



आईएसओ 9001-2015 पत्तान  
AN ISO 9001-2015 PORT

**MORMUGAO PORT AUTHORITY**  
**ENGINEERING MECHANICAL DEPARTMENT**  
**ELECTRICAL HARBOUR SECTION**

**NOTICE INVITING BUDGETORY OFFERS**

Name of Work	"Replacement of 02 nos. 30meter High Masts at Break water Berth."
Date of submission of budgetary quotation	On or before <b>23/08/2023 at 15:00 Hrs.</b>
Address for communication:	Executive Engineer (E-HR), 2nd floor, Mechanical Engineering Department, Mormugao Port Authority, Admin. Building, Headland sada Vasco-de-Gama Goa - 403804
Contact Details	Phone : (0832) 2594207, 2594577 Email : <a href="mailto:mohamed.shaik@mptgoa.gov.in">mohamed.shaik@mptgoa.gov.in</a>
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**EXECUTIVE ENGINEER (E-HR)**  
**MORMUGAO PORT AUTHORITY**

**Sub: "Replacement of 02 nos. 30 meter High Masts at Break water Berth."**

**Ref:** Budgetary Quotation No. CME/XEN (E-HR)/ 23/ B5

Mormugao Port Authority intends to carry out work of Replacement of 02 nos. 30 meter High Masts at Break water Berth on the existing Civil foundation.

As such, it is requested to kindly furnish budgetary quotation for the same (Scope of work, technical specifications and Price Schedule are enclosed)

Your budgetary quotation should reach to this office on or before 23/08/2023 at 15:00 Hrs.

**Thanking you,**

Yours sincerely,

**EXECUTIVE ENGINEER (E-HR)**

Name of work: "**Replacement of 02 nos. 30 meter High Masts at Break water Berth.**"

### **TECHNICAL SPECIFICATIONS**

#### **Scope of work :**

The proposed job is to be carried out at Mormugao Port Authority (MPA) by replacing 2 numbers of existing 30 meters High Masts lighting towers with new ones on the existing Civil foundation.

#### **I. Brief scope of work**

- a) Supply, Installation Testing and Commissioning of 2 no's High mast on the existing Civil foundation.
- b) Fixing of the LED fittings on the lantern carriage of new High mast and carrying out all necessary wiring works. **Fittings will be provided by MPA.** Other hardware, wiring in the scope of contractor.

#### **II. Details of existing Civil Foundation:**

- a) No of Foundation Bolt: 16 nos.
- b) PCD of foundation Bolt: 740MM
- c) Type: TS 600
- d) Diameter : 30 mm
- e) Length of foundation Bolt: 850 mm Long

**Note:** The Contractor shall inspect the site and get acquainted with the existing civil foundation before offering their quote.

#### **III. Technical Specifications:**

##### **1) High mast height :30 M**

#### **Applicable Standards:**

The following shall be the Reference Standards for the loading of the High masts:

<b><u>Code No.</u></b>	<b><u>Title</u></b>
a). I.S.875 (Part III) 1987.	Code and practice for design loads for structures.
b). BSEN 10025.	Grades of MS. Plates.
c). BS.ISO 1461.	Galvanizing.
e). TR. No.7 2000 of ILE, UK.	Specification for Mast and foundation.

- f) BS: 5135 Welding  
g) IS 4237 General requirements for switchgears and control gears.

#### 1.01 Structure:

The High mast shall be continuously tapered, presenting a good and pleasing appearance and shall be based on proven In-Tension design conforming to the standards referred above, to give assured performance and reliable service. The high mast structure shall be suitable to withstand wind speed of minimum **180 Km/hr** conforming to IS 875 (part III) 1987.

