

MORMUGAO PORT TRUST
ENGINEERING MECHANICAL DEPARTMENT

NOTICE INVITING BUDGETORY OFFERS

Name of Work	Providing LED based illumination at the parking area near Cruise Terminal building at MPT, Goa.
Date of submission of offers	on or before 29/09/2016 at 1430 Hrs.
Address for communication:	SE(E-H) Engineering Mechanical Dept., Mormugao Port Trust, Power House, Baina Workshop, Mormugao, Goa – 403802.
Contact Details	Phone :0832-2594515/ 2594579 Email : cme.mgpt@gmail.com , melchior_teles@yahoo.co.in , soaresfreddy@gmail.com
Website	www.mptgoa.com

CHIEF MECHANICAL ENGINEER
MORMUGAO PORT TRUST

TECHNICAL SPECIFICATIONS

1.1. GENERAL

Mormugao Port Trust, Goa, has proposed to provide LED based illumination at the parking area near Cruise Terminal building at Mormugao Harbour.

1.2. SCOPE OF WORK

The Scope of Work broadly includes:

- i) Supply, installation, testing and commissioning of 9 mtrs. Octagonal street light poles with two arms.
- ii) Casting of suitable RCC foundation for the poles.
- iii) Supply, Installation, testing and commissioning of LED light luminaries with accessories etc.
- iv) Excavation of cable trench through murrum / asphalted area / rocky area for laying LT Cables, where ever required.
- v) Supply and laying of L.T. cables with end termination and Straight through joints.
- vi) Supply, Installation, testing and commissioning of Outdoor stand mounted feeder pillar with suitable canopy as per IER.
- vii) Providing suitable earthing.
- viii) All the materials/works should be supplied and executed as per relevant/latest applicable IS Standard and IER.

2.1. TECHNICAL SPECIFICATIONS:-

2.1.1 OCTAGONAL POLES

- i. Supply, installation, testing and commissioning of 9 mtrs Octagonal poles with two arms for mounting the luminaries, uniformly tapered flanged type poles to be fixed on the foundation bolts with base plate arrangement as per approved drawing and design. The Octagonal Poles and brackets shall be suitable for use in climatic conditions prevailing in Mormugao/Goa. The Octagonal poles are to be designed for maximum wind speed of 180 km per hour, as per IS 875 Part 3.
- ii. The steel used for the manufacture of Octagonal Pole shall be as per BSEN 10025 or equivalent and the material for the base plate, foundation bolts, bracket, flange plates, shall be equivalent to or later than IS 2062.

- iii. The Steel used shall be aging resistant and suitable for hot dip galvanizing which should be in accordance to IS 2629 or upgraded IS specification.
- iv. All components of the pole and brackets shall be hot dip galvanized after completion of fabrication. It is recommended that the overall length of each section bracket is immersed in one dipping operation to ensure smooth and aesthetic finish. The galvanizing coating shall be smooth, continuous and uniform. It shall be free from acid spots and shall not scale or blister nor be removable while handling or packing.
- v. The Octagonal pole shall be evenly tapered from base to top.
- vi. The Octagonal pole shall preferably be fabricated in one single section.
- vii. There shall be no circumferential welded joint in Octagonal Poles.
- viii. Electrodes used shall be compatible with the grade of steel being used and have Mechanical properties equal to those of the steel used.
- ix. All welds shall ensure no fissures inside or outside or outsidess surfaces, and no Blowholes.
- x. Door Reinforcement must be firm with locking arrangement preferably with LN Keys/padlocks.
- xi. Fixing of poles shall be on foundation bolts with base plate arrangement.
- xii. 16 sq. mm Aluminium cable shall be used for loop in/loop out wiring between feeder panel and light poles. Lugs of appropriate size of proper quality suitable for 16 sq. mm cables should be used to terminate cable on terminals.
- xiii. Wiring between terminals, MCB and the light fittings shall be with 2 core copper wire of 2.5 sq mm.
- xiv. The bidder could submit their own designs for better look. The detailed drawing of street light poles should be enclosed.
- xv. Sample of street light pole complete in every respect shall be got installed at site for testing purpose and got approved from Engineer in-charge.
- xvi. A junction box shall be provided for each street pole and shall house a HRC fuse of 5A each. The JB shall be provided with cable glands for entry of cables and shall be properly sealed to prevent ingress of water.

Height of the poles	Top dia	Bottom dia	Plate thickness	Base Plate	Foundation bolt size mm
9 mtrs	70mm	155mm	3 mm	260x260x16	4 nos. of M24 x750mm long 'J' bolt

2.1.2 RCC FOUNDATION

The RCC Foundation for the poles shall be of M-25 type with M24 bolts mentioned above with suitable GI nuts and washers and embedded in concrete with template and GI galvanized foundation. Before casting at site the drawings to be approved from Port's Civil Department.

