

**MORMUGAO PORT AUTHORITY**  
**ENGINEERING MECHANICAL DEPARTMENT**  
**MMS SECTION-BAINA**

Ref. no.CME/XEN(M)/MMS/PUMPS/2023/

Dt. /11/2023

**Sub:** Budgetary Quotation for "Supply, Installation, Testing & Commissioning of new 10 nos. water pumps along with motors, wiring, electrical starter panels and complete foundation including the suction line at various locations at MPA".

Mormugao Port Authority (MPA) is intending to obtain Budgetary Quotation for "Supply, Installation, Testing & Commissioning of new 10 nos. water pumps along with motors, wiring, electrical starter panels and complete foundation including the suction line at various locations at MPA".

The existing pumps and location is attached as ANNEXURE-I. The detailed Scope of work and other salient terms and conditions of the contract are attached at Section-I.

You are kindly requested to submit your Budgetary Offer for the above work as per the format attached at Section-II price Schedule (BILL OF QUANTITIES) BOQ.

Your Budgetary Quotation should reach to this office on or **before 05.12.2023 at 15:30hrs**

Thanking you,

Yours faithfully,

**(Yashpal Singh Negi)**  
**EXECUTIVE ENGINEER(M)**

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## **SECTION-I**

### **TECHNICAL SCOPE OF WORK:**

#### **1. INTRODUCTION**

Mormugao Port Authority (MPA) intends to award the work on turnkey basis for the work of "Supply, Installation, Testing & Commissioning of 10 nos. new water pumps along with motors, wiring, electrical starter panels and complete foundation including the suction line at various locations at MPA".

**1.1** These pumps are mainly used for pumping the water from Sump well located within the vicinity of the Port for drinking, tanker filling, supplying to the tugs and tankers for dust mitigation at roads at B.No.8, 9, 10 & 11 and ADANI/JSW etc.

**1.2** The detail specification and location of the pumps sets are enclosed at **ANNEXURE-I** for reference.

#### **2. DETAILED SCOPE OF WORK.**

##### **MECHANICAL AND CIVIL WORKS**

- a. The existing available 10 nos. pumps, motors, starter panels, coupling and piping installed at various locations at MPA should be dismantled and handed over to the Port in a phased manner in a phased manner as directed by the Ports representative.
- b. Supply of new suitable pumps (10 Nos.) as per the requirement along with suitable motors, starter panels, coupled with pin bush/ tyre coupling and mounted on base frame and equivalent as per specifications at ANNEXURE-I.
- c. Preparation of complete civil foundation for all the new 10 nos. pumps in a phased manner to be replaced including foundation/grouting etc.
- d. Installation of new pumps, motors (prime movers), starter panels and coupling to be carried out in a phased manner as directed by the Port's representative.
- e. The work also includes repairs/replacement of suction pipes line. Contractor shall modify the existing suction/delivery line if required.
- f. The pump set shall include and be fitted with a discharge gauge to ascertain the pressure of flow and Coupling Guard for safety.
- g. The foundation should be sufficiently substantial to absorb any vibration and to form a permanent rigid support for the base plate. (Grade of concrete for foundation to be at least 1:1.5:3 or richer grade, where 1 is Cement: 1.5 Sand: 3 Aggregate).
- h. The foundation of the pumps must be capable of absorbing the forces and torque transmitted to it by the pumps without shifting its position and also withstand forces transmitted by the associated drive and piping connected to the pump.

- i. A combined base plate for these pumps and its drives may be placed on a concrete foundation rest with a special anti-vibration elements to achieve optimal vibration insulation during pumping operation.
- j. Upon completion of complete foundation works as per requirement at site, the supplied new pump assembly frames are to be grouted in line with the existing line of suction and delivery with necessary modifications as required at site in consultation with the Port representative.
- k. The suction and discharge pipes should be supported independently with the help of pipe hangers or support blocks to prevent strain in the pump joints and casing.
- l. After successful replacement of each pump set, alignment of the pump with the motor, suction line and delivery lines, trial run of the pump has to be taken by the contractor for an hour to the satisfaction of the Port representative.

### **ELECTRICAL WORKS**

The detailed scope of work are hereunder for each locations:

#### **1. REPLACEMENT OF 40HP PUMP MOTORS AND DISTRIBUTION PANEL AT OLD POWER HOUSE.**

- a. The work involves dismantling of existing available 3 nos. pumps, motors at Old Power House and same shall be handed over to the Port in a phased manner as directed by the Ports representative. All the existing cables shall be removed and handed over to Engineer in charge.
- b. Removal of existing 03 nos. Star/Delta starters, 03 nos. MCCB's, bus bars DB, 250 Amps MCCB with enclosure, old cables etc., mounted on Bakelite sheet grouted on the wall in a phased manner so as not to hamper water pumping operations. All the existing cables, MCCB, distribution box shall be removed and handed over to Engineer in charge.
- c. Supply, installation, testing and commissioning of new 3nos. 40HP pump motors. The pump motors are to be installed on concrete foundation plinth with nuts and bolts of required size. The foundation shall be constructed as per the frame size of the motor and shall be built by considering civil and mechanical aspects such as water piping and alignment arrangement.
- d. Supply and fixing of cement backer board of thickness 20mm and size suitable for mounting of 1 no 250Amps, 4 MCCB with enclosure, 4 nos. 125A, 4 pole MCB with enclosure, Distribution Box (Bus bar Chamber) and 3 nos. star delta starter. The cement backer board shall be mounted on the wall with proper frame.
- e. Main incoming cable shall be connected to 250 amps MCCB and its output is connected to 04 nos. copper bus bars using suitable size copper cable inside the distribution box(Bus bar Chamber). From bus bar chamber the 4C X 35 sq.mm. flexible copper cable has to be laid individually to 04 nos., 125 amps MCCB,s and from MCCB,s supply is to be given to individual star/delta starters using 3C X 35 sq.mm flexible copper cable. (The required copper cable has to be supply by contractor).

