DEENDAYAL PORT AUTHORITY

An ISO 9001 : 2008 & ISO 14001 : 2004 Certified Port

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

EL/AC-Budgetary Offer/2911 Date: 28/03/2026

"Budgetary Offer"

Sub: "Design, Manufacture, Supply, Installation, Testing & Commissioning of Smart Roadway Street Lighting System from KK Road to 8th Oil Jetty including Comprehensive Annual Maintenance Contract."

Executive Engineer (Electrical), DPA invites Budgetary Offers for the work of "Design, Manufacture, Supply, Installation, Testing & Commissioning of Smart Roadway Street Lighting System from KK Road to 8th Oil Jetty including Comprehensive Annual Maintenance Contract" from the firms from those who have executed similar work in Government / Public Sector and other leading private organizations as per Scope of Work and Technical Specifications enclosed herewith.

The interested firms are requested to submit their Budgetary Offers for the work in BOQ format enclosed herewith along with the completion certificate for the similar work to the office of the undersigned on or before 20/04/2026 through hard or soft copy. A soft copy of Budgetary Offer shall be submitted through e-mail Id cme@deendayalport.gov.in, and copy todeepak.hazra@deendayalport.gov.in.

Sd/-
Executive Engineer (E)
Deendayal Port Authority

BILL OF QUANTITIES

Sr. No.	Description	Qty.	Unit	Rate	Amount
1	Supply at site 10 Meter long galvanized octagonal street light pole with 1.5 Meter long detachable double Arm as per Technical Specification No. 1.	121	Nos.		
2	Erection of supplied 10 Meter long galvanized octagonal street light pole with 1.5 Meter long detachable double Arm along with civil foundation as per Technical Specification No. 2.	121	Nos.		
3	Supply at site 10 Meter long galvanized Octagonal street light pole with 1-meter single arm (5° inclination) with complete its accessories as per Technical Specification No. 1.	34	Nos.		
4	Erection of supplied 10 Meter long galvanized Octagonal street light pole with 1-meter single arm (5° inclination) with complete its accessories as per Technical Specification No. 2.	34	Nos.		
5	Supply of Energy Efficient 250W (±5%) LED Street Light luminary as per Technical Specification No. 3.	276	Nos.		
6	Fixing of 250W (±5%) LED Street Light Luminary with all accessories as per Technical Specification No. 4.	276	Nos.		
7	Supply, Installation, Testing & Commissioning of IoT Base smart feeder Pillar with all accessories as per Technical Specification No. 5. (a)Supply	05	Nos.		
	(b)Installation, Testing & Commissioning	05	Nos.		
8	Providing IoT, Dashboard, Software, Network & Cloud services for ILM & CCMS for 5 years as per Technical Specification No. 6.	01	No.		
9	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. 7. 4 Core, 16 Sq. mm 4 Core, 50 Sq. mm 4 Core, 70 Sq. mm 4 Core, 95 Sq. mm	 4500 2000 2000 2000	 Meter Meter Meter Meter		

10(a)	Laying of 4.0 Core LT armoured alluminium conductor XLPE cable of 1.1KV grade of the following type & size through excavation in soft/hard soil as per Technical Specification No. 08(a) i) Single length Up to 4.0 core x 95 Sq.mm	2500	Meter		
10(b)	Laying of 4.0 Core LT armoured alluminium conductor XLPE cable of 1.1 KV Grade of following type & size in half round RCC pipe of 6" internal dia. as per Technical Specification No. 08(b) i) Up to 4.0 core x 95 Sq. mm. in 6" half round pipe	2500	Meter		
10(c)	Laying of LT armoured aluminium conductor XLPE cable of 1.1 KV 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.08(c) i) Up to 4.0 core x 95 Sq. mm. through hori boring in suitable size HDPE pipe	500	Meter		
10(d)	Laying of LT armoured aluminium conductor XLPE cable of 1.1 KV grade of size up to 120 Sq. mm. through suitable size of HDPE heavy duty pipe as per Technical Specification No.08(d). i) Up to 4.0 core x 95 Sq. mm. through hori boring in suitable size HDPE pipe	500	Meter		
10(e)	Laying of 4 Core, 16 Sq. mm. LT armoured aluminium conductor XLPE cable of 1.1 KV grade existing octagonal pole by inserting flexible pipe of hard PVC of size 50 mm. two length from ground level to Termination Point fixing with heavy duty cable tie. as per Technical Specification No. 08(e) i) 4.0 Core x 16 Sq. mm. in flexible pipe of 50 mm. dia.	4500	Meter		
11	Reclamation to low laying area at various locations as per site conditions as per Technical Specification no. 09	1000	M^3		
12	Supply of 11KV HT 3C X 95 Sq. mm. insulated armored XLPE Aluminum conductor cable as per Technical Specification No. 10.	1000	Meter		