2.1.3 LEDS

Two nos. LED light luminaries of 120 Watts shall be provided on each arms of each of the poles. The LED lamps and LED luminaries shall be as per relevant IS Standard and the Contractor shall furnish LM-79 and LM-80 test certificates from NABL approved laboratories for the supplied LED luminaries and fittings.

Input Voltage	240V, 50 Hz
Operating voltage	140-280V, 50 Hz
Usage Hours	10-12 hours per day
Power factor	> 0.95
Life expectancy	Above 50,000 hours
Rated Wattage	120 W
Ingress protection	IP 66
Surge protection	Greater than 3 KV
THD	Less than 10%
Luminary Casing	Pressure Die cast Aluminium frame with heat resistant toughened clear glass fixed with SS screws.
Thermal Management of LED	Epoxy powder coated pressure die-cast aluminium housing with weather proof gasket for LEDs and control gear compartment.

2.1.4. OUTDOOR FEEDER PILLAR:

- i. Feeder light feeder pillar shall be suitable for 220V, 1 phase, 50 Hz supply and shall be outdoor type with canopy and shall be free standing floor type. The panel shall be double door, dust and vermin proof, of SS304 sheet (14 SWG for body and mounting plate and 16 SWG for doors, partitions and canopy). The tentative dimensions of the feeder pillar shall be 1300 mm x 1400mm x 600mm (LXHxD). Feeder Pillar shall be duly fixed on MS angle iron frame work of size 50mmX50mmX6mm (NS) 90 cm long legs out

of which 45 cm duly grouted in cement concrete 1:2:4 (1 cement 2 sand 4 stone aggregate 20mm).

- ii. The pillar should have a canopy with a sloping overhang of about 0.5 mtrs on each side to prevent ingress of water.
- iii. It should be robust in construction and capable of withstanding the vibration normally experienced due to vehicular traffic.
- iv. The cubical will be required to be mounted on cement concrete plinths.
- v. Street light feeder pillar shall be provided with incoming & outgoing MCCB / MCB of appropriate rating and in desired quantity depending on total no. of circuits in use. Outgoing shall have a least one spare circuit all the time.
- vi. Street light feeder pillar shall be made up of CRCA sheet steel and shall be dust and vermin proof providing a degree of protection of IP 66. The thickness of sheet steel enclosures shall be 2 mm minimum for load bearing and 1.6 mm for other members.
- vii. A 32A TPN MCB (incomer), single dial timers, 25A TP contactor for the automatic switching of the luminaries.
- viii. Internal hinged doors shall be provided, where all the material & control equipment shall be flush mounted. The incomer switchgear shall have interlocking mechanism so as to prevent opening of the door when the switch is ON and to prevent closing of the switch when the door is not fully closed. However, a device for bypassing the door interlock shall be provided to enable the operation of the switch with the door open, when necessary, for examination / maintenance.
- ix. External hinged door shall be provided with all round neoprene gasket with padlocking arrangement.
- x. All accessible live connection/metals shall be shrouded and it shall be possible to change individual fuses, switches, from the front of the boards/panels without any danger of contact with live parts.
- xi. Adequate interior cabling space and suitable removable cable gland plate (min. 3 mm thickness) plates shall be provided for bottom entry of cables through glands. Necessary number of glands to suit the required cable sizes shall be provided. Cable glands shall be double compression type made of chrome-plated brass.
- xii. Feeder pillar will have LED type 'SUPPLY ON" indicating lamps. Indicating lamps shall be of the clustered LED type and low watt consumption. Lamps shall be provided with series resistors.
- xiii. Earth bus of 50x6 GI flat with zinc plated bolts and nuts shall be provided in the bottom of the panel.

- xiv. Internal wiring of the panel shall be done using flexible copper cables of appropriate sizes. All the wires shall be numbered and ferrules shall be provided for easy identification.
- xv. Proper clip-on stud type terminals of appropriate rating shall be provided for termination of
- xvi. incoming as well as outgoing cable inside the feeder pillar.
- xvii. Inside the door of lighting panels a single line circuit diagram / description shall be fixed for ready reference.
- xviii. As required all sheet steel enclosures of panels will be chemically cleaned rinsed, phosphate & dried. After the treatment steel surfaces will be given two coats of primer & finished grey enamel paint or powder coating of shade 631 of IS - 5. Coating thickness shall be minimum 50 microns.

