DEENDAYAL PORT AUTHORITY
ISO 9001:2008 | ISO 14001 | ISPS Compliant Port

Office of Executive Engineer (Electrical), Ground Floor, Nirman Building, New Kandla, Kutch, Pin Code 370210.

No.: EL/WK/2858 Date: 28/05/2025

EXPRESSION OF INTEREST [EOI]

"Supply, Installation, Testing & Commissioning of all the equipment's of Roadway Lighting system from LC 2368 to 16th CB along road, Railway line at Kandla".

(This EOI is issued to elicit Expression of Interest from the parties interested in the work and does not constitute any binding commitment from the Deendayal Port Authority to proceed with the work or invite any or all the parties in the subsequent bidding process. The Open Tenders will be issued subsequently.)

Executive Engineer (Electrical), DPA invites Expression of Interest for the work of Supply, Installation, Testing & Commissioning of all the equipment's of Roadway Lighting system from LC 2368 to 16th CB along road, Railway line at Kandla, from the reputed firms from those who have executed similar work in Government/public sectors and other leading private organizations. The Expression of Interest (EOI) documents containing details of Scope of Work and Technical Specifications are enclosed herewith.

The interested firms are requested to submit their expression of interest for the said work in BOQ format as enclosed at Annexure I. The completed EOI (Expression of Interest) shall be submitted to the office of the undersigned on or before 05/06/2025. A soft copy of EOI is also acceptable through e-mail Id anantrao.kumthekar@deendayalport.gov.in & deepak.hazra@deendayalport.gov.in .

-/sd

Executive Engineer (E)
Deendayal Port Authority

Annexure - I

Sr. No.	Description	Qty.	Unit	Rate	Amount
Part A: Electrical Item					
1	Supply at site 9 Mtr. long Hot Dip galvanized octagonal street light pole with detachable double Arm as per Technical Specification No. 1. A) 9 Mtr. long Octagonal Type Street light pole with 1.5 Mtr. long double arm	225	Nos.		
2	Erection, Testing & Commissioning of supplied 9 Meter long Hot Dipped octagonal pole along with civil foundation as per Technical Specification No. 2.	225	Nos.		
3	Supply, erection, testing & commissioning at site, of Polygonal galvanized high mast tower of 20 Mtr. as per Technical Specification No. 3 A) Supply B) Erection, testing & commissioning	 5 5	 Nos. Nos.		
4	Supply of Energy Efficient LED Street Light luminary & Flood Light Luminary as per Technical Specification No. 4 A) 90W LED(Clear Cool White) Street Light B) 250W LED(Clear Cool White) Flood Light	 500 60	 Nos. Nos.		
5	Fixing of LED Street Light & Flood Light Luminary with all accessories as per Technical Specification No. 5 A)90W LED Street Light B)250W LED Flood Light	 500 60	 Nos. Nos.		

6	Supply at site 4 Core, LT armoured aluminium conductor XLPE cable of 1.1KV grade of the following type & size as per Technical Specification No. 6 (a)4 Core, 16 Sq. mm (b)4 Core, 70 Sq. mm (c)4 Core, 120 Sq. mm	7600 7600 1000	Mtr Mtr Mtr		
7(a)	Laying of LT armoured alluminium conductor XLPE cable of 1.1KV grade of the following type & size through Hard/Soft Soil as per Technical Specification No. 7(a). i) Laying of single length cable upto 4.0 core x 120 Sq.mm.	500	Mtr		
7(b)	Laying of LT armoured aluminium conductor XLPE cable of 1.1KV grade of size up to 120 Sq.mm through Road crossing in Horizontal boring with suitable size of HDPE heavy duty pipe as per Technical Specification No.7(b) i) Laying of single cable length 4.0 core x 120 Sq.mm through horizontal boring in suitable single HDPE pipe with all materials & labour.	1000	Mtr		
7(c)	laying/ Fixing of size upto 4 core, 16 to 70 Sq. mm LT armoured aluminum Conductor XLPE Cable of 1.1KV Grade through existing octagonal pole as per Technical Specification No. 7(C)	600	Mtr		
7(d)	Fixing of LT/HT cable on existing cable tray along with GI binding wire at one meter distance as per Technical Specification NO. 7(d)	6500	Mtr		
7(e)	Supply and fixing of perforated HOT DIP GI Cable tray of size 300mm Width,2500mm length, 50mm dip and 3mm thick, this also includes its all accessories as per Technical Specification No. 7(e). (A)Supply (B)Fixing	6500 6500	MTR MTR		

8	Supply, Installation, Testing and Commissioning of Double Pole Structure with 11KV A.B Switch & H.G Fuse on 9 mtr RSJ pole of 200KG complete with Labour and Material as per Technical Specification No. 8. A) Supply B) Installation, testing & commissioning	 4 4	 Set Set		
9	Supply & Fixing of Street Light MS Feeder Pillar as per Technical Specification No.9 (A)Supply (B)Fixing	 5 5	 Nos. Nos.		
10	Preparation of poles earthing system with GI pipe as per Technical Specification No.10	15	Nos.		
11	Preparation of Feeder Pillar earthing system with GI earth plate including required accessories and civil work as per Technical Specification No. 11	10	Nos.		
12.	Reclamation to low laying area at various locations as per site conditions as per Technical Specification no.12	1000	M3		
13	Supply of 11KV HT 3C X 150 sqmm insulated armored XLPE Aluminum conductor as per Technical Specification No. 13.	2000	Meter		
14	Laying in Hard/Soft Soil for 11KV HT 3C X 150sqmm XLPE Aluminum conductor as per Technical Specification No. 14	1300	Meter		
15	Laying for Railway/Road Crossing/RCC through HDD Single length 11KV HT 3C X 150sqmm XLPE Aluminum conductor as per Technical Specification No. 15	700	Meter		
16	Servicing of Existing 11KV Breaker as per Technical Specification No. 16	5	Set		
17	Supply, fixing and testing of Indoor Cable Termination kit for 11kV 150sqmm XLPE Cable as per technical specification no.17 (a)Supply (b)fixing, testing & Commissioning	 3 3	 Nos. Nos.		

18	Supply, fixing and testing of Outdoor Cable Termination kit for 11kV, 150 sqmm XLPE Cable as per technical specification no.18 (A)Supply (B)fixing, testing & Commissioning	 6 6	 Nos. Nos.		
19	11KV Straight through Joint as per Technical Specification No. 19	2	Nos.		
20	Supply, Installation, Testing & Commissioning Outdoor type M.S. Feeder pillar along with Electrical Accessories as per Technical Specification 20. (A)Supply (B)Installation, Testing & Commissioning.	 6 6	 Nos. Nos.		
21	Supply, Installation, Testing & Commissioning of 11/0.433 KV, 50 Hz., 100 KVA outdoor type 3-star rating distribution transformer, complete with its accessories & protective, measuring devices and as per technical specification no.21. (A) Supply (B)Installation, Testing & Commissioning	 4 4	 Nos. Nos.		
22	Preparation of earthing system with Hot Dip GI chemical electrode & back fill compound for transformer neutral earthing as per Technical Specification No. 22.	4	Nos.		
23	Supply, Laying, connecting of Hot dip GI Strip of 50×5 mm size between earth station to neutral of Transformer as per Technical Specification No. 23	40	MTR		
24	Supply and Erection of protection guard having the height of 1.5 m above ground level fabricated from main horizontal and vertical members of MS angle of size 75×75×10 mm with cross bracing of MS angle of size not less than 50×50×6 mm including necessary foundation work as per technical specification no. 24.	7	Nos.		

Total	

(In words Rupees_____only)

(NOTE: The rates should be inclusive of all taxes, duties, fees, cess etc. and all incidental charges; but exclusive of GST).

Signature & Seal of Firm

-/sd
Executive Engineer (E)
Deendayal Port Authority

SCOPE OF WORK

The Specification is intended to cover the Supply, Installation, Testing & Commissioning of all the equipment's of Roadway Lighting system from LC 2368 to 16th CB along road, Railway line at Kandla. The work includes associates service like civil & structural work, handling at site, insurance, erection, testing and commissioning of Roadway Lighting and handling over the same to the Engineer in charge after successful completion of the work. contractor has to complete the work with best standard of materials, The work shall be executed to the satisfaction of the Engineer in charge for Supply, Installation, Testing & Commissioning of equipment's. The contractor shall arrange all types of tools & tackles with arrangement of temporary power for installation & testing at his own cost. The contractor shall submit as made layout drawing of complete Roadway lighting system in four set after completion of work.

TECHNICAL SPECIFICATIONS

Technical Specification No. 1

Supply of 9 Meter Octagonal Pole with 1.5-meter dual arm with complete its accessories.

1.1 The Product should be designed for the specific climatic and environmental conditionsof the region to ensure full durability and safety throughout its designed life.

1.2 All the Octagonal Poles shall be designed to withstand the maximum wind speed of 180 km/Hr and as per IS 875 or latest. The top loading i.e. area and the weight of fixtures are to be considered to calculate maximum deflection of the pole and the same shall meet the requirement of BS EN 40-2-1&3 or as per latest.

