

MORMUGAO PORT AUTHORITY
ENGINEERING MECHANICAL DEPARTMENT
ELECTRICAL HARBOUR SECTION

NOTICE INVITING BUDGETORY OFFERS

Name of Work	“Third party inspection (TPI) agency for carrying out the inspection and certification of 7 nos 30 mtr. High mast lighting tower and its accessories as per the Technical specifications at manufacturers work site and approving the foundation design and certifying foundation casting works at MPA site
Date of submission of budgetary quotation	On or Before 26/10/2022 at 15:00 Hrs.
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 : mohamed.shaik@mptgoa.gov.in
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EXECUTIVE ENGINEER (E-HR)
MORMUGAO PORT AUTHORITY

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Sub: Third party inspection (TPI) agency for carrying out the inspection and certification of 7 nos 30 mtr. High mast lighting tower and its accessories as per the Technical specifications at manufacturers work site and approving the foundation design and certifying foundation casting works at MPA site

Ref: Budgetary Quotation No. CME/XEN (E-HR)/ H-1/22/B2

Mormugao Port Authority, intends to engage third party inspection (TPI) agency for carrying out the inspection and certification of 7 nos 30 mtr. High mast lighting tower and its accessories as per the Technical specifications at manufacturers work site and approving the foundation design and certifying foundation casting works at MPA site .

As such it is requested to kindly furnish budgetary quotation for the same to email id mohamed.shaik@mptgoa.gov.in on or before 26/10/2022 at 15:00 Hrs .

EXECUTIVE ENGINEER (E-HR)
MORMUGAO PORT AUTHORITY

1.0. GENERAL

Mormugao Port Trust invites the quotation for the work of “**Third party inspection service for highmast Towers of 30 meter heights and its accessories at Mormugao Port Authority**”

Terms and Conditions:

- 1) The firm shall have a valid Authorization certificate ie NABCB or equivalent for carrying out inspection work. Copy of the certificates shall be enclosed along with the offer, failing which offer shall be liable for rejection.
- 2) TPI shall carryout the inspection at manufacturers works also.
- 3) The offer rate shall be inclusive of travel expenses, lodging and boarding and other incidental charges etc.
- 4) All necessary facilities for inspection (instruments, test instruments, drawings etc) shall be arranged by the contractor/manufacturer.
- 5) After inspection, the TPI Agency shall submit the inspection report to MPA. TPI Agency shall give dispatch clearance to the Manufacturer/contractor to deliver the inspected items to site at MPA.
- 6) Two days prior notice will be given in advance to carry out the inspection.
- 7) Payment terms
 - a) TPI shall submit the invoice along with the complete inspection reports.
 - b) 100% payment will be made within 15 days from the date of receipt of undisputed invoice complete in all respect along with the report.

SCOPE OF WORK

- 2.1 The TPI agency shall carry out Inspection of the subject work as per Technical Specifications, relevant standards, drawings, QAP, Type Test report, SBC report, etc.
- 2.2 The TPI agency shall approve the foundation drawings of the highmast submitted by the contractor. These drawings shall be based on the Soil Bearing Capacity (SBC) tests carried out by the contractor and should be designed to withstand wind speed of minimum 180 Km/hr.
- 2.3 The TPI agency shall also inspect and certify that the foundation casted by the contractor are as per the drawings approved by TPI agency.
- 2.4 The TPI agency shall issue the **Inspection test certificates** as per the scope of work.
- 2.5 **All the personnel of the TPI agency shall be covered under a suitable insurance policy. Accidents, if any, fatal or otherwise at site shall be the sole responsibility of the contractor. The Port shall not be held liable for compensation in whatsoever manner under any circumstances**

Encl: Technical Specifications at Annexure-I.

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SCHEDULE OF PRICES AND QUANTITIES

Third party Inspection service for 30 mtr Height highmast Towers and its accessories

Sr. No.	Description	Qty	Rate (Rs)	Amount
1	3 rd party Inspection by TPI agency for carrying out the inspection and certification of 7 nos 30 mtr. High mast lighting tower and its accessories as per the Technical specifications at manufacturers work site and approving the foundation design and certifying foundation casting works at MPA site .	LS		
Total				

(In Words Rupees _____)

_____ only)

Date:

Signature:

Place:

Name:

Address:

Office Seal of firm:

Note: The offered rates shall be exclusive of all taxes and duties. GST Tax shall be paid extra as applicable. If, any new tax will be imposed by State/Central Govt. and same will be reimbursed on producing documentary proof.

