be marked. Space shall be left for writing the dates of subsequent hydraulic test.
 - vii. Dry Chemical Powder filling height shall be marked on the extinguisher.

3.4 6.8 kg CO2 Fire Extinguisher (ISI Mark)

CO2 type 6.8 Kg. capacity fire extinguisher assembled out of seamless steel cylinder having Explosive (CCE) Approval and ISI Mark (manufactured to IS:2878) complete with ISI marked wheel type valve, one metre length high pressure wires braided discharge hose with horn, mounted on two wheeled rubber tyre trolley and handle. The cylinder shall be fully charged with CO2 Gas. All other components, design and performance, anticorrosive treatment shall be as per IS:2878 latest. In addition to markings stipulated in IS:2878 (latest) the following permanent punching to be provided:

- a) Manufacturer's name.
- b) Year of manufacturing.
- c) Manufacturer's serial number.
- d) Purchase Order No. and date.
- e) Inspector Stamp.

3.5 Life Buoy rings

A lifebuoy ring housing is a case built to contain the flotation device to protect it from damage or deterioration. This can occur from long exposure to high temperatures, ultraviolet rays and even regular splashes from the salty water of the sea. The housing encloses the lifebuoy ring in a safe, weatherproof case to prevent degradation by these elements.

The housing also provides a means of mounting the lifebuoy ring and can come with the ring or purchased separately depending on the manufacturer. It could be a rigid polyurethane cabinet or a PVC fabric bag type of case.



Some are universal and work with a variety of lifebuoy ring sizes and can also be mounted on either post, rail, or wall while others are very specific. Characteristics of a good lifebuoy ring housing cabinet include.

- A quick release system to enable deployment within seconds. It could be a hinged door, zip or another closure system that opens freely and effortlessly.
- Bright orange colour code for enhanced visibility. Yellow and bright red are common too.
- A tamper-proof seal that will alert the user if the device has been opened prior or vandalized.
- Clear and legible instructions of how to open the cabinet and use the lifebuoy ring.

Lifebuoy ring specification

Outer Diam.	Inner Diam.	Buoyancy	Weight	Approval
720mm	450mm	$\geq 142\text{N}$	$\geq 2.5\text{ kgs}$	EC /CCS
720mm	450mm	$\geq 142\text{N}$	$\geq 4.3\text{ kgs}$	EC /CCS

3.6 Life Jacket

The life jacket shall have the following.

Size	: small, medium, large, extra-large, (kids, child, adult)
Colour	: red, orange, yellow, blue, florescent green
Inside material	: soft PE foam
Outside material	: water resistance fabric (Nylon / Polyester)
Fastener	: Heavy duty buckle with belt
Whistle	: SOLAS / IRS approved whistle
Retroreflective tape	: 3 nos. – 6 nos.
Gender	: Unisex
Packaging	: PP bag (10 – 20 Nos)
Usage / Application	: sea patrolling, swimming, deep sea vessels, boating fishing, adventure activity, rafting, water sports.
PFT type	: I, II, III, IV
Model	: MI-200, MI-300, MI-400, MI-C400, MI-500, MI-C500, MI-600, MI-700
Certification	: CE and ISO