1.3 The pole shaft shall have octagonal cross section and shall be continuously tapered with single longitudinal welding. There shall not be any circumferential welding of the pole shaft. The welding of the pole shaft shall be done by Submerged Welding process.

1.4 All octagonal pole shafts shall be provided with the rigid flange plate MS FE410 conforming to IS 2062 of suitable thickness with provision for fixing minimum 4 foundation bolts. The base plate shall be fillet welded to the pole shaft at two locations i.e. from inside and outside. The welding shall be done as per qualified MMAW process or as directed by Engineer in charge.

1.5 The materials of the pole as follows:

(a) Pole - Conforming to grade S355J0, with 4mm wall thickness.

(b) Base Plate: - Fe 410 Conforming to IS 226/ IS 2062, b/w poles & Base plate four Nos. of shifters in each pole shall be provided.

(c) Foundation Bolts: - Hot dipped 6.8 Gr. as per IS 1367 or as per latest.

(d) Pole Sections: - The Octagonal Poles shall be in single piece with single

longitudinal welding joint,

(e) Galvanization: - The poles shall be hot dip galvanized as per IS 2629 / IS 2633/ IS 4759 and BSEN ISO 1461 standards or as per latest with average coating thickness of 100 micron & above. The galvanizing shall be done in single dipping.

1.6 The pole manufacturing & galvanizing unit shall be ISO 9001: 2000 & ISO 14001 or latest certified to ensure consistent quality & environmental protection.

1.7 The poles shall have integrated Junction box with openable door of adequate size (Not less than 500mm length) at the elevation of 1500 mm from the base plate. The door shall be hinged type with mechanical interlock, dust proof, weather proof and vandal resistance and shall ensure safety of inside connections and components. The door shall be flush with the exterior surface and shall have suitable locking arrangement. The pole shall be adequately strengthened at the location of the door to compensate for the loss in section.

1.8 The suitable cutout for door opening may be 500mm with reinforced & whether proof having locking arrangement by allen key (same shall be submitted to DPA in 4 Sets) of the Junction Box shall permit clear access to the components inside viz., insulated termination strips, connectors, MCBs, cables etc. There shall also be suitable bolt arrangement for the purpose of earthing.

1.9 Electrical connections - Four-way heavy duty Insulated connectors shall be provided, suitable for connecting 1.1 kV grade, 4 core X16 sq.mm. Al. cable. It shall also in house 1 no. 10 amps SP MCB,2.5 sq.mm connectors for looping with 2.5 Sq.mm Copper wires for connecting to the luminaries through 0.6 kV grade, 3 core X 2.5 mm^2 PVC insulated copper conductor flexible un-armoured Cable from the terminal block to the fixture within the pole. All the un-armoured & armoured cables shall be pass through Metallic & Polycarbonate gland of suitable size and suitable brass lugs for cables & cables laid through the pipe shall be without any joint.

1.10 Two nos. Earth Boss shall be provided at the bottom of the pole or on base plate (diagonally opposite) suitable for connecting 25X6 mm GI/ CU earth strip or SWG wire for earthing of the poles.

1.11 Earthing of each pole shall be carried out with one dedicated earth coil. The earth coil shall be GI as recommended in the latest version of IS. The earth coil shall be connected with 8 swg two GI wire to the two distinct earth boss on the pole.

1.12 Aesthetic appearance - All the grooves and carvings of the pole unit shall be free from any kind of distortion for a pleasing aesthetic appearance.

1.13 Top Mountings –The octagonal 9mtr pole should be supplied along with galvanized double arm bracket made from GI Pipe of suitable size of dia, 1.5 mt long suitable for it to install on top with its accessories as directed by Engineer in charge prior to approval of Engineer in charge with drawing, Luminaries fixing at dual arm as per design of LED Luminaries.

1.14 The Poles shall be bolted on a pre-cast RCC or at site along with set of foundation

bolts for greater rigidity under supervision & certified by Civil Department, DPA.

1.15 The Contractor shall carry out all the relevant tests and inspection in the presence of the DPA or Third Party Agency, before the dispatch of the poles at no extra cost to be borne by DPA.

1.16 All the material/equipment/accessories shall be supplied with manufacturer's test certificates at site.

1.17 CONTRACTOR shall submit the Proposed Product Catalogue, Detail Data sheet, spare parts list and drawing of Pole & Bracket along with the BID for each product quoted.

Technical Specification No. 2

Erection of 9 Meter Octagonal Pole with 1.5-meter dual arm with complete its accessories.

The poles shall be erected in plumb at a distance of 30 mtr, bolted on a precast RCC foundation with a set of four foundation bolts for greater rigidity. This includes fixing & erection of 09-meter-long with detachable type double arm Octagonal pole on foundation to be prepared by excavation of pit of 600mm (W) x 1000mm (L) x 1300mm deep after carrying out necessary excavation in the existing divider. All the waste material is to be dumped as directed by Engineer-In Charge.

This also includes Providing and laying in position machine batched and machine mixed design mix M-25 grade cement concrete for reinforced cement concrete work, using cement content as per approved design mix, including pumping of concrete to site of laying including the cost of centering, shuttering, finishing and reinforcement, including admixtures in recommended proportions as per IS: 9103 to accelerate, retard setting of concrete, improve workability without impairing strength and durability as per direction of Engineer-in-charge."(Note :- Cement content considered in this item is @ 330 kg/cum. "Excess/ less cement used as per design mix is payable/recoverable separately). Providing M-30 grade concrete instead of M-25 (Concrete with minimum cement content of 350 kg /cum at all floor levels) Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level and above. Thermo-Mechanically Treated bars of grade Fe-500 D or more. Foundation hot dipped GI bolt of size 900mm long "J" type of M24mm dia shall be buried in the RCC up to the length of 775 mm and 125 mm should be projected length over the foundation thereafter pit shall be filled with 1:2:4 CC mix of cement concrete and 6 to 20mm graded metal course aggregate concrete. DWC pipe of suitable size shall be kept while concreting for IN & OUT of cable. This also includes supply and installation of GI Coil earthing to each pole of 7 to 10 meter.

The termination and connection through insulated connector and DIN rail MCB with junction box shall provide, cable brass glands of suitable size including earth linking to the pole and junction box with 8 SWG GI wire with all materials and labours as directed by Engineer-in-charge. The above work is to be done under the direction & supervision of Civil /Electrical Department, DPA.

Technical Specification No. 3

Supply, Installation, Testing & Commissioning of 20-Meter-High Mast Tower at site.

This specification covers the design, manufacture, transportation, installation, testing and commissioning of the complete Signage, using fixed type of High Mast Towers, including the Civil Foundation Works.

The work include design, supply, erection, testing, commissioning of 20M high mast flood lighting towers, including the installation, testing and commissioning of LED cool white flood light and other electrical accessories, arrangement for raising and lowering the lights during maintenance.

APPLICABLE STANDARDS

The following shall be the Reference Standards for the loading of the high mast:
BS Code of Practice, CP-3, Gradient of wind related to height Chapter-V,
BS 4360 Grades of MS Plates
BS 5135 Welding
BD 729 Galvanising
Technical Report (TR) No.7 – 1996 Specification for Mast and Foundation.
IS 875 (Pt-III) 1987 Code of Practice for Design Loads for structure

TECHNICAL SPECIFICATIONS HIGH MAST

Structure

The High mast shall be of continuously tapered, polygonal cross section, as per proven design, presenting a pleasing appearance and shall be based on proven In- Tension design conforming to standards, to give an assured performance and reliable service.
The mast height shall be 20 meters, with minimum diameters as per proven design. Minimum plate thickness of bottom section shall be 6mm and other sections 5mm. The PCD of the mast flange shall be minimum 740 mm or as per proved design. The structure shall be suitable for wind loading as per IS-875, part-3, 1987 or relevant to site condition.

Construction

The mast shall be capable of safely withstanding the strong winds prevailing at site. The deflection at the top during heavy storm periods shall therefore be considered in the design and the mast designed in such way that the above deflection during worst periods is kept to a minimum value. The mast shall be fabricated from special steel plates, conforming to BS-EN10- 025, cut and folded to form a polygonal section as stated above and shall be telescopically jointed and fillets welded. The welding shall be in accordance with BS:5135. The procedural weld geometry and the workmanship shall be exhaustively tested on the completed welds. The 20-meter size mast shall be delivered in sections, and shall be jointed 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 thickness of 65 microns.

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, weather proof 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.

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, and shall be measured at a height of 10 meters above ground level.

LANTERN CARRIAGE Fabrication

A fabricated Lantern Carriage shall be provided for fixing and holding the flood light LED fitting. The Lantern Carriage shall be of special design and shall be of steel tube construction, the tubes acting as conduits for wires, with holes fully protected by grommets. The Lantern Carriage shall be so designed and fabricated to hold the required number of LED floodlight fittings and junction boxes, and also to have a perfect self-balance. The Lantern Carriage shall be fabricated in two halves and joined by bolted flanges with stainless steel bolts and plastic lock type stainless steel 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. and raise the Lantern Carriage Assembly. To enable this, a suitable Winch Arrangement shall be provided, with winch fixed at the base of the mast and the specially designed head frame assembly the top.