- f. The connections from 125 amps MCCB to their respective Star/Delta starter shall be made using flexible copper cable and connection between the star delta starter panels to their respective motor shall be made using 2 runs of armoured copper cable of size 3C x 35 sq.mm. Cable from starter panel to the motor should be laid along the wall by properly saddling with suitable saddles of GI at every 1 meter interval and laid in GI pipe on the ground.(The required armoured copper cable of size 3C x 35 sq.mm has to be supply by contractor).
- g. All the cables has to be properly laid and terminated using suitable Gland, Lugs, nuts and bolts etc. as per the relevant IS standard. The same has to be supplied by contractor.
- h. Providing Pipe Earthing along with construction of earth pits to 3 nos. 40HP pump motors, panels and fabricated panel base frame. The work includes laying of earthing strips.

### **1.1 TECHNICAL SPECIFICATIONS**

The contractor has to supply 3nos. 40HP of 3 phase induction Pump Motors at Old Power House, Berth no.11 strictly equivalent as per specifications at ANNEXURE-I

#### **II. SUPPLY OF 3 NOS. STAR DELTA STARTERS FOR 40HP PUMP MOTORS.**

Supply of 3 nos. star delta starters panel suitable for 40hp pump motors. The starter shall be incorporated with phase reversal indication relay, overload protection of suitable Ampere rating for 40HP motor, suitable MCB for tripping, LED indications for all 3 phases, Ammeter and Voltmeter.

#### **III. SUPPLY OF MCCBS AND BUSBAR JUNCTION BOX.**

- a. Supply of 1no. 250 Amps 4 pole MCCB and 4 nos 125 Amps 4 pole MCCB. All the 5 nos. MCCB's shall be provided with powder coated MS enclosure having external operating ON/OFF switching and door opening and closing arrangement.
- b. Supply of 1 no. powder coated enclosed Distribution box (Bus Bar Chamber)with 4 nos. of copper bus bars strips of size 30mm width X 6mm thickness along with earth terminal. The bus-bars shall be mounted in JB on the suitable insulators with GI nuts and bolts. It shall be provided with proper insulation and with required size and no. of holes for connections.

#### **IV. INSTALLATION OF STAR DELTA STARTERS, MCCBs AND BUSBAR JUNCTION BOX.**

- a. The 3 nos. star delta starter, Distribution box, 01 no. 250A MCCB with enclosure box and 04 nos. 125 Amps, 4-pole MCCB along with enclosure shall be mounted on cement backer board of suitable size having thickness of 20mm to mount on base frame of suitable size by means of SS nuts and bolts.
- b. The fabricated base frame shall be mounted on wall at a distance of 0.15 m by means of GI fasteners of suitable size and shall be mounted at a height of 1 m from the ground.
- c. The base frame shall be fabricated by using GI angles of size 50mm x 50mm x 5 mm.

- d. The base frame shall be painted with one coat of red oxide and 2 coats of grey finish paint.

## **V MATERIALS TO BE SUPPLIED FOR 40HP PUMP MOTORS AND DISTRIBUTION PANEL AT OLD POWER HOUSE**

1. Supply of 40HP pump motors suitable for supplied pumps	03 nos
2. Supply of 250A, 4 pole MCCB with Powder coated MS enclosure (as per technical specifications).	01 no.
3. Supply of 125 Amps 4 pole MCCB along with MS sheet with Powder Coated enclosure/box (as per technical specifications).	04 nos
4. Supply of fully enclosed Distribution box with copper bus bar (as per technical specifications)..	01 no
5. Supply of star delta starter panels for 40HP pump motors (as per technical specifications)..	03 nos
6. Supply of cement backer board of thickness 20mm and of suitable size for mounting MCCBS, Distribution BOX, starter as detailed above. The cement backer board shall be mounted on the wall with proper GI frame . (as per technical specifications).	01 set
7. Supply of 4C x 70 sq.mm. Copper cable along with necessary glands and lugs for connecting 250 AM MCCB output to distribution box	01 mtr
8. Supply of 4C x 35 sq.mm. flexible Copper cable along with necessary glands and lugs from distribution box connecting to 4 nos125 Amps MCCB-10 mtr	
9. Supply of 3C x 35 sq.mm. flexible Copper cable along with necessary glands and lugs from individual MCCB to starter panel	10 mtrs
10. Supply of 3C x 35 sq.mm armoured copper cable along with necessary glands and lugs from starter panel to motor( 2 runs)	80 mtrs
11. Providing GI pipe Earthing (as per technical specifications).	06 nos
12. Supply of GI Flats of size 25x5mm and GI bolts and nuts for earthing connection along with insulating Sleeve. (as per technical specifications).	200mtr

## **2. REPLACEMENT OF 02NOS 30HP WATER PUMPS ALONG WITH MOTORS, WIRING, ELECTRICAL STARTER PANELS AT JETTY WELL**

- a) The work involves dismantling of existing available 2 nos. pumps, motors at jetty well pump and same shall be handed over to the Port in a phased manner as directed by the Ports representative. All the existing cables shall be removed and handed over to Engineer in charge.
- b) Removal of existing wall mounted main distribution DB along with 02nos. ICTPN and Starters of both the pump motors (prime mover) in a phased manner so as not to hamper water pumping operations.
- c) Supply, installation, testing and commissioning of 2nos. 30HP pump motors. The pump motors are to be installed on concrete foundation plinth with nuts and bolts of required size. The foundation shall be constructed as per the frame size of the motor and shall be built by considering civil and mechanical aspects such as water piping and alignment arrangement.