2.4.3 SUPPLY AND LAYING OF 1.1KV, 31/2 CORE X 50 SQ.MM XLPE CABLE

- i. The cable measurements are tentative and may vary as per site condition. The cable is to be laid from the Load Distribution Centre (LDC) after gate no.1, to the feeder pillar at the parking area. The scope includes supply and laying of L.T. 1.1KV, 31/2 core x 50 sq.mm XLPE type Aluminium armoured conforming to IS 7098 Part I 1988 with latest amendments with ISI mark of approved make. The cables are to be laid as per IS: 1255 and as detailed under:
- ii. Note: Test certificates from the manufacturers for the cable shall be submitted along with the supply of cable.
- iii. The cable shall be laid Earth / concrete road cutting / of size 60 cm width x 90 cm depth to lay each run of the above cable covered with RCC trough (in case of road cutting) and re-closing with excavated soil and make it original level. The Asphalted area shall be restored by refilling, compacting, soling (15 cms) and concrete laying of mix 1:2:4 (15 cms). Required RCC Troughs shall be supplied by the Contractor. For road crossing 'C' Class G.I pipe shall be provided and shall be supplied by the Contractor. The size of pipe shall not be less than 10 cm in diameter for each cable. The pipe shall be laid at an angle to avoid sharp cable bends at the point of entry and exit.
- iv. The end termination for 1100V grade underground cables shall be of crimping type lugs shall be supplied by the contractor. The crimping type lugs shall be installed by highly skilled personnel.

2.4.4 SUPPLY AND LAYING OF 1.1KV, 4 CORE X 16 SQ.MM XLPE CABLE

- v. The cable measurements are tentative and may vary as per site condition. The cable is to be used for loop in./loop out wiring between feeder panel and Octagonal poles. The scope includes supply and laying of L.T. 1.1KV, 4 core x 16 sq.mm XLPE type Aluminium armoured conforming to IS 7098 Part I 1988 with latest amendments with ISI mark of approved make. The cables are to be laid as per IS: 1255 and as detailed under:
- vi. Note: Test certificates from the manufacturers for the cable shall be submitted along with the supply of cable.
- vii. The cable shall be laid in through murrum / rocky area, by excavating a trench 60 cm x 90 cm cushioned with sand, lay the cable and refill the trench, as applicable.
- viii. The end termination for 1100V grade underground cables shall be of crimping type lugs shall be supplied by the contractor. The crimping type lugs shall be installed by highly skilled personnel.

2.4.5 SUPPLY AND LAYING OF 1.1KV, 3 CORE X 2.5 SQ.MM TRAILING CABLE

- ix. The cable measurements are tentative and may vary as per site condition. The cable is to be laid internally from the individual JB's of the Octagonal poles to the LED light fittings. The scope includes supply and laying of L.T. 1.1KV, 3 Core 2.5 sq. mm. Aluminium EPR Insulated PVC sheathed flexible conforming to relevant IS standards with ISI mark of approved make.
- x. Note: Test certificates from the manufacturers for the cable shall be submitted along with the supply of cable.

2.4.6 EARTH PITS AND EARTHING:

- i. The earth system shall be designed and installed so as to meet the requirement of CEA. The value of resistance of earth system should not exceed the value acceptable to the Central Electricity Authority.
- ii. The earth value shall be obtained in accordance with relevant standards and the earth values shall be measured after installation in the presence of Trust Engineer.
- iii. The earth connection shall be made of GI strip of adequate size conforming to IS 3043 to safely carry the maximum fault current for a short period without burning the conductor and pass on the fault current which is in excess of this, additional earth connections under fault condition and at no time the potential shall exceed 10 volts between the equipment and

earth. The earth system shall be mechanically robust and joints shall be capable of retaining low resistance even after many passages of fault current.

- iv. Interconnections and joints for earth conductors shall be riveted and soldered for retaining low resistance.
- v. Each earth bar should be connected to the main earth through a bolted removable link. All ground connections shall be compounded and braided.
- vi. In cast iron pipe earthing with copper plate the earth electrodes shall be driven to a depth of not less than 2.7 meters below the ground level and at least 3 meters away from the building and any other earth electrodes treating the soil surrounding the electrodes with the salt, coke and charcoal in accordance with IS 3043.
- vii. The internal diameter of the cast iron earth electrode shall not be less than 100mm. The thickness of the cast iron pipe shall not be less than 13mm. The electrode shall as far as practicable be embedded below permanent moisture level and placed without over lapping the resistance area of earth electrodes. Suitable size flange shall be provided to the cast iron pipe for connecting the earth leads.
- viii. A suitable brick cemented enclosure for neutral and body earth will be as per IE Rule (i.e) 450mm x 450mm with 125mm wall thickness. The depth of the masonry work will be not less than 600mm below the ground level and with suitable cover provided by the contractor enclosing the earth electrodes and shall be able to take up the load of lorries, etc., operating in that area. The top surface of the earth pit shall be in level with the finished surface level of the surrounding area.