Winch

The winch shall be of C double drum type as per IS 807, suitable to lift optimum mechanical load,shall be operated manually & electrically ,Permanent oil bath of SAE 90 or equivalent of proven design. The gear ratio may be according to manufacturer's standard. However, the minimum working load shall be not less than 400Kg. The winch drums shall be 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 runs of rope remains on the drum even when lantern carriage is fully lowered and rested on the rest pads.

It shall be possible to remove the double drum after dismantling, through the door opening provided at the base of mast. Also a winch gear box for simultaneous and reversible operation of the double drum winch shall be provided as part of the contract.

Head Frame

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 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 caste aluminium alloy (LM-6). Pulley made of synthetic material 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 externally and internally, Close fittings 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.

Stainless Steel Wire Ropes

The suspension system shall be essentially be without intermediate joint and shall consist of any non-corrosive stainless steel of AISI 316 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 2350kg individually, giving factor of safety or over 5 for system at full load, the minimum recommended value as per the TR-7 referred to in the beginning of the specification. The end construction of

rope to 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, either bolted or else is provided on the wire ropes between winch and lantern carriage.

CABLE
Trailing cable EPR Insulated and PCP sheathed 2.5sqmm 5core annealed copper cable.

LED SPECIFICATION
As mention below tabular form in Technical Specification No. 4

Power TOOL (Integral to system)
3Phase, 415v ,50 HZ,AC +/- 5% Rating of the motor shall be suitable to the design with control & torque limiting protection single speed.

CIVIL FOUNDATION
High mast civil foundation is also in the scope of contractor, the design of foundation shall be approved from Design section of Civil Department, DPA, similarly its execution will also be under civil department. The soil bearing capacity is 1.5T/Mtsquare; however, during start of work contractor has to obtain complete detail of soil and based on same design is to be done. Work include complete materials & labour, and to entire satisfaction of Engineer In charge.

Lightening Finial, Earthing and Earthing Terminals
Suitable earthing terminals using 12 mm diameter galvanized bolts shall be provided at a convenient location on the base of the Mast. One earth pit pipe type as per IS 3043 shall be provided for each mast for lightening protection. One lightening finial is to be provided on top of mast.
Suitable Aviation obstruction light shall be provided as per the Law of the Land.

Erection, Testing & Commissioning:
Erection, testing & commissioning of High Mast towers which include complete CIVIL foundation work including filling & rolling the land/cutting of saplings. The foundation of High Mast shall be Raft Foundation. However, before making a Civil Foundation for High Mast towers, firm has to be take drawing/items approval from concern Civil Department, DPA.

Guarding:
Supply, Installation, testing & commissioning of guarding to 20 Mtr. High Mast GI tower along with guarding civil foundation. The guarding is to be fabricated from MS angle of 75X75X6 mm. duly welded and bolted to form square guarding of 5 mtr. X 5 mtr. complete with painting with two coats of metal primer & two coats of final finish enamel paint. The work includes complete labour & materials.

Technical Specification No. 04

Supply at site energy efficient 90W LED Street Light & 250W Flood Light fixture. The rate shall be firm and inclusive all taxes, packing and forwarding, insurance, loading at supplier's depot, transportation and unloading at site work. The LED fixtures should be suitable for pole pipe bracket.

The contractor shall take prior approval from the Engineer In Charge for make of LED Street

Light fixture.

Technical Requirements for LED Street Light are as under:

Sr. No.	Parameters	Requirements / Value
1.	Type	90W Street light(Clear cool white) LED Luminaire & 250W Flood Light LED(Clear cool white) Luminaries complete with all accessories including driver, internal wiring with flameproof wires, etc.
2.	LED chip make	CREE / NICHIA /OSRAM/LUMILED/SEOUL
3.	Rated Voltage	190V - 230V AC,
4.	Operating Voltage Range	Single phase 120-280-volt AC. But luminaries shallbe tested for 100V to 300 V AC
5.	Frequency	50 Hz +/- 3%
6.	Power Factor	> 0.95
7.	LED chip Efficacy	>150 Lm/Watt system lumen output at 25 degree C, supported by LM80 report, to be submitted.
8.	LED Drive current	>=350 mA<750 mA
9.	LED Beam Angle	As directed by EIC
10.	Colour Temperature	≥5500K.
11.	Rated Minimum LED Life(L70)	50000 Burning Hours (With only 30% LumenDegradation or 70% Lumen maintenance)
12.	System efficacy	≥ 100 Lm/Watt
13.	Total Lumen Output	CONTRACTOR to offer
14.	Colour Rendering Index of Luminaires	>70
15.	System Power Efficiency	≥ 90%
16.	Driver Type	Constant Current based Electronic Driver
17.	Driver Efficiency	> 90%
18.	Driver Life	>20000 hrs.

19.	Maximum temperature rise for Driver	<30 Deg C at 45 Deg C ambient
20.	Operating Temperature Range	-20 Deg C to + 50 Deg C
21.	Luminaries body temperature after 12 hours of continuous operation	≤ 30 Deg C from ambient
22.	Junction temperature	< 85 Deg C - self certified by Manufacturer
23.	Heat Sink Temperature	≤ 15 C from ambient
24.	Solder point temperature	< 70 Deg C
25.	Operating Humidity	10% to 95% RH
26.	Control Gear	Prewired with low smoke halogen free,fire retardant e beam cable up to terminal block. Fuse protection shall be provided inside.
27.	Operating Hours	Dusk to Dawn (max 12 Hrs.)
28.	Total Harmonics Distortion (THD)	<10%
29.	Construction	High power SMD and LED must be mounted on Copper MCPCB for high thermal conductivity and fastest heat transfer from the LED junction
30.	IP Protection	IP66 or more; no water stagnation anywhere
31.	Luminary Housing	Pressure Die Cast Aluminum (grade 5000 or similar) housing with corrosion resistant polyster powder coating & safety as per IEC 60598 / IS 10322. Mounting bracket with aiming & locking facilities. Large surface area with fins to dissipate the heat to ambient air
32.	Heat Sink	Well-designed thermal management system with defined heat sink - Aluminium extrusion
33.	Clip / Fasteners	Corrosion free/ Stainless steel.
34.	Wire	The connecting wires used inside the luminaries, shall be Low Smoke Halogen Free, fire retardant e- beam cable and fuse protection shall be provided in input side.
35.	Materials	Halogen free and fire retardant confirming to UL94.

36.	Optics	Secondary lens array should be provided for optimized roadway photometric distribution. Lens material should be optical high grade PMMA with more than 90% light transmittance
37.	IK protection for Optic Cover	>IK07
38.	Photometric measurements	LM-79/IS16105.
39.	Minimum Surge Protection	>10 kV
40.	Warranty / Guarantee	5 Years
41.	Protection Required in Driver Module	
a.	Short Circuit	Yes; Constant current limit mode.
b.	Open Circuit	Yes
c.	Over Voltage	Yes; Auto Isolation
d.	Over Temperature	Yes; Auto Shut Off.
e.	Under Voltage	Yes;
f.	String Open Protection	Yes;
42.	LED Type	B

Technical Specification No. 5

a) This includes fixing & commissioning of supplied 90W LED Street Light Luminary. The supplied fitting shall be fixed on 1.5 mtr double arm GI pipe bracket or as directed by EIC on nipple on the Octagonal Pole cross arm. This includes Electrical connections - Four-way connectors shall be provided along with Slide lock suitable for connecting 1.1 kV grade, 4 core X16 sq mm Al cable. It shall also inhouse1 no. 6-10 amps DP MCB,2.5 sq mm connectors for looping with 2.5 Sq mm Copper wires for connecting to the luminaries through 0.6 kV grade, 3 core X 2.5 mm² PVC insulated copper conductor flexible un-armoured Cable from the terminal block to the fixture within the pole. All the cables laid through the pipe shall be without any joint. This also includes necessary wiring, connections & necessary earth linking connections with all material, labour, tools & tackles as directed by Engineer-In-charge.

b) This includes fixing & commissioning of supplied 250W LED Flood light luminary Installation: This includes Installation of LED fittings on Lantern ring, with 3 core X 2.5 mm² PVC insulated copper conductor flexible un-armoured Cable complete wiring connection from JB to individual LED's fittings on towers, complete with man, material, Tools & tackles, connection etc. Dead load shall also be considered for balancing the fixtures.

Technical Specification No. 6

(a) This includes supply at site 1.1 KV grade, 4 Core, 16 Sq. mm Aluminum conductor, XLPE insulated armored cable confirming to IS: 7098 (Part-I) 1985 with up-to-date amendments and of approved make with ISI mark. The cable shall have marking/embossing at the interval of every meter showing its progressive length. The

contractor shall produce the routine test certificate during supply of cable at site. The rate shall inclusive of all taxes, duties, packing, forwarding, insurance, transportation and unloading at site of work etc.