- d) Main incoming cable shall be connected to 200 amps MCCB and its output is connected to 04 nos. copper bus bars using suitable size copper cable inside the distribution box (Bus bar Chamber). From bus bar chamber the 4C X 25 sqmm flexible copper cable has to be laid individually to 03 nos., 100 amps MCCB,s and from MCCB,s supply is to be given to individual star/delta starters using 3C X 25 sq.mm flexible copper cable. (The required copper cable has to be supply by contractor)
- e) The connections from 100 amps MCCB to their respective Star/Delta starter shall be made using flexible copper cable and connection between the star delta starter panels to their respective motor shall be made using 2 runs of armoured copper cable of size 3C x 25 sq.mm. Cable from starter panel to the motor should be laid along the wall by properly saddling with suitable saddles of GI at every 1 meter interval and laid in GI pipe on the ground.(The required armoured copper cable of size 3C x 25 sq.mm has to be supply by contractor).
- f) All the cables has to be properly laid and terminated using suitable Gland, Lugs, nuts and bolts etc. as per the relevant IS standard. The same has to be supplied by contractor.
- g) Providing Pipe Earthing along with construction of earth pits to both 30HP pump motors, panels and fabricated panel base frame.

## **2.1 TECHNICAL SPECIFICATIONS**

- (i) The contractor has to supply of 2nos. 30HP of 3 phase induction Pump Motors at jetty well pump strictly equivalent as per specifications at ANNEXURE-I.
- (ii) **SUPPLY OF 2 NOS. STAR DELTA STARTERS FOR 30HP PUMP MOTORS.**  
Supply of 2 nos. star delta starters panel suitable for 30hp pump motors. The starter shall be incorporated with phase reversal indication relay, overload protection of suitable Ampere rating for 30HP motor, suitable MCB for tripping, LED indications for all 3 phases, Ammeter and Voltmeter.
- (iii) **SUPPLY OF MCCBS AND BUSBAR JUNCTION BOX.**
  - a) Supply of 1no. 200 Amps 4 pole MCCB and 3 nos 100 Amps 4 pole MCCB. All the 4 nos MCCB's shall be provided with powder coated MS enclosure having external operating ON/OFF switching and door opening and closing arrangement.
  - b) Supply of 1 no. powder coated enclosed Distribution box (Bus Bar Chamber)with 4 nos of copper bus bars strips of size 30mm width X 6mm thickness along with earth terminal. The busbars shall be mounted in JB on the suitable insulators with GI nuts and bolts. It shall be provided with proper insulation and with required size and no. of holes for connections.
- (iv) **INSTALLATION OF STAR DELTA STARTERS, MCCBs AND BUSBAR JUNCTION BOX.**
  - a) The 2 nos. star delta starter, Distribution box, 01 no. 200A MCCB with enclosure box and 03 nos. 100 Amps, 4-pole MCCB along with enclosure shall be mounted on cement backer board., of suitable size having thickness of 20mm to mount on base frame of suitable size by means of SS nuts and bolts.

- b) The fabricated base frame shall be mounted on wall at a distance of 0.15 m by means of GI fasteners of suitable size and shall be mounted at a height of 1 m from the ground.
- c) The base frame shall be fabricated by using GI angles of size 50mm x 50mm x 5 mm.
- d) The base frame shall be painted with one coat of red oxide and 2 coats of grey finish paint.

**V. MATERIALS TO BE SUPPLIED FOR 02NOS 30HP WATER PUMPS ALONG WITH MOTORS, WIRING, ELECTRICAL STARTER PANELS AT JETTY WELL.**

- |   |         |
|---|---------|
| 1. Supply of 30HP pump motors suitable for supplied pumps   | 02 nos  |
| 2. Supply of 200A, 4 pole MCCB with Powder coated MS enclosure (as per technical specifications).   | 01 no   |
| 3. Supply of 100 Amps 4 pole MCCB along with MS sheet with Powder Coated enclosure/box (as per technical specifications).   | 03 nos  |
| 4. Supply of fully enclosed Distribution box with copper bus bar (as per technical specifications)..  | 01 no   |
| 5. Supply of star delta starter panels for 30HP pump motors (as per technical specifications)..   | 02 nos  |
| 6. Supply of cement backer board of thickness 20mm and of suitable size for mounting MCCBS, Distribution BOX, starter as detailed above. The cement backer board shall be mounted on the wall with proper GI frame . (as per technical specifications). | 01 set  |
| 7. Supply of 4C x 50 sq.mm. Copper cable along with necessary glands and lugs for connecting 200 AM MCCB output to distribution box   | 01 mtr  |
| 8. Supply of 4C x 25 sq.mm. flexible Copper cable along with necessary glands and lugs from distribution box connecting to 3 nos 100 Amps MCCB-10 mtr   |         |
| 9. Supply of 3C x 25 sq.mm. flexible Copper cable along with necessary glands and lugs from individual MCCB to starter panel  | 10 mtrs |
| 10. Supply of 3C x 25 sq.mm armoured copper cable along with necessary glands and lugs from starter panel to motor( 2 runs)   | 80 mtrs |
| 11. Providing GI pipe earthing (as per technical specifications).   | 06 nos  |
| 12. Supply of GI Flats of size 25x5mm and GI bolts & nuts for earthing connection along with insulating Sleeve. (as per technical specifications).  | 100mtr  |

**3. REPLACEMENT OF 02NOS. 20HP PUMP MOTORS AND DISTRIBUTION PANEL AT OVER HEAD TANK.**

- a) The work involves dismantling of existing 2nos 20HP pump motors from foundation, 2nos star delta starter panels, main MCCB and distribution MCCBs. The same shall be handed over to Engineer in Charge. However, the removed 2nos motors are to be shifted to Harbour Section.
- b) Supply, installation, testing and commissioning of 2nos 20HP pump motors, 2nos star delta starter panels, main MCCB and distribution MCCBs.
- c) All the existing cables shall be removed and handed over to Engineer in charge.
- d) Supply and installation of 4C x 50 sq.mm. Copper cable of length 0.5m and laying the same from main MCCB of 200A to the busbars.
- e) Supply and installation of 4C x 35 sq.mm. Copper cable of length 0.5m each and laying the same from busbar to each of the distribution MCCB's of 63A. Two separate tapping from busbars to each individual MCCB's shall be taken.