#### 1.02 Construction:

The high mast shall be manufactured using special steel plates, conforming to BS-EN10-025/DIN 17100/BS 4360 or equivalent and shall be delivered in multiple sections of effective length 10 meters. Thus a **30m** mast shall be delivered in 3 sections. At site the sections shall be joined together by slip-stressed-fit method. No site welding or bolted joint shall be done on the mast. The high mast shall withstand wind speed of more than 180 Km/hr

The mast shall be provided with fully penetrated flange, which shall be free from any lamination or incursion. The welded connection of the base flange shall be fully developed to the strength of the entire section. The base flange shall be provided with supplementary gussets between the bolt-holes to ensure elimination of helical stress concentration. For the environmental protection of the mast, the entire fabricated mast shall be hot dip galvanized, internally and externally, having a uniform average thickness of 86 microns to 65 micron as per BSEN-1461/BS ISO1461/IS/2629-1966. Galvanizing shall be done in single dipping method for better adhesion and life. The entire high mast structure shall be PU painted for prevention from Corrosion.

#### 1.02.1 Door Opening:

An adequate door opening shall be provided at the base of the mast. The opening shall be such that it permits clear access to equipment like winches, cables, plug and socket, etc. and also facilitate easy removal of the winch. The door opening shall be complete with a close fitting, vandal resistant, weatherproof door, provided with a heavy-duty double internal lock with special paddle key.

The door opening shall be carefully designed and reinforced with welded steel section so that the mast section at the base shall be unaffected and undue buckling of the cut portion is prevented. Size of door opening shall well suitable to avoid buckling of the mast section under heavy wind conditions.

### 1.03 **Dynamic Loading for the High Mast:**

The High mast structure shall be suitable to sustain an assumed maximum reaction arising from a wind speed of at least 180 Km/hr. confirming to IS 875.

### 1.04 **Lantern Carriage:**

Lantern carriage shall be of 12 arms suitable to mount up to 24 LED fittings

#### 1.04.1 **Fabrication:**

Lantern Carriage shall be provided for fixing and holding the required number of flood light fittings and control gear boxes and should be perfectly self-balanced. The Lantern Carriage shall be fabricated in two halves and joined by bolted flanges with stainless steel bolts and nuts to enable easy installation or removal from the erected mast. The inner lining of the carriage shall be provided with protective PVC arrangement, so that no damage is caused to the surface of the mast during the raising and lowering operation of the carriage. The entire Lantern Carriage shall be **hot dip galvanized** after fabrication.

#### 1.04.2 **Junction Box.**

Weather proof junction box having **IP66** protection made of Cast Aluminum shall be provided on the Carriage Assembly as required from which the inter-connections shall be made to the designed number of the flood light luminaires and associated control gears fixed on the carriage.

#### 1.05.1 **Raising and lowering mechanism:**

For installation and maintenance of the luminaires and accessories it will be necessary to lower and raise the Lantern Carriage Assembly. To enable this, a suitable winch arrangement shall be provided. The winch shall be fixed at the base of the mast and specially designed head frame assembly at the top.

#### 1.05.2 **Winch: Double drum with double gears type**

The winch shall be of completely self-sustaining type, without the need for brake shoe, springs or clutches. Each driving spindle of the winch shall be positively locked when not in use by gravity activated PAWLS. The capacity, operating speed, safe working load, recommended lubrication and serial number of the winch shall be clearly marked on each winch.

The gear ratio of the winch shall be 53:1. However, the minimum working load shall not be less than 750 Kg. The winch shall be self-lubricating type by means of an oil bath. The oil shall be of readily available grades of reputed make.

The winch shall be of double drum grooved to ensure perfect seat for stable and tidy rope lay, with no chances of rope slippage. The rope termination in the winch shall be such that distortion or twisting is eliminated and at least 5 to 6 turns of wire ropes remain on the drum when the lantern carriage is fully lowered and rested on the pads. It should be possible to operate the winch manually by a suitable handle and by an integral power tool. Operation of the winch with manual handle shall be independent of the power tool. Winches with manual operation through the power tool shaft shall not be accepted. Individual drum operation of the winch shall be possible. A double drum winch shall have two drums and two worm gears independent in operation for increased safety. It should be possible to remove the double drum after dismantling through the door opening provided at the base of the mast. Also, a winch gear box for simultaneous and reversible operation of double drum winch shall be provided. Manufacturer Test certificates shall be submitted along with the winch.