(b) This includes supply at site 1.1 KV grade, 4 Core, 70 Sq. mm Aluminum conductor, XLPE insulated armored cable confirming to IS: 7098 (Part-I) 1985 with up-to-date amendments and of approved make with ISI mark. The cable shall have marking/embossing at the interval of every meter showing its progressive length. The contractor shall produce the routine test certificate during supply of cable at site. The rate shall inclusive of all taxes, duties, packing, forwarding, insurance, transportation and unloading at site of work etc.

(c) This includes supply at site 1.1 KV grade, 4 Core, 120 Sq. mm Aluminum conductor, XLPE insulated armored cable confirming to IS: 7098 (Part-I) 1985 with up-to-date amendments and of approved make with ISI mark. The cable shall have marking/embossing at the interval of every meter showing its progressive length. The contractor shall produce the routine test certificate during supply of cable at site. The rate shall inclusive of all taxes, duties, packing, forwarding, insurance, transportation and unloading at site of work etc.

Technical Specification No. 7

This includes laying & end termination of 1.1 KV XLPE armoured L.T cable in proposed hard & soft Soil /Laying on bricks/ Laying through horizontal boring / laying through double walled corrugated HDPE pipe of suitable size
Method of Laying.

a) This includes laying of single length cable of size of 4 core, 120 Sq.mm LT armoured aluminum Conductor XLPE Cable of 1.1KV Grade through excavation in soft/hard soil. The trench to be excavated 300mm wide, 600mm deep. The bed of 50mm of river sand shall be provided in the bottom of the excavated trench. The cable shall be laid over the bed of river sand. The cable shall be protected by providing and laying bricks both the sides lengthwise parallel to the cable & the gaps shall be filled with river sand. The cable shall be covered by keeping two bricks over the side bricks. The filling of the trench shall be done with the excavated stuff & should be watered and rammed properly to its original position. The excess excavated stuff shall be disposed off from the Site of work and spreaded in low laying area as directed. Contractor has to places cable route marker at and interval of 20-meter length the route marker shall be of Cement concrete of size 600 x 300 with embossed LT Cable duly painted by wall paint red colour. This also includes straight through joint if any required for completion of work. The work includes complete labour and materials and to entire satisfaction of Engineer-in-charge.

b) This includes laying of bunch of cable of size up to 4 core, 120 Sq. mm LT armoured aluminum Conductor XLPE Cable of 1.1KV. The contractor has to arrange horizontal boring machine and should bore minimum 2 meter below ground level this also, include insertion of HDPE Pipe of size 63 mm or more, pipe thickness 6.6 mm wall having coupler arrangement at one side or flexible pipe of same dia, 400-meter length may be used for above work. The work is to be executed at various locations and will be of different length

After completion of boring and cable insertion, contractor has to places cable route marker at and interval of 20-meter length the route marker shall be of heavy duty HDPE plate width red radium colour. The work includes complete labour and materials and to entire satisfaction of Engineer-in-charge.

c) This includes laying/ Fixing of bunch of cable of size 4 core, 16 to 70 Sq. mm LT armoured aluminum Conductor XLPE Cable of 1.1KV Grade through existing octagonal pole by inserting flexible pipe of hard PVC of size 50 mm two length from ground level to junction box fixing with heavy duty cable tie. This also includes necessary cable termination at the Street Light Pole with required material as directed by Engineer in charge.

d) This includes Fixing of LT/HT cable on existing cable tray along with GI binding wire at one meter distance. The work includes complete labour and materials and to entire satisfaction of Engineer-in-charge.

e)This includes Supply and Fixing of GI Perforated Cable Tray of size 300mm width X 2mm thickness X 3m long length & 150mm deep with its accessories and same shall be installed with proper space supports on the existing RCC wall with proper anchor bolt. Laying of cables 1.1 KV grade, size upto 4 core X 120sqmm as per site requirement LT armoured aluminum Conductor LT cable through cable tray. The cable laid on the existing cable tray shall be properly dressed in such a manner that the crossing of cables shall be minimized. The cable in the cable tray shall be clamped with suitable clamps/thick PVC straps at every 1 m distance in cable tray. The rates shall be inclusive of all material, required tools tackles and labour and as directed by Engineer-In-charge. The Cable Tray will be inspected at site and if damage to galvanization is noticed or the thickness of any section with inadequate thickness of galvanization is noticed the same will have to be replaced to new one to the satisfaction of the DPA or Third Party Inspection agency. Site galvanization or site repairs will not be permitted. All materials pertain to cable shall be hot dipped, such as its hardwares ,connector inner,outer,bend extender etc components shall function and work properly against deterioration due to the aggressive climate conditions.

The Cable Tray manufacturing & galvanizing unit shall be ISO 9001: 2000 & ISO 14001 certified to ensure consistent quality & environmental protection.

The contractor shall take prior approval of drawing from Engineer in-Charge before undertaking manufacturing of cable tray. The rate shall be inclusive of all the taxes (excluding GST), insurance, packing, forwarding, transportation, unloading at site as directed by Engineer-in-Charge.

This also includes necessary cable termination at the Street Light Pole with required material as directed by Engineer in charge.

Technical Specification No. 8

The item includes Supply and fixing Double Pole Structure without 11kv A.B. Switch & DO Fuse on 9 metre RSJ pole. The Distribution panel is to be fitted at least 3 mt form the ground level on proper size and length of M. S Channel /Angle on top & bottom also the earthing should be provided to the Distribution panel, however location may get changed as per site

situation.

SR	PARTICULARS	UNIT	QTY
1	RSJ pole 9 mtr (working load 200Kg)	NO.	2.00
2	M.S. Angle Top FEBRI.65x65x6mm - 3000mm	No	2.00
3	M.S. Angle Bottom FEBRI.65x65x6mm - 3000mm	No	4.00
4	M.S. Angle Fabri. 65x65x6mm - 3000mm for cross bracing	No	4.00
5	(a) Ancher rod - 1 No.	NO.	4.00
6	(b) Turn buckle - 1 No.	NO.	4.00
7	(c) Eye Bolt - 1No.(16mmX590 mm Round Bar).	NO.	4.00
8	(d) Stay wire- 7/12	KG	13.60
9	(e) LT Guy Insulator - 1 No.	NO.	4.00
10	(f) Guy Clamp - 1 Set.	SET	4.00
11	(a) GI Wire No. 8 From Pole Top to Earthing Coil	KG	2.72
12	(b) Rigid PVC Pipe -20mm dia (1.5 Mtr) - 1No	NO.	2.00
13	(c) Earthing Bolt	NO	2.00
14	(d) Earthing Coil (GI Wire No 8)	NO	2.00
15	(e) Alu. Binding wire	KG	0.50
16	(f) Barbed wire as per requirement		

The Contractor has to supply and to install the same at the site as directed by Engineer in charge which also include cement concreting of ratio (1:2:4) by proper excavation and insertion of Pole complete with labour and material and same should be in proper alignment and same shall be approved from Civil Department, DPA by Contractor. Thereafter, two coat of metal primer and three coat of silver paint is to be applied on its ancillary items, barbered wire should be wound on the pole from ground level to 2.5 to 3 metre height similarly danger plate and associated items required to complete the work will be in scope of contractor. The work is to be carried out as per Indian Electricity Rules and as per norms of PGVCL/GETCO. However, fabricated M.S fencing duly painted shall be provided around such switches.

Technical Specification No. 9

This includes supply at site, installation, testing and commissioning of Outdoor mounted type MS type Feeder pillar panel double shutter, handle with locking arrangement, dust, damp and vermin proof. The feeder pillar shall be fabricated from 3mm thick M. S sheet outer frame using suitable size of M.S angle and M.S Flat for the frame structure the inner sheet and the door should be made from 1.8 mm thick M.S sheet. The feeder pillar shall be painted using light grey Epoxy paint along with Danger indication sticker of voltages.

The feeder pillar shall be specious for easy maintenance and shall be specious to be provided with all the material mentioned below.

1. 200Amps, 415 V 50 Hz Volt AC four pole manual operated Change over Switch 1 No.
2. 100 A, 415 volt 4 pole MCCB C curve for outgoing cable 4 Nos.
3. Indicating lamp Red, yellow & blue 230/240v AC, with in built resistance 1 set.
4. DIN mounted astronomical timer Switch 2 Nos.
5. 3 phase 4 pole heavy duty Contractor suitable for 150A (Load Current) 2 Nos.

6. Heavy duty connector upto 120sqmm 1 set.
7. Multifunction Meter 1 No.
8. Suitable size of Aluminium bus bar for Phase & Neutral, PVC sleeved with colour code. Danger Board, tie belt etc.

All these components shall be mounted in the feeder pillar by means of suitable cadmium passivated hardware. The feeder pillar 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 feeder pillar shall be erected on MS angle of size 50x50x6mm with suitable height duly epoxy painted. The panel shall be fitted with proper GI bolt & nut on the so that it shall withstand the load of the panel properly.