Payment shall be made after completion of entire work, No part work will be accepted.

Annexure-I

TECHNICAL SPECIFICATIONS

Mormugao Port Authority (MPA) plans to install 7 numbers 30 meters High Masts lighting towers with LED luminaries, on the newly extended Railway platform.

Applicable Standards:

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

<u>Code No.</u>	<u>Title</u>
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** confirming 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.

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 **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 dislodged 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

Cable of size 4 X 10 sq.mm, copper conductor armoured cable for High Mast lighting load and 4 x 4 sq.mm copper conductor armoured cable for motor supply shall be provided from control panel to the base compartment of the high mast. Both of these cables shall be taken to the base compartment of the high mast from control panel through pipes of suitable diameter embedded in the foundation for protection of the cables.

The cost of the incoming power cables provided from the control panel to the base compartment of the high mast for lighting and motor supply shall be included in the High mast cost and no separate item/qty. shall be considered.

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.

1.10 Earthing Terminals:

Suitable earth terminal using 12 mm diameter stainless steel bolts shall be provided at a convenient location on the base of the Mast, for lightning and electrical earthing of the mast.

2. Control Panel (Feeder panel)

Design, Manufacture, Supply, Installation, testing and commissioning of stainless steel control panel with Rain Canopy. It shall be IP 66 compliant, dust, damp, vermin and weather proof fabricated from SS-316 grade Sheet of 2 mm. thick and shall be fabricated with the SS-316 angle & flat of suitable size as directed. It shall be provided with, single door type (Right side door hinge) with cam lock door sealing Gasket and Gland plate with required openings etc., complete. The drawing of the Panels shall be got approved from Engineer-in-Charge prior to manufacture. The control Panel shall be spacious for easy maintenance and shall be provided with following components with control wiring with 10 Sq.mm copper wire and 4 Sq.mm copper wire for motor circuit and termination with suitable lugs. Work including supply & fixing of the components as per BOQ.

- i) MCCB, TPN, 100 A , 415 Volt, 25 KA, 50 Hz. - 2Nos. (1 as Incomer & other one for next high mast)
- ii) 25A, SP, MCB for High Mast lighting control - 3 Nos
- iii) 16A, 3 pole MCB for Motor Control -1 no
- iv) 24 Hrs. Time switch -1 no
- v) Auto Manual selector switch to bypass timer -1 no
- vi) 3 phase Air Break Contactor of 40 A capacity - 1 no.

vii) Forward and Reverse Contactors with push button control to raise/lower the lantern carriage for “fixed 3 phase, 415 V Winch Electric Motor of suitable rating” as per the recommendations of manufacturer.

vii) LED type indication Lamp, 220 V AC (Phase R, Y & B) - 1 Set

Suitable size and rating of electrolytic grade copper conductor/bus, phase to phase and Neutral with PVC sleeved color code shall be provided. Suitable size connectors shall be provided for termination of control and power cables.

All these components shall be mounted in the Control panel by means of anti-corrosive hardware. The control panel shall be complete in all respects with cable glands, lugs for incoming and outgoing cables including interconnection with PVC insulated cable single core, standard copper conductor of 650/1100V grade.

The incoming cables shall be terminated on both the MCCB .The output of one,100 A MCCB will be connected to the high mast control circuit and the output of other 100 A MCCB will be connected to the next high mast cable.

The Feeder Pillar shall be provided with 1 Nos. SS terminals for earthing.