- f) Supply of 4C x 35 sq.mm. Copper cable of length 0.5m each and laying the same from each distribution MCCB of 63A to their respective star delta starter of 20HP pump motor.
- g) Supply of 2 runs of 4C x 35 sq.mm. Copper cables of length 5m for each motor and laying the same from the star delta starter to their respective 20HP pump motor. The total length of cable from starter panel to both the motors required will be approximately 20m. The laid cable along the wall shall be properly dressed with suitable saddles of GI at every 0.5m interval.
- h) Necessary lugs, cable glands, insulators for mounting busbars, nuts and bolts required for execution of the above work shall be supplied as per the requirement and is in the scope of the contractor. The cable shall be glanded properly and terminated at both the ends. One core of the cable shall be used for earthing which shall be connected to body of the enclosures/motors.
- i) Providing Pipe Earthing along with construction of earth pits to both 20HP pump motors and fabricated panel base frame.
- j) The work shall be carried out in a phased manner so as not to hamper water pumping operations.

### **3.1 TECHNICAL SPECIFICATIONS**

- (i) The contractor has to supply supply of 2nos. 20HP of 3 phase induction Pump Motors of overhead tank strictly equivalent as per specifications at ANNEXURE-I.
- (ii) The pump motors are to be installed on concrete foundation plinth with nuts and bolts of required size. The foundation shall be constructed as per the frame size of the motor and shall be built by considering civil and mechanical aspects such as water piping and alignment arrangement.
- (iii) **SUPPLY OF 2 NOS. STAR DELTA STARTERS FOR 20HP PUMP MOTORS.**  
Supply of 2nos. auto Star Delta starter panel suitable for 20HP pump motor. The starter shall be incorporated with phase reversal indication relay, overload protection of suitable Ampere rating for 20HP motor, suitable MCB for tripping, LED indications for all 3 phases, Ammeter and Voltmeter.
- (iv) **SUPPLY OF MCCBS AND BUSBAR JUNCTION BOX.**
  - a) Supply of 1no. 3 pole MCCB of rating 200 Amps for main distribution and 2nos 3 pole MCCB of rating 63 amps for distributing power to each individual 20HP pump motor. All the 3 nos MCCB's shall be provided with powder coated MS enclosure having external operating ON/OFF switching and door opening and closing arrangement.
  - b) Supply of 1 no. powder coated MS junction box of size 0.4m x 0.3m and having a depth of 0.15m equipped with 4nos. copper Busbar strip (i.e. 3 phases and one neutral) of size 25 x 5 mm of length 0.3 m each. The busbars shall be mounted in JB on the suitable insulators with GI nuts and bolts. It shall be provided with proper insulation and with required size and no. of holes for connections.
- (v) **INSTALLATION OF STAR DELTA STARTERS, MCCBs AND BUSBAR JUNCTION BOX.**
  - a) The 2nos star delta starter panel, 3 nos MCCB's enclosures and busbar junction box shall be mounted on cement backer board of suitable size having thickness 20mm to mount on base frame, which in turn shall be mounted on fabricated GI base frame of size 1.3 m x 0.7 m by means of SS nuts and bolts.



- b) The fabricated base frame shall be mounted on wall at a distance of 0.15 m by means of GI fasteners of suitable size and shall be mounted at a height of 1 m from the ground.
- c) The base frame shall be fabricated by using GI angles of size 50mm x 50mm x 5 mm.
- d) The base frame shall be painted with one coat of red oxide and 2 coats of grey finish paint.

(vi) **MATERIALS TO BE SUPPLIED FOR 02NOS, 20HP PUMP MOTORS AND DISTRIBUTION PANEL AT OVER HEAD TANK.**

- |  |         |
|--|---------|
| 1. Supply of 20HP monoblock pump motors  | 02 nos  |
| 2. Supply of star delta starter panels for pump motors (as per technical specifications).  | 02 nos  |
| 3. Supply of 3 pole MCCB of rating 200A along with SS enclosure. (as per technical specifications).  | 01 nos  |
| 4. Supply of powder coated MS enclosure busbar junction box of size 0.4m x 0.3m and depth 0.15m.   | 04 nos. |
| 5. Supply of copper busbar strip of size 25 x 5 mm and of length 0.3m each. . (as per technical specifications).   | 04 nos  |
| 6. Supply of cement backer board 20mm thick to mount starter panels and MCCBs. (as per technical specifications)   | 01 set  |
| 7. Supply of 4C x 50 sq.mm. Copper cable along with necessary glands and lugs. (as per technical specification)  | 02 mtr  |
| 8. Supply of 4C x 35 sq.mm. Copper cable along with necessary glands and lugs. (as per technical specification)  | 22 mtr  |
| 9. Supply of GI pipe Earthing (as per technical specifications).   | 06 nos  |
| 10. Supply of GI Flats of size 25x5mm installed using GI bolts and nuts for Earthing connection along with insulating Sleeve. (as per technical specifications). | 50 mtr  |

**4. REPLACEMENT OF 02NOS. 20HP PUMP MOTORS AND DISTRIBUTION PANEL AT UNDERGROUND TANK.**

- a) The work involves removal of existing 2nos 20HP pump motors from foundation and 2nos star delta starter panels. The same shall be handed over to Engineer in Charge. However, the removed 2nos motors are to be shifted to Baina workshop.
- b) Supply, installation, testing and commissioning of 2nos 20HP pump motors and 2nos star delta starter panels.
- c) Supply of 2 runs of 4C x 35 sq.mm. Copper cables of length 10m for each motor and laying the same from the star delta starter to their respective 20HP pump motor. One core of the cable shall be used for earthing, which shall be connected to body of the enclosures and motors. The total length of cable from starter panel to both the motors required will be approximately 40m. The laid cable along the wall shall be properly dressed with suitable saddles of GI at every 0.5m interval.
- d) Necessary lugs, cable glands, insulators for mounting busbars, nuts and bolts required for execution of the above work shall be in the scope of the contractor. The cable shall glanded properly and terminated at both the ends.
- e) Providing Pipe Earthing to both 20HP pump motors and existing panel.
- f) The work shall be carried out in a phased manner so as not to hamper water pumping operations.