The feeder pillar shall be tested as per latest IS Norms. The feeder pillar shall be provided with 2 Nos. terminals for earthing. The Panel shall be manufactured from type test holder having type test certificate of feeder panel of similar or above ratings. The above panel drawing should have to be approved by Engineer-in-charge before placing the order showing the position of the components as mentioned This includes all labour and material as directed by Engineer-in-charge.

Technical Specification No. 10

This includes preparation of Pole earthing with GI earth pipe 40mm internal dia, 3 mm pipe thickness (No minus tolerance allowed) and 1.5-meter-long of standard quality class – B. The pipe should be provided with 10mm holes in diagonally opposite directions throughout the length of the pipe at 150mm intervals centre to centre. The connection between the earthing stud inside pole and the earthing Pipe shall be done with two runs of 8 SWG GI wire with necessary clamps and nut bolts. The work includes all labour and material as directed by Engineer-in-charge.

Technical Specification No. 11

This includes preparation of earth station with G.I. Earth plate 600mm x 600mm x 10mm thickness and shall be buried in such a way that its top edge is at a depth of not less than 1.5 Meter from the surface of ground. It shall have a G.I pipe (Class-B) for watering of size 20mm dia. buried vertically and adjacent to plate electrode and other end shall be provided with funnel. The two runs of G.I. flat of size 50mm x 6mm thick shall be clamped near funnel and to be taken from main earth plate. The value of earth pit shall be less than 5Ω.

A cement concrete (ratio 1:4:8) chamber of at least 30 cm x 30 cm shall be provided just below the surface of ground over the funnel for watering and having RCC/CI cover of suitable size as directed. The pit shall be filled with alternative layer of 15cm each of charcoal and salt. This also includes removal of extra-excavated earth from the site.

This also includes two runs of G.I. flat strip of size 50mm x 6mm thick shall be connected from earth pit to Street Light Feeder Pillar as directed by Engineer-in-charge. This work includes all labour and material. The work shall be carried out to entire satisfaction of Engineer-in- charge.

Technical Specification No. 12

The contractor has to arrange reclamation materials as per govt norms, such as coarse graded material spreading and compating with hand roller. Material shall be of grade one size 75mm to 0.075 mm having CBR value 30, for low laying area to maintain proper leveling before laying of cable/ fixing of pole. The work is to be executed at various locations and will be of different area. Thereafter cable insertion, cable laying will be done, contractor has to places cable route marker at and interval of 30-meter length the route marker shall be of cement concrete duly red painted . The work includes complete labour and materials and to entire satisfaction of Engineer-in-charge and under the supervision and approval of Civil Department, DPA.

Technical Specification No. 13

Supply of 11KV HT 3C X 150 sqmm insulated armored XLPE Aluminum conductor.

The work includes Supply at site 3CX150 Sq. mm 11kV HT XLPE insulated, aluminum conductor armored cable as per IS 7098 (P-I) 1985 or latest, in this regard contractor shall submit the relevant documents before supplying the cable, contractor shall take make approval from Engineer-In-Charge. However, the cable make is mentioned in the approved make list of DPA. During the supply of the cable, firm shall produce the Type Test, Routine Test certificate at site. Unless otherwise specified, the cable shall conform in all respect to IS: 7098 (Part-II)-1985 with latest amendment thereof. 11 KV (E) Grade XLPE, 3-Core, power cable shall be of high conductivity, stranded compacted, H.D. aluminum circular shaped conductor with XLPE (cross linked Poly Ethelene) provided with shielding of extruded semi-conducting materials over conductor and XLPE insulation. Each insulated core shall have copper tape screen, laid together and provided with common covering of PVC Inner Sheath (Extruded). Overall galvanized steel strip armour and PVC outer sheath shall be provided. The specification for manufacture of cable shall be conforming to IS: 7098 (Part-II) 1985 (latest edition) for 11KV (E), 3-phase, 50 Hz. Earthed systems.

Outer sheath shall be designed to afford high degree of mechanical protection and shall also be heat, oil, chemical and weather resistant, Common acid, alkalis and sealing solution shall not have adverse effect on material of PVC sheath. Cable shall be suitable for laying in covered trenches or FRP cable trays or buried under- ground in outdoor or as directed by Engineer-In-Charge. The cable conductor shall be made from high conductivity stranded High Density aluminum to form compacted circular shaped conductor having resistance within limits specified in IS: 8130/1984 and any latest amendment to it. The conductor having semi-conducing screen shall ensure perfectly smooth profile & avoid concentration of stress. The conductor screen shall be extruded in the same operation as the insulation. The semiconducting polymer shall be cross linked.

The insulation shall withstand mechanical and thermal stress under steady state and transient operating conditions. The extrusion method should give very smooth interface between semi-conducting screen and insulation. The insulation of the cable shall be of high standard quality generally conforming to IS: 7098 (Part – II) – 1985 and any latest amendment to it.

Cable Parameters :

			11 KV
(i)	Voltage grade (Uo / U) KV	:	6.35 / 11
(ii)	Cores (Nos)	:	3
(iii)	Nominal system voltage KV	:	11
(iv)	Highest system voltage KV	:	12
(v)	System frequency Hz	:	50
(vi)	Variation in frequency %	:	± 3
(vii)	(a) Maximum allowable temp. of conductor during continuous normal operation at rated full load current. ^{0}C	:	90
	(b) Maximum allowable temp. under short circuit condition ^{0}C		250
(viii)	1.2/50 microsecond lightning impulse withstand voltage wave value. KVp	:	75
(ix)	5 Min, Power frequency withstand voltage KV rms	:	17
(x)	System earthling		Effectively Earthed

Non-metallic semi-conducting shield shall be provided over the insulation to confine electrical field to the insulation. The insulation shield shall be extruded in the same operation as the conductor shield and the insulation by suitable extrusion process. The XLPE insulation shield shall be of tended type. The copper metallic overlapped tape shield shall be provided.

Fillers and Inner-sheath should be confirming to IS: 7098(Part-II)-1985. The sheath shall be suitable to withstand the site conditions and the desired temperature. It shall be of consistent quality and free from all defects. The PVC sheath shall be extruded. The material of fillers and inner-sheath shall be compatible with the temperature ratings of the cable and shall have no deleterious effect on any other component of the cable. Central filler shall also, be provided with other peripheral fillers to have proper circular section.

Armouring of galvanized steel strip shall be provided. The dimensions of steel strips shall be as per latest edition of IS: 3975 – 1979.

Extruded type ST-2 PVC outer-sheath, conforming to IS: 5831-(1984) (latest edition) over armouring with suitable additives (to prevent attack by redents & termites), shall be provided.

The cable shall have suitable fillers laid up with insulation cores to have subsequently circular cross-section before the inner sheath is applied. The fillers shall be suitable for operating temperature of the cable.

All materials used in manufacturing of cable shall be new, unused and of finest quality. All materials should comply with the requirements / tests as per applicable IS / IEC specification, Indian Electricity Rules and any other statutory provision of rules & regulations. The PVC material used in the manufacture of cable shall be of reputed manufacturer. No recycling of PVC is permitted.

The purchaser reserves the right to ask for documentary evidence of the purchase of various materials, (to be used for the manufacture of cable) as per checking of quality control. Quality Assurance plans shall be submitted. The indicative values of continuous current carrying capacities a t Maximum conductor temperature of 90°C (for design purpose by field) of 3 core 185 sq.mm cable, Continuous Current Carrying

Capacity (For 11 KV c a b l e) 270A in Ground and 310A in air. Short circuit rating for 185sqmm Conductor should be 17.4 kA (rms).

The current rating shall be based on maximum conductor temperature of 90 degrees with ambient site condition specified for continuous operation at the rated current. Cable shall be suitable for operation under frequency variation of +3% and voltage variation of +10% to -15% and combined frequency - voltage variation of 10% (absolute sum).

The bidder shall have to submit, well in advance, the test certificates for the following routine test for approval prior to inspection of the materials for the complete lot offered for inspection at a time. (a) Conductor resistance test (b) Partial discharge test (c) High-voltage test for 5 minutes [as per Clause 19.7.2 of IS: 7098 (Part-II) – 1985]. DPT reserves the right to insist for witnessing the acceptance / routing tests of the bought out items.

Technical Specification No. 14
Laying in Hard/Soft Soil for 11KV HT 3C X 150sqmm XLPE Aluminum conductor.

Laying of 3CX150 Sq.mm (E) XLPE Cable through Hard/Soft Soil Excavation and laying through Half Round Pipe (2 Nos.) 6" inner Diameter and 1 Meter length.

The work includes laying of 3Cx150sqmm underground cable. For any length of cable that extends beyond the standard drum length of the cable, such extension must be done with proper cable joining kits and techniques as per latest IE standards with excellent workmanship. All the cable ends that terminate at pole structures should be brought out from the ground only in HDPE pipes of appropriate size carrying single individual cable inside each HDPE pipe. The cable end should be terminated as per standard practice as per IE rules with best workmanship. Tagging of the cables with precise nomenclature is mandatory.