#### 1.05.3 **Head Frame:** (with top canopy)

The head frame which is to be designed as a capping unit of the mast, shall be of welded steel construction, galvanized both internally and externally after assembly. The top pulley shall be of appropriate diameter, large enough to accommodate the stainless steel wire ropes and the multi-core electric cable. The pulley block shall be made of non-corrosive material, and shall be of die cast Aluminum Alloy (LM-6). Pulley made of synthetic materials such as Plastic or PVC are not acceptable. Self-lubricating bearings and stainless steel shaft shall be provided to facilitate smooth and maintenance free operation for a long period. The pulley assembly shall be fully protected by a canopy galvanized internally and externally.

Close fitting guides and sleeves shall be provided to ensure that the ropes and cables do not dislodge from their respective positions in the grooves. The head frame shall be provided with guides and stops with PVC buffer for docking the lantern carriage.

#### 1.05.4 **Stainless Steel Wire Ropes:**

The suspension system shall essentially be without any intermediate joint and shall consist of only non-corrosive stainless steel of AISI 316 grade or better grade.

The stainless steel wire ropes shall be of 7/19 construction, the central core being of the same material. The overall diameter of the rope shall not be less than 6 mm. The breaking load of each rope shall not be less than 2350 kg, giving a factor of safety of over 5 for the system at full load. The end constructions of ropes to the winch drum shall be fitted with talugrip. The thimbles shall be secured on ropes by compression splices. Two continuous lengths of stainless steel wire ropes shall be used in the system and no intermediate joints are acceptable in view of the required safety. **No intermediate joints/terminations, either bolted or else, shall be provided on the**

**wire ropes between winch and lantern carriage.** Manufacturer certificate for the rope to be produced.

#### 1.06 **Electrical System, Cable and Cable Connections:**

A suitable terminal box shall be provided as part of the contract at the base compartment of the high mast for terminating the incoming cable. The electrical connections from the bottom to the top shall be made by special **trailing cable**. The cable shall be minimum size 5 core x 4 sq mm copper EPR insulated and PCP sheathed to get flexibility and endurance with **Rodent proof coating**. The cable shall be of reputed make. At the top there shall be weather proof junction box to terminate the trailing cable. Connections from the top junction box to the individual luminaires shall be made by using 3 core x 2.5 sq. mm flexible PVC copper cables of reputed make. The system shall have in-built facilities for testing the luminaries while in lowered position.

Also, suitable provision shall be made at the base compartment of the mast to facilitate the operation of internally mounted, electrically operated power tool for raising and lowering of the lantern carriage assembly. The trailing cables of the lantern carriage rings shall be terminated by means of specially designed, metal clad, multi-pin plug and socket provided in the base compartment to enable easy disconnection when required. The costs of copper cable, cable connections, terminations must be included in the High mast quoted price itself and no separate item/quantity is considered.

##### 1.06.01 **Cable from control panel to High Mast**

The existing cable shall be used from the control panel for High Mast lighting load and motor.

#### 1.07 **Power Tool for the Winch:**

A suitable, high-powered, electrically driven, internally mounted power tool, with manual over ride shall be supplied for the raising and lowering of the lantern carriage for maintenance purposes. The speed of the power tool shall be to suit the system. The power tool shall be single speed, provided with a motor of the required rating. The power tool shall be supplied complete with suitable control. The capacity and speed of the electric motor used in the power tool shall be suitable for lifting of the design load installed on the lantern carriage.

The power tool mounting shall be so designed that it will not only be self-supporting but also aligning the power tool perfectly with respect to the winch spindle during the operations. Also, a handle for the manual operation of the winches in case of problems with the electrically operated tool, shall be provided and shall incorporate a torque limiting device. The power tool operation shall always be through a separate

torque-limiting device to protect the wire ropes from over stretching. It shall be mechanical with suitable load adjusting device. The torque limiters shall trip the load when it exceeds the adjusted limits. There shall be suitable provision for warning the operator once the load is tripped off. The torque limiter is a requirement as per the relevant standards in view of the overall safety of the system. Each mast shall have its own power tool motor.