#### 4.1 **TECHNICAL SPECIFICATIONS**

- (i) The contractor has to supply supply of 2nos. 20HP of 3 phase induction Pump Motors of overhead tank strictly equivalent as per specifications at ANNEXURE-I.
- (ii) The pump motors are to be installed on concrete foundation plinth with nuts and bolts of required size. The foundation shall be constructed as per the frame size of the motor and shall be built by considering civil and mechanical aspects such as water piping and aligning arrangement.
- (iii) **SUPPLY AND INSTALLATION OF 2 NOS. STAR DELTA STARTERS FOR 20HP PUMP MOTORS.**
  - a) Supply of 2nos. Star Delta starter panel suitable for each individual 20HP pump motor. The starter shall be incorporated with phase reversal indication relay, overload protection of suitable ampere rating for 20HP motor, suitable MCB for tripping, LED indications for all 3 phases, Ammeter and Voltmeter.
  - b) Both the starter panels shall be mounted on the existing panel board in place of old starter panels.

#### (iv) **MATERIALS TO BE SUPPLIED FOR 02NOS, 20HP PUMP MOTORS AND DISTRIBUTION PANEL AT OVER HEAD TANK.**

- |   |         |
|---|---------|
| 1. Supply of 20HP monoblock pump (as per technical specifications).   | 02 nos  |
| 2. Supply of star delta starter panels for pump (as per technical specifications).  | 02 nos  |
| 3. Supply of 4C x 35 sq.mm. copper cable along with necessary glands and lugs. (as per technical specification).  | 40 mtrs |
| 4. Providing GI pipe Earthing (as per technical specifications).  | 06 nos  |
| 5. Supply of GI Flats of size 25x5mm installed using GI bolts and nuts for Earthing connection along with insulating Sleeve. (as per technical specifications). | 50 mtrs |

#### 5. **REPLACEMENT OF 01NO. 60 HP PUMP MOTORS AT MM**

- (i) The contractor has to supply supply of 01 no. 60HP of 3 phase induction Pump Motors of MM strictly equivalent as per specifications at ANNEXURE-I.
- (ii) Disconnection of existing 02nos 70sq.mm Al armoured cable at both ends and removal of the cable from the existing cable tray. Handing over the cable to the MM division at Baina. The work have to be carried out in a phased manner so as not to hamper water pumping operations.
- (iii) Supply & laying of 2 runs of 3C x 50sq.mm, 1.1kV, PVC insulated & sheathed multistrand copper cable from motor terminal to starter panel along the cable tray. The termination of both cables at both ends using suitable glands and Cu lugs. The cables shall be laid on the existing cable tray clamped using GI clamps for every metre
- (iv) The connection of motor with the existing earthing strip is under contractor's scope.

**Note: Starter panel for MM pump set is not required to be supplied.**

#### 3. **EARTHING FOR ALL THE 10 PUMP SETS**

- I. Pipe Earth electrode Earthing system shall be used to provide earthing and shall conform to IS: 3043 for all the pumps.

II. GI pipe Earthing shall be provided for all pump motors by using 40 mm dia. 2.9 mm thick, 3 meter long GI pipe with GI funnel with mesh and suitable size reducer fixed on the top of the earth electrode. The funnel should be enclosed in a CC chamber of 400 x 400 x 400 mm with a hinged RCC cover. The electrode shall have staggered holes of 12-mm dia. and the electrode should be covered 150 mm around with alternate layers of salt and charcoal from the bottom of the pipe to the bottom of the CC chamber the connection from the electrode is to be established through GI Flats of size 25mmx5mm. Earthing Strips which are installed below the ground should be covered adequately with insulating Sleeve to avoid corrosion. GI strip shall be clamped on wall using GI clamps at an interval for every one meter. Work includes supply & fixing of required GI flats and GI wire for Earthing connection. All materials used for connecting the earth lead with electrode shall be of GI. No earth electrode shall have resistance greater than 3 ohms.

III. The following information shall be displayed with white or yellow paint on the RCC cover.

- a. Earth Pit No.....
- b. Earth resistance.....ohms.
- c. Date of testing.....

#### **4. CONTRACTORS RESPONSIBILITY:**

- a) The Contractor shall Supply, Install, Test & Commission all the new 10nos. water pumps along with motors and complete foundation including the suction line at various location at MPA The contractor has to supply supply of 2nos. 20HP of 3 phase induction Pump Motors of overhead tank strictly equivalent as per specifications at ANNEXURE-I.
- b) The contractor shall supply, install, test and commission all new panels along with required MCCB's, bus bars, etc., cabling as detailed at Electrical works detailed above.
- c) The contractor shall plan to replace the pump sets in a phased manner in consultation with Port representatives so that the pumping operations and water supply to the Port areas are not hampered in any manner.
- d) Contractor shall submit a plan of action of each pump before start/replacement of pump set to the Port representative for approval.
- e) The Contractor shall maintain a register during execution of contract to record the daily progress of work on day to day basis. The progress of work recorded shall be signed jointly by the Contractor and the Port Representative on daily basis.

#### **5. MINIMUM ELIGIBILITY CRITERIA:**

- a) Experience of having successfully completed a similar work during the last 7 years ending last day of month previous to the one in which quotations are invited. In support of this, a Work Order, TDS certificate and satisfactory work completion certificate issued by client shall be submitted.
- b) Similar works means "Supply, Installation, and Testing & Commissioning of water pump sets" at Central Govt. / State Govt. / Port Sector / PSU or any reputed organization.