2.4.7 SUPPLY AND LAYING OF GI FLAT:

Supply and laying of 1 run of 50 x 6 mm GI flats from the Earth Pits to JB's of the poles along with 4 core X 16 Sq.mm. cable length.

2.5 INSTALLATION, TESTING AND COMMISSIONING

Installation, testing and commissioning of the above Octagonal poles complete with its JB's, Feeder pillar, accessories/ associated items, etc. The tentative drawing/ of the Parking area is shown for the reference. However, the work has to be carried out as per the site conditions.

2.6 LIST OF APPROVED MAKES:

Sr. No.	Item	Name of Manufacturers
1	Selector switches, Push buttons Emergency Switches	KAYCEE / L & T / GE / BCH / LEGRAND
2	HRC Fuses	L & T / GE / SIEMENS / ABB / INDO KOPP
3	Indicating light	AE / KAYCEE / VAISHNAV / L & T /SIEMENS
4	MCB	L & T / LEGRAND / SIEMENS / ABB / SCHNEIDER
5	Light Fixtures	PHILIPS / BAJAJ / WIPRO / CROMPTON
6	Lamps and Tubes	PHILIPS / WIPRO / BAJAJ / CROMPTON
7	Cable lug & Cable Gland	DOWELLS / JHONSON / RAYCHEM
8	Contactors	L&T / SCHNEIDER / SIEMENS/ABB / BCH
9	MCCB	L&T / SIEMENS / SCHENEIDER / ABB
10	Push Buttons	SIEMENS / ABB / TELEMECANIQUE / L&T / SCHNEIDER
11	Relays	L&T / ABB / SIEMENS / SCHNEIDER/AREVA
12	Timers	L&T / SIEMENS / TELEMECANIQUE/ABB
13	Indicating Light	L&T / SIEMENS / TELEMECANIQUE / ABB / GE
14	LT Cable (XLPE and FRLS)	UNISTAR / FINOLEX/ NICCO / HAVELLS / RPG / UNIFLEX
15	Termination Kit	BIRLA 3M / RAYCHEM /DENSON
16	Selector Switch	KAYCEE /L&T/ SIEMENS / BCH/ GE /SALZAR
17	Street poles	BAJAJ / TRANSRAIL / CG / PHILIPS
18	LED luminaries & fittings	BAJAJ / PHILIPS / CG / WIPRO
19	Items not covered above	As per samples approved

BILL OF QUANTITIES

Sr No	Description	Unit	Qty	Rate	Amount
1.	Supply, installation, testing and commissioning of 9 mts Octagonal poles as per Technical Specifications.				
a.)	Supply	Nos.	05		
b.)	Installation, testing and commissioning	Nos.	05		
2.	Casting of suitable RCC foundation, M-25 with proper earthing SS bolts/nuts /washers etc., as per Technical Specifications.	Nos.	05		
3.	Supply, Installation, testing and commissioning of LED light luminaries as per Technical Specifications				
a.)	Supply	Nos	10		
b.)	Installation, testing and commissioning	Nos	10		
4.	Supply of following XLPE type LT Aluminium armoured cable, as per Technical Specifications and confirming to IS – 7098 Part-I, 1988 with latest amendments				
a.)	31/2 C x 50 sq mm	Mtrs	1200		
b.)	4C x 16 sq mm	Mtrs	250		
5.	Supply of following EPR insulated LT cable , as per Technical Specifications and confirming to relevant IS specifications				
a.)	3C x 2.5 sq. mm.	Mtrs.	50		
6.	Laying, testing and commissioning of following cable sizes as per Technical Specifications and confirming to relevant IS standards.				
a.)	10 to 50 sq. mm.	Mtrs	250		
b.)	Above 50 to 120 sq. mm	Mtrs	1200		
7.	Supply, installation, testing and commissioning of Outdoor stand mounted feeder Pillar with suitable canopy as per Technical Specifications				
a.)	Supply	No	01		
b.)	Installation, testing and commissioning	No	01		
8.	Providing Earth Pits as per technical Specifications and relevant IS standards.	Nos.	04		
Sr	Description	Unit	Qty	Rate	Amount

No					
9.	Supply, installation, testing and commissioning of heat shrinkable straight thorough joint kit for 1.1 KV LT cable, 31/2 C x 50 sq mm as per technical Specifications (shall be operated if required)				
a.)	Supply	No	1		
b.)	Installation, testing and commissioning	No	1		
		GRAND TOTAL			

(In words Rupees _____)
 _____)

Note: The offered rates shall be inclusive of all taxes except Service Tax which will have to be paid/reimbursed by MPT as applicable. However, any new tax will be imposed by State/Central Govt. and same will be reimbursed on producing documentary proof.