The vegetation on the way of laying the cable shall be removed by the contractor. The contractor shall prepare the drawing of the line work (5 copies) and shall submit all the required documents which are required for getting clearance from CEA. However, the submission, uploading of documents and payment of statutory charges are in the scope of DPT. The relay co-ordination is in the scope of contractor

This includes laying of double circuit 3 core x 150 Sq.mm HT armored aluminum Conductor XLPE Cable of 11KV Grade (excluding supply of cable) through excavation of trench 0.75 meter wide and 1 meter deep in soft/hard soil. Each cable should be placed inside RCC Half Round Pipe of 6" inner Dia and 1 Meter length and such RCC Half Round Pipes must be placed in such a fashion soas to provide support under the cable with one half and covering over the cable with the other half. The same trench would be used to place two circuits (cables) side by side in horizontal fashion and these cables would run through two RCC pipes individually. The minimum distance between such RCC pipes throughout the route length should be 0.3m.

The bed of 50mm of river sand shall be provided in the bottom of the excavated trench. The RCC Pipe shall be laid over the bed of river sand. This includes filling of gaps by fresh river sand and filling the trench up to at least 400mm height from bottom by fresh river sand. The remaining filling of the trench shall be done with the excavated stuff & should be watered and rammed properly to its original position. The excess excavated stuff shall be disposed off from the Site of work and spread in low lying areas as directed by Engineer in Charge or his nominee. The contractor shall provide heat shrinkable straight through joints of relevant size of approved make if the laying of cable shall be more than standard drum length. This includes all labour and material as directed by Engineer-in-Charge. Such cable joints shall be under the scope of work of the contractor at no extra cost or obligation from DPT. Such cable joining work is completely to be done by the contractor at his own cost.

Permanent means of indicating the positions of joints on site should be provided. During the course

of permanent reinstatement cable and joint markers, should be laid directly above the route of the cable and the position of the joint respectively.

Wherever it is not possible to place the marker directly over the cable route or joint the marker should be suitably placed near the cable route or joint on which the distance of the cable route or joint at right angles to and parallel to the marker should be clearly indicated.

The site requirement & position of fixing the markers will be decided by the Engineer-In-charge or his nominee.

The type of route marker & letters to be written on the route marker will be decided while execution by the Engineer-in-charge.

Route marker should be visible and the pedestal should be buried underneath the ground firmly by providing CC foundation.

Route Marker of C.C. (1:2:4) 150x150x750 (in mm) Concrete Stone (DPT Mark with Approved Yellow Color Embedded in Earth at least 300 mm below the ground Level at Approx. Distance 10 Meter or as directed by EIC

Cable laying, shall include the route marker, cable tagging, dressing, removing the old unused cable from the RCC Trench, appropriate size of glands & ferrule work as per requirement etc.

Technical Specification No. 15

Laying for Railway/Road Crossing/RCC through HDD Single length 11KV HT 3C X 150sqmm XLPE Aluminum conductor.

This includes Laying 3 core x 150 Sq.mm 11kV XLPE cable by putting suitable diameter HDPE pipe, through road/Rail/RCC crossing as per railway norms. If the Road/RCC crossing length more than length of HDPE seamless pipe, then the firm shall had to lay coil type HDPE pipes and make a strong and trouble free connection so that pushing and pulling of cable within such pipes is unaffected and fuss free & then lay across the Rail/Road crossing. Single cable shall be passed through one pipe, the excavated stuff shall be disposed off from the Site of work and spread in low laying area. In case of Rail Crossing, firm shall put earthing across rail track, both end, their own cost as per IE rule & act. The HDPE pipe should be laid using Horizontal Boring using Horizontal auguring machine for all the Road/Railway/RCC crossings. Cable lying, which shall include the route marker, cable tagging, dressing, removing the old unused cable from the RCC Trench, appropriate size of glands & ferrule work as per requirement etc. The entire work including follow up action with various authorities shall be in the scope of contractor. However, the statutory payment will be made by DPA.After completion work Concrete stone with red colour is to be fixed on the route stating the cable beneath the ground.

Technical Specification No. 16

Servicing of Existing 11KV, 800A to 1250A, HT VCB Panel by current injection, wiring healthiness, CT/PT testing and mechanical cleaning and electrical testing in all respects.

The Existing HT VCB Panel which is installed at 15th CB Substation.
Charges towards:

(1) Relay Testing.
(2) VCB Insulation Resistance Test.
(3) PT Resistance and Insulation Resistance Test.
(4) Tripping Circuit and closing check.

(5) Protection healthy check of HT Panel.
(6) Contact Resistance Measurement.
(7) RYB Identification of all buses with heat shrink sleeve.
(8) Epoxy Insulator to be replace if found weak insulation.
(9) Tripping Coil, Closing Coil to be replaced with new one if not working.
(10) Replacement of PT & its fuse if not working.
(11) Earth Pit value to be checked if found weak same is to be rectify.

- After completion of above testing contractor had to supply and lay/fix the below items in substation i.e.: 11 KV Rubber Mats (3 Mtr X 1 Mtr), 6Nos, 11KV duly tested hand gloves 2set, First Aid Box 1 with all medicines kit, Shock treatment chart duly framed 2Nos should provide as directed. And breaker Incoming & outgoing name shall be painted on its door complete with labour & materials, This includes all labour and material as directed by Engineer-in-Charge.

Technical Specification No. 17

Supply, fixing and testing of Indoor Cable Termination kit for 11kV 150sqmm XLPE Cable.

This includes providing & making indoor/Outdoor end Termination kit on HT (11 KV) 3CX150 Sq.mm (E) cable at both end for all three phases, HT Joint shall be carried out by certified jointer. This work includes all labour and material as directed by Engineer-in-Charge. The Heat Shrinkable Indoor Termination offered shall be complete with all parts necessary for their effective and trouble-free operation. Such parts will be deemed to be within the scope of the supply irrespective of whether they are specifically indicated. It is not the intent to specify herein complete details of design and construction of Heat Shrinkable Indoor Termination.

The Heat Shrinkable Indoor Termination offered shall conform to the relevant standards and be of high quality, sturdy, robust and of good design and workmanship complete in all respects and capable to perform continuous and satisfactory operations in the actual service conditions at site and shall have sufficiently long life in service as per statutory requirements. The Heat Shrinkable Indoor Termination offered shall be reliable, fast and easy-to install jointing termination system to assure and maintain high network reliability in the most severe conditions and under high electrical, thermal, mechanical and environmental stress.

The design, manufacture and performance of the Heat Shrinkable Indoor Termination shall comply with all currently applicable statutes, regulations and safety codes. Nothing in this specification shall be construed to relieve the bidder off his responsibilities. Unless otherwise specified, the Heat Shrinkable Indoor Termination offered shall conform to the latest applicable Indian, IEC, British, U.S.A. or International Standards and in particular. The Indoor cable termination is to be mandatorily used for 11kV 150sqmm XLPE cables termination. The cable termination at pole structures should be done as per standard practice of PGVCL. Applicable standards for Indoor Cable Termination Kit are as per latest follows and same relevant documents shall be submitted prior to supply also at the time of make approval from EIC, DPA.

Technical Specification No. 18

Supply, fixing and testing of Outdoor Cable Termination kit for 11kV 150sqmm XLPE Cable.

This includes providing & making Indoor/outdoor end Termination kit on HT (11 KV) 3CX150 Sq.mm (E) cable at both end for all three phases, HT Joint shall be carried out by certified jointer. This work includes all labour and material as directed by Engineer-in-Charge. The Heat Shrinkable Outdoor

Termination offered shall be complete with all parts necessary for their effective and trouble-free operation. Such parts will be deemed to be within the scope of the supply irrespective of whether they are specifically indicated. It is not the intent to specify herein complete details of design and construction of Heat Shrinkable Outdoor Termination.

The Heat Shrinkable Outdoor Termination offered shall conform to the relevant standards and be of high quality, sturdy, robust and of good design and workmanship complete in all respects and capable to perform continuous and satisfactory operations in the actual service conditions at site and shall have sufficiently long life in service as per statutory requirements. The Heat Shrinkable Outdoor Termination offered shall be reliable, fast and easy-to install jointing termination system to assure and maintain high network reliability in the most severe conditions and under high electrical, thermal, mechanical and environmental stress.

The design, manufacture and performance of the Heat Shrinkable Outdoor Termination shall comply with all currently applicable statutes, regulations and safety codes. Nothing in this specification shall be construed to relieve the bidder off his responsibilities. Unless otherwise specified, the Heat Shrinkable Indoor and Outdoor Termination offered shall conform to the latest applicable Indian, IEC, British, U.S.A. or International Standards and in particular. The outdoor cable termination is to be mandatorily used for 11kV 150sqmm XLPE cables termination. The cable termination at pole structures should be done with HDPE pipe of suitable diameter and as per standard practice of PGVCL. Each such HDPE pipe should contain only one cable. Applicable standards for Indoor Cable Termination Kit are as per latest follows and same relevant documents shall be submitted prior to supply also at the time of make approval from EIC, DPA.

Technical Specification No. 19.

Supply, fixing and testing of Straight Joint Cable Termination kit for 11KV 150 sqmm XLPE Cable.