**6. COMPLETION PERIOD:**

The total work of "Supply, Installation, Testing & Commissioning of new 10 nos. water pumps along with motors, wiring, electrical starter panels and complete foundation including the suction line at various locations at MPA" should be completed **within 270 days from the date of issue of Purchase order.**

The detailed break up is given below:

- i. Supply of all new 10 nos, pumps along with coupled motors and electrical panels and required accessories at MMS section – **90 days from the date of issue of Purchase order.**
- ii. Installation including civil foundation works, testing and successful commissioning of the all the new 10 pump sets - **180 days from the date of handing over of the first site for installation.**

**7. TIME OF ACCEPTANCE**

The supply, installation, testing and successful commissioning of all the new 10 nos., pump sets shall be deemed to have been accepted by the Port after successful trials of the pump sets to the satisfaction of Port's representative.

**8. TRAINING :**

Training shall be provided to the maintenance and operational staff of the system as per OEM recommendations.

**9. GUARANTEE PERIOD:**

The new pump sets installed by the successful contractor shall be guaranteed for 36 months for trouble free operations from the date of successful commissioning and handing over to the Port. The guarantee period shall start from date of acceptance of all the subject pump-sets by the Port. If any defect is observed during the guarantee period, the same shall be replaced/rectified by the Contractor, free of cost under guarantee obligations.

The Contractor shall submit Performance Bank Guarantee of 10% of the Order value, which should be submitted in the form of Bank Guarantee / Demand Draft (in favour of Financial Advisor and Chief Accounts Officer, MPA) within 21 days of receipt of letter of Acceptance of work order which will be refunded upon completion of defect liability period of 03 years from the date of successful commissioning of all the pumps.

**10. MANUAL/ CATALOGUE :**

- a. The contractor shall submit the manual/ catalogue/ Certificate of the pumps and motors (prime mover) to the Port within seven days from the date of supply of the pump sets.
- b. The detailed layout diagram and drawings of the pump sets to be installed is also to be submitted by the contractor before starting the installation/ civil works.

- c. All the drawings of Foundation, catalogues/Brochures of the pump sets and cable layout drawings, Test certificates of pumps and prime mover, routine Test certificates etc. should be submitted by the contractor.
- d. After the completion of the commissioning work of all the subject new pumps to the satisfaction of the Port's Engineer, the drawings of all the pumps at various locations are to be submitted to the Port by the contractor in THREE sets.
- e. The Contractor shall submit the list of insurance spare (recommended spares including electrical spares, if any) of the new pumps supplied which are required to be kept in stock in case of breakdown so as to minimize the downtime.

#### **11. PAYMENT TERMS:**

Payment will be made within 30 days from the date of receipt of undisputed bill, after receipt of supply items / satisfactory testing & commissioning of system. Separate invoices shall be raised towards supply of materials and towards installation, Testing & commissioning of the Pumps.

##### **Following are the stages of Payment:**

- i. 70% (Seventy percent) of order value against receipt of all materials related to the subject work (new 10 Nos. Pumps, Electrical items, Civil items etc.) at site in good condition certified by the Contractor
- ii. Balance 30% (Thirty Percent) of the order value after successful completion of Installation, Testing and commissioning of all the pump sets and handing over to Port.

#### **12. OTHER TERMS AND CONDITIONS :**

- a) Normal working hours are from 08:00 AM to 05:00 PM on Mondays to Fridays and 08:00 AM to 01:00 PM on Saturday. As such the contractor or his representative must obtain written permission to work outside the stated normal working hours at least 24 hours before such work is to be undertaken.
- b) Permission for working beyond the normal working hours of the Port or on Sunday and Public Holidays will be given to the Contractor subject to his agreeing to bear the cost of overtime, if any, which may have to be paid to the Port's supervisory staff.
- c) The contractor shall maintain a register to record the daily progress report of work taken up and shall be jointly signed by the Port's and Contractor representative on daily basis.
- d) The contractor must ensure the safety of labourers engaged by him during the course of execution of work & the Port will not be responsible for any injury sustained by the labourer or for any fatal accident. The Contractor should bear all the loss & expenditure involved. Wherever necessary he should also provide necessary look out men.

- e) The Contractor will be held responsible for any damage to existing structures and surfacing caused by the Contractor during the execution of the contract, the contractor shall repair it to the satisfaction of the Ports representative on conclusion of the Works. For this purpose a joint inspection with the Ports representative may be carried out prior to occupation/handing over the site.
- f) **The contractor may visit the site to determine the full scope of work under this contract and the working conditions before quoting. The contractor should quote the rate by taking into consideration all expenses till the successful trials and handing over of all pump sets to the Port.**
- g) The required tools and tackles including manpower for installation, testing and commissioning of the pump sets required to complete the contract shall be in the scope of the contractor.
- h) All tests shall be carried in presence of the Port representatives, in case of power failure or any other unavoidable circumstances resulting in delay of the work, subsequent day shall be granted.
- i) **Necessary RFID entry passes if required shall be obtained by the Contractor at their own cost with the approval of Port Officials for entry into Port area. The same can be obtained online from our website [www.mptgoa.gov.in](http://www.mptgoa.gov.in).**
- j) The technical scope of works (Section-I) and Price Schedule (Bill of Quantities) at Section II to be read in conjunction to ensure the actual works involved.
- k) Address for communication and submission of bid:

Executive Engineer (M)  
Mechanical Maintenance Section (MMS)/Baina  
Engineering Mechanical Dept.,  
Mormugao Port Authority,  
Baina work shop-Goa – 403802.  
Phone: 0832-2594246.  
Email: [xenm.mpt@gmail.com](mailto:xenm.mpt@gmail.com)

