



नव मंगलूर पत्तन प्राधिकरण
NEW MANGALORE PORT AUTHORITY
यांत्रिक अभियंता विभाग
Mechanical Engineering Department
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No.8/3/2023/Ele. Dvn/EQ/07/02

Date: 19.07.2023

To,

Sir,

Sub: -NMPA-EE (E) - "Third Party Inspection Services for 20 mtr height High Mast Towers and its accessories" - Quotation invited - Reg.

NMPA intends to engage third party inspection agency for the inspection of "20mtr height High Mast Towers and its accessories" at manufacturer's work site of M/s. VIPIN S.T. Poles Pvt. Ltd., Bugana Road, Village Sulkhani, Hisar, Haryana - 125121.

Therefore, quotations in sealed cover superscribed as "Third Party Inspection Services for 20 mtr height High Mast Towers and its accessories" addressed to **The Executive Engineer (Elec.), Electrical Division, Administration Building, New Mangalore Port Authority, Panambur, Mangalore- 575010** are invited in accordance with the instructions to the Tenderer, Terms & Conditions as detailed below, which may please be submitted not later than **3.00 PM on or before 26.07.2023**. Quotations will be opened on the same day at 3.30 PM in the presence of the tenderers who wish to be present.

Sl. No	Description of Work	Qty	Rate (Rs.)	Rate in words	Amount (Rs.)
1	20mtr height High Mast Tower and its accessories as per the Technical Specifications (Annexure-I) at manufacturer's work site.	2 Nos.			
	Total				
	Applicable GST				
	Grand Total				

TERMS & CONDITIONS:

- 1) The firm shall have a valid Authorization certificate for carrying out the inspection. i.e, NABCB or equivalent. Copy of the certificate shall be enclosed along with the offer, failing which the offer shall be liable for rejection.
- 2) TPI shall carryout the inspection at Manufacturer's works of firm M/s. VIPIN S.T. Poles Pvt. Ltd., Bugana Road, Village Sulkhani, Hisar, Haryana - 125121.
- 3) Applicable GST will be paid extra as per actual. GST Registration Certificate shall be submitted along with the offer.
- 4) Scope of Inspection shall be as per Technical Specification (Annexure-I), relevant standards, drawings, QAP, Type Test report, etc.
- 5) The offer rate shall be inclusive of travel expenses, lodging and boarding and other incidental charges etc.
- 6) All necessary facilities for inspection (instruments, test instruments, drawings etc) shall be arranged by the contractor /manufacturer. During inspection observations/remarks if any for High Mast & its accessories shall be communicated to NMPA. After attending the observations, TPI agency has to ensure the observations attended by the firm/contractor before issuing dispatch clearance.
- 7) After completion of inspection in all respect, the TPI Agency shall submit the original inspection report to NMPA, TPI agency shall give the dispatch clearance to the manufacturer/Contractor to deliver the inspected items to site at NMPA.
- 8) Inspection call to your office will be given in advance, two days prior to the date of inspection.
- 9) Income tax /Statutory taxes as applicable will be deducted at source while releasing the payment.
- 10) Payment terms –
 - (a) TPI shall submit the invoice along with the complete inspection report.
 - (b) 100% payment will be made within 15 days from the date of receipt of invoice along with the report
- 11) Offer shall be submitted in NMPA format only along with Terms & Conditions of Enquiry. Offer submitted in other format will not be considered for evaluation and liable for rejection.
- 12) The offer shall be valid for 90 days from the date of opening.

Encl: Technical Specifications

Seal and sign of Tenderer


Executive Engineer (E)
Electrical Division, NMPA

TECHNICAL SPECIFICATIONS

High mast : 20 Mtr

APPLICABLE STANDARDS :

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

<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.	Galvanising.
d). TR. No.7 2000 of ILE, UK.	Specification for Mast and foundation.

1.01 **Structure:**

The High mast shall be of continuously tapered, polygonal cross section, at least 20 sided, presenting a good and pleasing appearance and shall be based on proven In-Tension design conforming to the standards referred to above, to give an assured performance, and reliable service. The structure shall be suitable for wind loadings as per IS 875 part3 1987.

1.02 **Construction:**

The 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 metres. Thus a **20 M** mast shall be delivered in 2 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 minimum over lap distance shall be 1.5 times the diameter at penetration.

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 galvanised, internally and externally, having a uniform average thickness of 86 microns to 65 micron as per BSEN-1461/BS ISO1461/IS/2629-1966. Galvanising 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 and 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 Mast:

The mast structure shall be suitable to sustain an assumed maximum reaction arising from a wind speed as per IS 875. The design life of the mast shall be 25 years.

1.04 Lantern Carriage: with 8 arms

1.04.1 Fabrication:

A fabricated Lantern Carriage shall be provided for fixing and holding the **8 Nos. 400 W LED** flood light fittings and control gear boxes and also have a perfect self balance. 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 galvanised** after fabrication.

1.04.2 Junction Box.

Weather proof junction box, **IP 55** made of Cast Aluminium shall be provided on the Carriage Assembly as required, from which the inter-connections to the designed number of the flood light luminaires and associated control gears fixed on the carriage, shall be made.

1.05 Raising and lowering mechanism:

For the installation and maintenance of the luminaires and lamps, it will be necessary to lower and raise the Lantern Carriage Assembly. To enable this, a suitable Winch Arrangement shall be provided, with the winch fixed at the base of the mast and the 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 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 and the oil shall be readily available grades of reputed producers.

The winch shall have double drum having grooves to ensure perfect seating suitable and tight 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 shall 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, galvanised 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-corrodable material, and shall be of die cast Aluminium 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 galvanised 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-corrodable 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 talurit. 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 EPR insulated and PCP sheathed to get flexibility and endurance with **Rodent proof coating**. Size of the cable shall be minimum 5 core 4 sq mm copper. 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 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, multipin 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.

1.07 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 the lifting of the design load installed on the lantern carriage.

The power tool mounting shall be so designed that it will be not only self supporting but also aligns 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 limiter 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

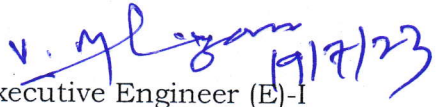
One number heavy duty hot dip galvanised lightning finial shall be provided for each mast. The lightning finial shall be minimum 1.2 M in length and shall be provided at the centre of the head frame. It shall be bolted solidly to the head frame to get a direct conducting path to the earth through the 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 & weather proof and yellow painted suitable for housing two nos. LED lamps equivalent to 100 W GLS lamp. The Omni directional red colour light shall be prewired up to the terminal block. The unbreakable red coloured polycarbonate dome shall be provided and secured to housing by 3 nos. screws. The Aviation obstruction light shall be Degree of protection: IP 43 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.


Executive Engineer (E)-I
NMPA, Panambur