This includes supply of heat shrink straight through Termination kit on HT (11 KV) 3CX150 Sq.mm (E) cable the rate shall be inclusive of all taxes, including transportation loading & unloading at site the jointing lit shall be of fresh batch of 2024-25, making outdoor straight joint Termination kit on HT (11 KV) 3CX150Sq.mm (E) cable, HT Joint shall be carried out precisely with good workmanship work includes all labour and material as directed by Engineer-in-Charge. The Heat Shrinkable Straight Joint Termination offered shall be complete with all parts necessary for their effective and trouble-free operation. The Heat Shrinkable Outdoor Termination offered shall conform to the relevant standards and be of high quality, sturdy, robust and of good design and workmanship complete in all respects and capable to perform continuous and satisfactory operations in the actual service conditions at site and shall have sufficiently long life in service asper statutory requirements. The Heat Shrinkable Outdoor Termination offered

The Straight joint cable termination is to be mandatorily used for 11kV 150 sqmm XLPE cables termination. The cable termination at pole structures should be done with HDPE pipe of suitable diameter and as per standard practice of PGVCL. Each such HDPE pipe should contain only one cable.

Technical Specification No. 20.

This includes supply at site, installation, testing and commissioning of Outdoor mounted type MS type Feeder pillar panel double shutter, handle with locking arrangement, dust, damp and vermin proof. The feeder pillar shall be fabricated from 3mm thick M. S sheet outer frame using suitable size of M.S angle and M.S Flat for the frame structure the inner sheet and the door should be made from 1.8 mm thick M.S sheet. The feeder pillar shall be painted using light grey Epoxy paint along with Danger indication sticker of voltages.

The feeder pillar shall be specious for easy maintenance and shall be specious to be provided with all the material mentioned below.

9. 200Amps, 415 V 50 Hz Volt AC four pole manual operated Change over Switch 1 No.
10. 100 A, 415 volt 4 pole MCCB C curve for outgoing cable 4 Nos.
11. Indicating lamp Red, yellow & blue 230/240v AC, with in built resistance 1 set.
12. DIN mounted astronomical timer Switch 2 Nos.
13. 3 phase 4 pole heavy duty Contractor suitable for 150A (Load Current) 2 Nos.
14. Heavy duty connector upto 120sqmm 1 set.
15. Multifunction Meter 1 No.
16. Suitable size of Aluminium bus bar for Phase & Neutral, PVC sleeved with colour code. Danger Board, tie belt etc.

All these components shall be mounted in the feeder pillar by means of suitable cadmium passivated hardware. The feeder pillar 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 feeder pillar shall be erected on MS angle of size 50x50x6mm with suitable height duly epoxy painted. The panel shall be fitted with proper GI bolt & nut on the so that it shall withstand the load of the panel properly.

Technical Specification No. 21.

Supply, Installation, Testing and Commissioning of outdoor type 100kVA 11/0.43kV Oil immersed Transformer.

Supply, Installation, Testing and Commissioning of Outdoor Type Pole mounted Transformer of 11kV/415 Volts, equipped with 100kVA Oil filled Type Transformer, All the components shall comply with their relevant IS/IEC standards. This includes all labour and material as directed by Engineer-in- Charge.

S.No	Item	11 kV Distribution Transformers
1	Rated KVA (ONAN rating)	100KVA
2	Rated voltage HV	11 kV
3	Rated voltage LV	430-250 V
4	Frequency	50 Hz +/- 3%
5	No. of Phases	Three
6	Connection HV	Delta

7	Connection LV	Star (Neutral brought out)
8	Vector group	Dyn-11
9	Type of cooling	ONAN
10	Cooling medium	Insulating oil IS:335-2018
11	No of windings	2
12	System earthing	Neutral of LV side to be solidly earthed
13	%ge impedance at normal tap at 75^0 C	As per Standards
14	Neutral terminal to be brought out	On LV side
15	Max flux density in any part of the core or yoke at rated voltage and frequency with +12.5% combined voltage and frequency	As per Standards
16	Permissible temperature rise over ambient temperature of 50^0 C	
i)	Of top oil measured by thermometer	As per Standards
ii)	Of winding measured by resistance	As per Standards
17	Mini HV clearance in mm	
i)	Phase to phase	As per Standards
ii)	Phase to ground	As per Standards
18	Mini LV clearance in mm	
i)	Phase to phase	As per Standards
ii)	Phase to ground	As per Standards
19	Bushings and terminals	As per IS 3347 and IS 7421
i)	HV bushings	12KV rating oil filled porcelain type
ii)	Creepage distance	25mm/kv
iii)	LV bushings	1.0KV rating oil filled porcelain type
20	Material of HV and LV conductor	Aluminium
21	Max current density for HV and LV winding for rated current	As per Standards
22	Insulation level of windings	
i)	Basic Impulse level (BIL)	75KVP
ii)	Power frequency voltage withstand	
a)	HV winding	28KVrms
b)	LV winding	03KVrms
23	Bushing stem for 100 KVA with nuts	
ii)	HV side	standard
iii)	LV side	standard

Technical Specification No. 22:

This item includes preparation of maintenance free earth station by providing 80mm diameter, 3 meter, 250 micron Hot dip Galvanised bonded chemical electrode with back fill compound including accessories & masonry work. A cement concrete (ratio 1:4:8) chamber of at least 500 mm × 500 mm × 500mm × 50mm (thickness of wall) shall be prepared and a cover of suitable size shall be provided for the chamber. The work shall be carried out to entire satisfaction of Engineer in-Charge. This work includes all material, labour, tools & tackles as directed by Engineer in-Charge.

Technical Specification No. 23:

This item includes supply at site, laying, fixing and connecting of Hot dip GI strip of size 50×5 mm from earth station to Distribution Transformer as directed. The GI strip shall be laid from earth station to Distribution and shall be clamped suitably on wall/floor or buried in the ground/ trench as directed. This work includes all material, labour, tools & tackles as directed by Engineer in Charge.

Technical Specification No. 24:

This includes providing of protection guard fencing to high mast consisting of suitable size of MS angle of not less than 75 x 75 x 10 mm and including cross bracing angle of size not less than 50 x 50 x 6 mm. The height of fencing shall be not less than1.5 m from the ground level. The foundation of the angles shall be provided with cement concreting including providing muffing not less than 45 cm above the ground level. The work shall be carried out to the entire satisfaction of Engineer in charge. The vertical main members of the guarding shall be cement concreted to depth of 0.45m below the ground level. All the members of guard fencing shall be pretreated and then painted with two coats of primer and two coats of finish paint. The protection guard shall be designed and approved by Engineer-In-Charge prior to manufacturing and execution of work. The protected area surrounding the highmast shall not be less than 4.5 m x 4.5 m. This work includes all material, labour, tools & tackles as directed by Engineer In-Charge.

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Signature & Seal of Firm

Executive Engineer (E)

Deendayal Port Authority

Approved Make List for Electrical Items

Sr. No.	Description	Recommended Makes
1	HT VCB	SIEMENS / CROMPTON GREAVES/ABB/Schneider/JYOTI
1(a)	HV Gas Insulated Breakers	SIEMENS /Schneider/ABB
2	POWER TRANSFORMERS	VOLTAMP/CROMPTON GREAVES /BHARAT BIJLEE/ BHEL/ SIEMENS/ ABB/ Schneider/T&R
3	DISTRIBUTION TRANSFORMERS	EMCO/KIRLOSKAR/PATSON/VOLTAMP/ ABB / Schneider / T&R
4	RESIN CAST TRANSFORMERS	
	A) RESIN CAST IMPREGNATED	VOLTAMP / KIRLOSKAR / EMCO
	B) DRY CAST	VOLTAMP/KIRLOSKAR/EMCO
5	HT XLPE CABLES	POLYCAB/TORRENT/RPG ASIAN/ /GLOSTER/ UNISTAR/ UNISTAR/KEI/FINOLEX/HAVELS
6	LT XLPE CABLES	POLYCAB/TORRENT/RPG ASIAN/ / RALLISON/PRIMECAB/ HAVELLS/ UNISTAR/AVOCAB / ADCAB
7	LT ACB	SIEMENS/L&T/SCHNEIDER/C&S
8	PROTECTION RELAYS	AREVA/L&T/SIEMENS/ABB/C&S
9	LT PANEL	CPRI APPROVED
10	CHANGE OVER SWITCH	SIEMENS/L&T/ABB/C&S/SCHNIDER/ LEGRAND / INDOASIAN
11	SFU FOR MAIN LT DISTRIBUTION PANELS	SIEMENS/L&T/ABB/C&S
12	SFU FOR DISTRIBUTION PANELS & FEEDER PILLERS	SIEMENS/L&T/ABB/C&S/ SCHNEIDER/ LEGRAND/ INDOASIAN/HAVELLS
13	MCCB FOR MAIN LT DISTRIBUTION PANELS	SIEMENS/L&T/ABB
14	MCCB FOR DISTRIBUTION PANELS AND FEEDER PILLERS	SIEMENS/L&T/ABB/C&S/ SCHNIDER/ LEGRAND/ INDOASIAN/HAVELLS
15	MCB/ELCB/RCCB/ RCCBO FOR MAIN LT DISTRIBUTION PANELS	SIEMENS/HAGER L&T/ABB
16	MCB FOR DISTRIBUTION PANELS AND FEEDER PILLERS	SIEMENS/L&T/ABB/C&S/ SCHNEIDER/ LEGRAND/ INDOASIAN/ HAVELLS/ STANDARD
17	MCB DISTRIBUTION BOARD	STANDARD / HENSEL/LEGRAND / INDOASIAN / HAVELLS
18	MULTI FUNCTION DIGITAL METER FOR MAIN LT DISTRIBUTION PANELS/DIGITAL KWH METERS/ABT METER	L&T/ENERCON/SECURE/L&G/ RISHABH or APPROVED BY PGVCL Make.
19	ANALOG VOLT/AMPARE METER	RISHABH/AE/ENERCON/L&T