#### 1.08 Lightning Finial:

One number heavy duty hot dip galvanized lighting finial shall be provided for each mast. The lightning finial shall be minimum 1.2 M in length and shall be provided at the center of the head frame. It shall be bolted solidly to the head frame to get a direct conducting path to the earth through the mast. **The lightning finial shall not be provided on the lantern carriage under any circumstances in view of safety of the system.**

#### 1.09 Aviation Obstruction Lights:

Suitable Aviation Obstruction Lights of reliable design and reputed manufacturer shall be provided on top of each mast. The aviation fitting shall be Heavy duty & whether proof suitable for housing two nos. LED lamps. The Omni directional red colour light shall be pre-wired up to the terminal block. The unbreakable red coloured polycarbonate dome shall be provided and secured to housing. The Aviation obstruction light shall be of Degree protection: IP 66 and Electrical safety-Class-I. Threaded stem with lock nuts for mounting on the pipe above the high mast structure to be provided.

### 2) Control Panel (Feeder panel)

The existing control panel shall be used.

### 3) LUMINAIRES

Each High mast shall fitted with 12 no's LED FLOOD LIGHT FITTINGS on the lantern carriage with complete wiring works. **Fittings will be provided by MPA.**

### 4) ALLIED ELECTRICAL WORKS:

- a) All allied Electrical works as per the Bill of Quantities have to be carried out by the Contractor in all respects invariably mentioned or not mentioned in the specification so as to complete the work in all respects.
- b) The materials required / intended for the work should be handled carefully and neatly installed / laid / commissioned and any damages during installation will be on Contractors account and same shall be rectified immediately to its original condition.



- c) The Miscellaneous works have to be carried out invariably, whether clearly mentioned or not in the specifications and BOQ. The works should be completed in all respects as required for the said project work.

**5) GENERAL NOTES:**

All the drawings of Structural design, catalogues/Brochures of High Mast, type Test certificates, routine Test certificates etc. should be submitted by the contractor in THREE sets invariably mentioned or not in the Tender Schedule.

All the Hardware materials/Miscellaneous materials should be galvanized and conform to IS and Specification and got approved by the Engineer-in-charge before installation and commissioning.

The High Mast offered shall be tendered for inspection at the manufacturer's works before dispatch. Routine Test certificate of High Mast shall be furnished. Other items shall be inspected at site as per the requirement.

**6) GUARANTEE PERIOD:**

- a. The High mast shall be guaranteed for a period of 5 (five) years for all the materials and works carried out by the contractor from the date of commissioning and satisfactory handing over. The Contractor shall be solely responsible for any defects that may develop under the guarantee period and shall at his own cost rectify such defects when called upon to do so by the Engineer.
- b. If any defects are not rectified within 7 days, the Port may proceed to do the work at the Contractors' risk and expenses but without prejudice to any other rights, which the Port may have against the Contractor in respect of such defects.

**7) Qualification Criteria :**

The Bidder shall have successfully carried out work of Supply, Installation, Testing and Commissioning of High mast during last 7 (Seven) years ending last day of month previous to the one in which quotations are invited for Central Govt. / State Govt. / Port Sector / PSU or any reputed organization.

**8) COMPLETION PERIOD:**

All the jobs as per contract, have to be completed within 4 Months from the date of issue of letter of acceptance.



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**PRICE SCHEDULE (BILL OF QUANTITIES – BOQ)**

Name of work: "Replacement of 02 nos. 30 meter High Masts at Break water Berth."

S.N	Item Description	UNIT	Qty	Rate Per Unit (Rs)		Applicable GST %	Amount (Rs.)
				In Fig	In words		
01	Supply of 30 mtr. High mast lighting tower with all accessories as per the technical specifications.	set	2				
02	Installation, testing and commissioning of 30 mtrs. High mast complete in all respect with the help of suitable equipment's.	No.	2				
03	Fixing of LED flood light luminaries Fittings including wiring complete in all respect. <b>Fittings will be provided by MPA</b>	No.	24				
<b>Total</b>							

(In Words Rupees \_\_\_\_\_ only)

**NOTE:**

- 1.The rates quoted shall be inclusive of duties, transportation, lodging and boarding, but excusive of GST. Applicable GST shall be paid extra as applicable.