Further amendments if any, visit our website: <https://www.mptgoa.gov.in/>

**EXECUTIVE ENGINEER (M)  
MORMUGAO PORT AUTHORITY**

**ANNEXURE-I****DETAILS OF EXISTING PUMPS AT VARIOUS LOCATIONS TO BE REPLACED**

<b>Location</b>	<b>OLD POWERHOUSE Tank Pump</b>	<b>Jetty well pump</b>	<b>Overhead &amp; Under ground at Headland Reservoir</b>	<b>MM complex</b>
Nos. of pumps required	3	2	4	1
<b>PUMP SIDE</b>				
MAKE	KIRLOSKAR BROTHERS			
DESCRIPTION	Horizontal Split Casing	End Suction Type	MONOBLOCK PUMP	Split Case Pump
PUMP TYPE	DSM - 50/20	DB - 65/20	KDS- 2050+	DSM - 65/20A
TOTAL HEAD (In Meters)		45	45	138-150
DISCHARGE IN	80 M <sup>3</sup> /Hr	80 M <sup>3</sup> /Hr	29 - 18 LPS	80 M <sup>3</sup> /Hr
PUMP INPUT In Kw		19	15/20 HP	
IMP DIA IN (mm)		CI -190	197 mm	
SIZE In MM	50 x 80	65X80	100 X80 MM	80 X 65
SPEED In RPM	1450	2900	2915 RPM	2965
MATERIAL CODE	1	O3	NA CODE	61
Recommended Prime mover rating in (KW)	45	22		45
<b>MOTOR SIDE</b>				
MAKE	KIRLOSKAR			Crompton Greaves
MOTOR TYPE	3 Phase Squirrel cage Induction Motor	3 Phase Squirrel cage Induction Motor	3 phase Induction Motor	3 Phase Squirrel cage Induction Motor
FRAME No.	SC180L	SC 180M		ND225M
OUTPUT In (KW)	22	22	15/20	45 KW/60 HP
SPEED In RPM	1470	2945	2915	2980
VOLTAGE In (Volts)	415	415	415	415 ± 6%
CURRENT IN (Amps)	38	37	29	77
FREQUENCY IN (Hz)	50	50	50	50
STARTER -make/type	MAKE L&T, Star- Delta MN5	Star- Delta	Star- Delta	Star- Delta

**SECTION-II**  
**PRICE SCHEDULE (BILL OF QUANTITIES) BOQ**

**1. SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF 40HP PUMP, MOTORS AND DISTRIBUTION PANEL AT OLD POWER HOUSE**

SR. NO.	DESCRIPTION OF WORK	QTY	UNIT	RATE PER UNIT (RS)	AMOUNT (RS)
1.	Supply of 40 HP pumps as per the required discharge and head mentioned at Annexure-I (as per technical specifications).	3	Nos.		
2.	Supply of 40HP pump motors (as per technical specifications)	3	Nos.		
3.	Supply of 250A, 4 pole MCCB with Powder coated MS enclosure (as per technical specifications).	1	No.		
4.	Supply with Powder coated 125 Amps 4 pole MCCB along with MS sheet enclosure/box (as per technical specifications).	4	Nos.		
5.	Supply of fully enclosed Distribution box with copper bus bar (as per technical specifications)..	1	No.		
6.	Supply of star delta starter panels for 40HP pump motors (as per technical specifications)..	3	Nos.		
7.	Supply and fixing of cement backer board of thickness 20mm and of suitable size for mounting MCCB'S, Distribution BOX, starter as detailed above. The cement backer board shall be mounted on the wall with proper GI frame. (as per technical specifications).	1	LS		
8.	Installation of 3 no star delta starter, Distribution box, 01 no. 250A MCCB with enclosure box and 04 nos., 125 Amps, 4-pole MCCB along with enclosure on cement backer board	1	LS		
9.	Supply and laying of 4C x 70 sq.mm. Copper cable along with necessary glands and lugs for connecting 250 AM MCCB output to distribution box	1	Mtr.		
10.	Supply and laying of 4C x 35 sq.mm. flexible Copper cable along with necessary glands and lugs from distribution box connecting to 4 nos125 Amps MCCB	10	Mtr.		
11.	Supply and laying of 3C x 35 sq.mm. flexible Copper cable along with necessary glands and lugs from individual MCCB to starter panel	10	Mtr.		
12.	Supply and laying of 3C x 35 sq.mm armoured copper cable along with necessary glands and lugs from starter panel to motor( 2 runs)	80	Mtr.		
13.	Providing GI pipe Earthing (as per technical specifications).	6	Nos.		
14.	Supply and installation of GI Flats of size 25x5mm using GI bolts and nuts for Earthing connection along with insulating Sleeve. (as per technical specifications).	200	Mtr.		
15.	Installation including civil works, testing and commissioning of pump at old power house	3	Nos.		
<b>TOTAL (Rs)</b>					
<b>(Rupees _____ only)</b>					