	FOR DISTRIBUTION PANELS AND FEEDER PILLERS	
20	SLECTOR SWITCH FOR VOLTMETER/AMPARE METER	L&T/SIEMENS/C&S
21	POWER CONTACTOR & OVER LOAD RELAYS	L&T/SIEMENS/ABB
22	QUARTZ TIME CLOCK SWITCH	L&T/INDOASIAN/SIEMENS
23	PVC WIRE WITH COPPER CONDUCTOR	RR KABEL / KEI / POLYCAB/MILEX/GUJCAB/ STANDARD / FINOLEX / ANCHOR
24	FLUSH TYPE SWITCHES, SOCKETS, HOLDERS AND CEILING ROSES & ELECTRONIC REGULATORS	ANCHOR/MK/NORTHWEST/VINAY /PANAMA / HAVELLS
25	DOOR BELLS/CALL BELLS	ANCHOR/LEGEND/MK/NORTHWEST
26	MODULAR SWITCHES, SOCKETS, PLATES & BOXES	ANCHOR / MK / NORTHWEST / LEGRAND /HAVELLs / INDOASIAN / SIMENS.
27	PVC CONDUIT/OVAL CONDUIT & CASSING CAPPING AND ACCESSORIES	PRECISION/VULCAN/FINOLEX/ GARWARE/ RESTOPLAST/ SWASTIK / BPI
28	GLS LAMPS & FLUORESCENT LAMPS	PHILIPS / BAJAJ / WIPRO / CROMPTON GREAVES / OSRAM / SURYA ROSHNI / GE
29	HPSV, HPMV & METAL HELIDE LAMPS	PHILIPS / BAJAJ / WIPRO / CROMPTON GREAVES / OSRAM / SURYA ROSHNI / GE
30	IGNITORS FOR HPSV, METAL HELIDE LAMPS	PHILIPS / BAJAJ / WIPRO / CROMPTON GREAVES / OSRAM / SURYA ROSHNI / GE
31	LUMINARIES	PHILIPS / BAJAJ / WIPRO / CROMPTON GREAVES / OSRAM / SURYA ROSHNI / GE/C&S
31a	LED LUMINARIES	Philips /Bajaj/Wipro/CG/Surya/Pyrotech/Syska/Nessa/C&S having surge Protection ≥10KV for fittings & internal Surge Protection for Driver of≥4KV, LED Chip only OSRAM/CREE/Philips Lumileds/Citizen/ with LM-79,80 CERTIFICATION
32	CEILING FANS	BAJAJ/ORIENT/USHA/CROMPTON GREAVES / ALMONARD/GEC
33	WALL MOUNTING FANS	BAJAJ/ORIENT/USHA/CROMPTON GREAVES / ALMONARD/GEC
34	EXHUAST FANS	BAJAJ/ORIENT/USHA/CROMPTON GREAVES / ALMONARD/GEC
35	HEAVY DUTY INDUSTRIAL WALL MOUNTING FANS	BAJAJ/ORIENT/USHA/CROMPTON GREAVES / ALMONARD/GEC or its equivalent
36	WATER COOLER	VOLTAS/SHRIRAM USHA/BLUE STAR
37	AIR CONDITIONERS	VOLTAS/CARRIER/BLUESTAR/USHA/ HITACHI/LG/ SAMSUNG/ONIDA
38	REFRIGERATORS	VOLTAS / CARRIER / BLUESTAR / USHA / HITACHI / LG / SAMSUNG / WHIRLPOOL

39	VOLTAGE STABILIZER	VEELINE / CAPRI
40	INVERTERS	SUKAM / MICROTEK
41	D.G. SETS	
	A) ENGINE	CUMMINS/GREAVES/KIRLOSKAR/ CATERPILLAR /ASHOK LEYLAND /VOLVO
	B) ALTERNATOR	STAMFORD/CROMPTON GREAVES /JYOTI/ KIRLOSKAR ELECTRIC
42	ELECTRIC MOTOR	ALSTOM/CROMPTON GREAVES /SIEMENS/ KIRLOSKAR/ABB
43	WATER PUMPS	SWASTIK / KSB
44	WATER GEYSER	BAJAJ/USHA / CROMPTON GREAVES / SPHEREHOT / RACOLD
45	LUGS & CABLE GLANDS	DOWELLS / JAINSON / BRACO

Note:
In case of supply of Make of material which is not in the DPA approved Make list, the said material should be supplied as per the latest GETCO approved Make list.

In case of supply of Make of material which is neither available in the DPA approved Make list not in the latest GETCO approved Make list, the said material should be supplied as per the Make decided by EIC for which written intimation will be given to the contractor.

Before procurement of material, the Make of the material should be approved by EIC in writing.

-/sd

Signature & Seal of Firm

Executive Engineer (E)

Deendayal Port Authority

TERMS AND CONDITIONS

(1) Time Schedule: The work shall be completed within 180 days from the date of issue of Work Order.

(2) The bidder, at his own responsibility and risk is encouraged to visit and examine the site of work and its surroundings and obtain all information that may be necessary for preparing the Bid. The costs of visiting the site shall be at the Bidders' own expense.

(3) DPA will award the work to the bidder whose bid has been evaluated to be techno – commercially responsive and the lowest valuated amount bid.

(4) Work shall be guaranteed for 12 months from the date of completion of the work.

(5) The rates should be quoted in figures and words both. In case of difference in figure & words, the rate mentioned in words will be considered.

(6) The contractor shall affix SEAL along with SIGNATURE in the Offer.

(7) The work shall be carried out in accordance with the best standards of workmanship and to the entire satisfaction of the Engineer in-Charge.

(8) Security Deposit @ 5% recovered from the bill and the SD can be released only after successful completion of guarantee period.

(9) **Payments Terms**: All payments shall be made in Indian rupees unless specifically mentioned.

- 70% of supply item rate against receipt of material at site in good condition after obtaining insurance cover as per tender condition (if TPI appointed then after inspection & certification of the same by Third Party Inspection Agency).
- 20% of supply item rate after completion of erection, installation, testing and commissioning, etc. (if TPI appointed then after inspection & certification of the same by Third Party Inspection Agency)
- 90% of item rate covers only laying/fixing/installation.
- Remaining 10% will be released after successful completion of whole work (if TPI appointed then after inspection & certification of the same by Third Party Inspection Agency).

(10) Payment will be made by RTGS only after satisfactory completion of work and submission of duly signed bill.

(11) The contractor shall not deposit any materials at such a place that may cause inconvenience to the public or staff or near by offices.

(12) The Contractor shall execute the work in such a way that not to cause inconvenience to the public or staff or nearby offices and not to cause hindrance. Necessary barricading shall be done by

the contractor at his own cost if required.

(13) Income-tax and surcharge as applicable will be deducted from the bill while making payment to the contractor for carrying out the work and only net amount shall be paid to the contractor.

(14) All the materials should be got approved from Engineer-in-Charge before put in to use.

(15) All the rules and regulations governing DPA will be applicable.

(16) After completion of the work, the site should be neatly cleaned by the contractor.

(17) The contractor shall ensure not to cause any damages to the port properties in the vicinity of work site during execution of work. If any damage occurs due to workmen/machinery of the contractor, the contractor has to make good the loss / damage at hiscost.

(18) For Entry & exist of material and contractor personnel, pass shall be arranged by firm.

(19) The contractor shall quote the price exclusive of GST. The contractor shall quote prevailing GST rate separately, which shall be reimbursed by DPA after ascertainingnecessary compliance as per Goods & Service Tax, 2017. All other duties, taxes, cesses applicable if any, shall be borne by the contractor.

Income-Tax deductions and surcharge as applicable thereon shall be made good while making payments due to the contractor for carrying out the work and only net amount shall be paid as directed by the Central Board of Direct Taxes, Ministry of Finance, Government of India.

The rates quoted by the contractor shall be deemed to be inclusive of the taxes, duties etc. which the contractor will have to pay for the performance of this contract, exceptGST. The employer will perform such duties in regard to the deduction of such taxesat sources as per applicable law.

(20) All the work shall be carried out to the entire satisfaction of Engineer in-Charge.

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Signature & Seal of Contractor

Executive Engineer (E)

Deendayal Port Authority