3 : Main panel

Design, Manufacture, Supply, Installation, testing and commissioning of Load Point Panel Outdoor Pedestal type with top Canopy. It shall be IP 66 compliant, dust, damp, vermin and weather proof fabricated from SS-316 grade Sheet of 2 mm. thick and shall be fabricated with the SS-316 angle & flat of suitable size as directed. It shall be provided with, single door type (Right side door hinge) with cam lock door sealing Gasket and Gland plate with required openings etc., complete. The drawing of the Panels shall be approved by Engineer-in-Charge prior to manufacture. The main Panel shall be spacious for easy maintenance and shall be provided with following Items.

i) 200 Amps, 35 KA, TPN MCCB – 2 Nos. (1 each for Incoming and spare)

ii) Neutral Link – 01 No.

iii) LED type indication Lamp, 220 V AC (Phase R, Y & B) – 1 set.

The MCBs and connector shall be mounted in the Panel by means of suitable hardware (nuts, bolts shall be of stainless steel). The Panel shall be complete in all respects with cable glands, lugs for incoming and outgoing cables including interconnection with PVC insulated cable single core, standard copper conductor of 650/1100V grade.

Load Point Legs shall be stainless steel legs of 316-grade in reinforced foundation of suitable design.

The Load Point Panel shall be tested as per IS: 4237. All the components shall be panel mounting type and stainless steel hardware and shall be provided with 2 Nos. SS terminals for earthing.

3 Incoming Power Cable

- i) L.T. Aluminium XLPE cable of size 4 X 70 sq.mm for providing power supply to first 3 High Mast .
- ii) L.T. Aluminium XLPE cable of size 4 X 35 sq.mm for providing power supply to remaining 4 High Mast.

4 LUMINAIRES

350 W LED FLOOD LIGHT FITTINGS suitable for 30 m High mast applications. **Necessary warranty certificate of manufacturer for 350 W LED Flood light fittings has to be submitted for acceptance**

- 1) Rated voltage: 240 V AC, 50 HZ. Operating voltage: 120-270 V AC
- 2) System wattage: 350 w
- 3) P.F: ≥ 0.95
- 4) Lumen efficiency: $>120\text{L/W}$
- 5) CCT & CRI :- 5500K & >70
- 6) Driver efficiency: $>85\%$
- 7) Total lumens: ≥ 40000 (system efficiency)
- 8) Protection: O.C, SC, Surge protection of min 10 KV , SPD
- 9) Mounting: bracket
- 10) Main housing/ heat shrinks material: Aluminum extruded/ Aluminum PDC
- 11) Housing end caps & CG box: aluminum PDC
- 12) Front cover: clear toughened glass
- 13) LED lumens maintenance: 50000 hrs. @L70
- 14) Control gear: isolated, electronic, CC drive
- 15) Hardware: SS
- 16) IP:66
- 17) Impact resistance: 1K07
- 18) Name of the make: shall be engraved/embossed/printed on light fitting
- 19) Fitting shall have NABL certification

6. Civil foundation:

The firm shall furnish necessary civil foundation drawing for approval of TPI Agency based on the soil bearing capacity (SBC) test results conducted by the bidders at their own cost. The foundation shall be designed to meet the soil conditions and **approved by TPI Agency**. The foundation provided shall have adequate bolts of adequate diameter and height for anchoring the base plate of the mast. The High Mast Towers along with base plate shall be erected on the concrete foundation which has to withstand minimum wind speed of 180 Km/hr. as per firms design and approved by TPI Agency. The contractor shall ensure correct vertical and horizontal alignment of the foundation bolts while carryout the foundation works by using suitable steel template. Necessary electrical power supply required for erecting towers will be provided by MPA at free of cost at nearest possible point. However, water arrangement and conveying the same to site shall be in the scope of contractor.

Note:

The Tenderer shall inspect the site and get acquainted with the nature of civil foundation that is required for erecting the High Mast before offering their Tender.

10. GENERAL NOTES:

All the Hardware materials/Miscellaneous materials should be galvanized and conform to IS and Specification and got approved by TPI agency before installation and commissioning.

The High Mast, lighting fixtures, cables etc. supplied for the work should conform to Applicable Standards as per Technical specifications of Tender Document. 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. The contractor should provide all facilities to test the materials at site.

11. GUARANTEE PERIOD:

- a. The turn-key project in total 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.

Necessary warranty certificate of manufacturer for 350 W LED Flood light fittings has to be submitted for acceptance.



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