**2. SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF 30HP PUMP, MOTORS AND DISTRIBUTION PANEL AT JETTY WELL**

<b>SR. NO.</b>	<b>DESCRIPTION OF WORK</b>	<b>QTY</b>	<b>UNIT</b>	<b>RATE PER UNIT (RS)</b>	<b>AMOUNT (RS)</b>
1.	Supply of 30HP pumps as per the required discharge and head mentioned at Annexure-I (as per technical specifications).	2	Nos.		
2.	Supply of 30HP pump motors (as per technical specifications)..	2	Nos.		
3.	Supply of 200A, 4 pole MCCB with Powder coated MS enclosure. (as per technical specifications).	1	No.		
4.	Supply of 100 Amps 4 pole MCCB along with powder coated MS sheet enclosure (as per technical specifications).	3	Nos.		
5.	Supply of fully enclosed Distribution box with copper bus bar (as per technical specifications).	1	No.		
6.	Supply of star delta starter panels for 30HP pump motors (as per technical specifications).	2	Nos.		
7.	Supply and fixing of cement backer board of thickness 20mm and of suitable size for mounting MCCBS, Distribution BOX, starter as detailed above. The cement backer board shall be mounted on the wall with proper GI frame. (as per technical specifications).	1	LS		
8.	Installation of 2 no star delta starter, Distribution box, 01 no. 200A MCCB with enclosure box and 03 nos., 100 Amps, 4-pole MCCB along on cement backer board .	1	LS		
9.	Supply and laying of 4C x 50 sq.mm. Copper cable along with necessary glands and lugs for connecting 200 AM MCCB output to distribution box	1	Mtr.		
10.	Supply and laying of 4C x 25 sq.mm. flexible Copper cable along with necessary glands and lugs from distribution box connecting to 4 nos100 Amps MCCB	10	Mtr.		
11.	Supply and laying of 3C x 25 sq.mm. flexible Copper cable along with necessary glands and lugs from individual MCCB to starter panel	10	Mtr.		
12.	Supply and laying of 3C x 25 sq.mm armoured copper cable along with necessary glands and lugs from starter panel to motor( 2 runs)	80	Mtr,		
13.	Providing GI pipe Earthing (as per technical specifications).	4	Nos.		
14.	Supply and installation of GI Flats of size 25x5mm using GI bolts and nuts for Earthing connection along with insulating Sleeve. (as per technical specifications).	100	m		
15.	Installation including civil works , testing and commissioning of pump at Jetty well	02	Nos.		
<b>TOTAL (Rs)</b>					
<b>(Rupees _____ only)</b>					

**3. SUPPLY AND INSTALLATION OF 2 NOS. 20HP MONOBLOCK PUMP MOTORS OF OVER HEAD TANK**

SR. NO.	DESCRIPTION OF WORK	QTY	UNIT	RATE PER UNIT (RS)	AMOUNT (RS)
1.	Supply of 20HP monoblock pump motors for overhead tank (as per technical specifications).	2	Nos.		
2	Supply of star delta starter panels for pump motors at overhead tank (as per technical specifications).	2	Nos.		
3	Installation, testing and commissioning of star delta starter panels for pump motors at overhead tank (as per technical specifications).	2	Nos.		
4	Supply and installation of 3 pole MCCB of rating 200A along with SS enclosure. (as per technical specifications).	1	Nos.		
5	Supply and installation of 3 pole MCCB of rating 63A along with powder coated MS enclosure. (as per technical specifications).	2	Nos.		
6	Supply and installation of powder coated MS enclosure busbar junction box of size 0.4m x 0.3m and depth 0.15m (as per technical specifications).	1	No.		
7	Supply and installation of copper busbar strip of size 25 x 5 mm and of length 0.3m each (as per technical specifications).	4	Nos.		
8	Supply, Fabrication and mounting of base frame along with cement backer board 20mm thick to mount starter panels and MCCBs. (as per technical specifications).	1	No.		
9	Supply and laying of 4C x 50 sq.mm. Copper cable along with necessary glands and lugs. (as per technical specification)	1	Mtr.		
10	Supply and laying of 4C x 35 sq.mm. Copper cable along with necessary glands and lugs. (as per technical specification)	22	Mtr.		
11	Providing GI pipe Earthing (as per technical specifications).	6	Nos.		
12	Supply and installation of GI Flats of size 25x5mm using GI bolts and nuts for Earthing connection along with insulating Sleeve. (as per technical specifications).	50	Mtr.		
13	Installation including civil works , testing and commissioning of pump at overhead Reservoir at headland	02	Nos.		
<b>TOTAL (Rs)</b>					
<b>(Rupees _____ only)</b>					

**4. SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF 20HP MONOBLOCK PUMP MOTORS OF UNDERGROUND TANK.**

SR. NO.	DESCRIPTION OF WORK	QTY	UNIT	RATE PER UNIT (RS)	AMOUNT (RS)
1	Supply of 20HP monoblock pump motors for underground tank (as per technical specifications).	2	Nos.		
2	Supply of star delta starter panels for pump motors at underground tank (as per technical specifications).	2	Nos.		
3	Installation, testing and commissioning of star delta starter panels for pump motors at underground tank (as per technical specifications).	2	Nos.		

4	Supply and laying of 4C x 35 sq.mm. Cooper cable along with necessary glands and lugs. (as per technical specification).	40	Mtr.		
5	Providing GI pipe Earthing (as per technical specifications).	6	Nos.		
6	Supply and installation of GI Flats of size 25x5mm using GI bolts and nuts for Earthing connection along with insulating Sleeve. (as per technical specifications).	50	Mtr.		
7	Installation including civil works, testing and commissioning of pump at underground Reservoir at Headland.	02	Nos.		
<b>TOTAL (Rs)</b>					
<b>(Rupees _____ only)</b>					

**5. SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF 60 HP PUMP, MOTORS OF MM COMPLEX AT BAINA.**

SR. NO.	DESCRIPTION OF WORK	QTY	UNIT	RATE PER UNIT (RS)	AMOUNT (RS)
1	Supply of 60HP pump as per the required discharge and head mentioned at Annexure-I (as per technical specifications).	1	No.		
2.	Supply of 60HP pump motors (as per technical specifications)..	1	No.		
3	Installation including Civil works, testing and commissioning of 60 HP pump at MM Complex (as per technical specifications).	1	No.		
<b>TOTAL (Rs)</b>					
<b>(Rupees _____ only)</b>					

**GRAND TOTAL-( 1+2+3+4+5)= Rs \_\_\_\_\_**

**(RUPEES \_\_\_\_\_ ONLY)**

**The prices quoted is exclusive of GST.**

**Note:**

1. The subject work of replacement of all 10 pumpset at various locations shall be on turnkey basis.
2. The offered rates shall be exclusive of GST.
3. Evaluation will be done on Total rate for Supply, installation and testing of 10 nos. pumps and lowest rate shall be considered among all Bidders.

**Date:**

**Signature & seal of the contractor**