13	Laying in Hard/Soft Soil for 11KV HT 3C X 95 Sq. mm. XLPE Aluminum conductor as per Technical Specification No. 11	700	Meter		
14	Laying for Railway/Road Crossing/RCC through HDD Single length 11 KV HT 3C X 95 Sq. mm. XLPE Aluminum conductor as per Technical Specification No. 12	300	Meter		
15	Supply, fixing and testing of Outdoor Cable Termination Kit for 11 KV, 3C X 95 Sq. mm. XLPE Cable as per technical specification no.13 (A) Supply (B) Fixing, Testing & Commissioning	 3 3	 Nos. Nos.		
16	Supply, Installation, Testing and Commissioning of Double Pole Structure with D.O. Fuse on 11 Mtr. RCC/PSC pole of 200 Kg. complete with Labour and Material as per Technical Specification No. 14	3	Nos.		
17	Supply of Street Light Feeder Pillar fabricated from M. S. Steel as per Technical Specification No.15	3	Nos.		
18	Preparation of Feeder Pillar and Distribution Transformer earthing system with GI earth plate including required accessories and civil work as per Technical Specification No.16	12	Nos.		
19	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. 17	3	Nos.		
20	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.18 (a)Supply (b)Installation, Testing & Commissioning	 3 3	 Nos. Nos.		
21	Comprehensive Maintenance Contract for the entire system for 5 years after free warranty maintenance of 1 year from the date of completion of the capital work.	60	Month		

Total Amount (Excl. of GST)	

(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 Contractor

Sd/-
Executive Engineer (E)
Deendayal Port Authority

Scope of Work and Technical Specification

1.0 Scope of work

The scope of work envisages the following:

- Design, Manufacture, Supply, Installation, Testing & Commissioning of Road Lighting System as per the BoQ, Technical Specifications with all Labours, Materials, Transportations, Loading and un-loading etc. The work shall be carried out at Kandla and the Site shall be cleaned after completion of the work.
- The work shall be carried out strictly as per the IER and IEA.
- The Contractor shall submit the Design of the Illumination with Minimum 40 Lux with uniformity factor of 0.4

Technical Specification

Technical Specification No. 01 for Item Nos. 1 & 3

Supply of 10 Meter Octagonal Pole with 1.5- Meter dual/single arm (15°/5° inclination) with complete its accessories.

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

- 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.

- 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.

- 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.

The material of the pole as follows:

(a) Pole - Conforming to grade S355J0, with 4mm **sheet** thickness.
Pole Dimensions: -
Top (A/F)-Min 70mm, Bottom(A/F)- Min 175mm ,
Base Plate-275x275x16mm

(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.

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

- The poles shall have integrated Junction box with openable door with secured arrangement for opening of the door and shall be of adequate size (Not less than 500 mm. 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.

- The suitable cutout for door opening may be 500 mm. with reinforced & whether proof and 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.

- 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.

- 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.

- This also includes preparation of Pole earthing with GI earth pipe 40 mm. 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 10 mm. holes in diagonally opposite directions throughout the length of the pipe at 150 mm. 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.

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

- Top Mountings –The octagonal 10 Mtr. pole should be supplied along with galvanized 1.5 Mtr. double arm bracket made from GI Pipe of suitable size of dia, 1.5 Mtr. 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.

- The Poles shall be bolted on a pre-cast RCC or at site along with set of foundation bolts for greater rigidity.

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

Technical Specification No. 02 for Item Nos. 2 & 4

Erection of 10 Meter Octagonal Pole with 1.5- Meter dual/single 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 10-meter-long with detachable type double arm Octagonal pole on foundation to be prepared by excavation of pit of 600 mm. (W) x 600 mm.(L) x 1800 mm. 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 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.

Technical Specification No. 03 for Item No. 05

Supply at site energy efficient 250W (±5%) LED Street Light (Natural White) Street Light. 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.	Parameter	Requirement / Details
1	Type	250W (±5%) Street light LED (Natural White) Luminaire complete with IoT based control node for remote monitoring, switching, dimming, energy monitoring and fault detection for individual control and monitoring of Input Parameters of the street lights, with all accessories, wiring, installation and commissioning.

2	Luminaire Housing	Housing to be made of Pressure Die-Cast Aluminum ADC12 alloy. Large surface area with fins to dissipate the heat to ambient air. Luminaire must have separate led driver and optical compartments to ensure easy serviceability and thermal management. Construction standards according to: IS 10322-1, IS 10322-5-3.
3	Finish	Surface Finish: UV resistant aliphatic polyurethane/epoxy polyester hybrid Powder Coating. Corrosion Resistance: Suitable for C5 highly corrosive environment with high humidity and aggressive environments.
4	Heat Sink	Well-designed thermal management system with defined heat sink for heat dissipation
5	MCPCB (Metal Core Printed Circuit Board)	Highly heat-dissipating aluminium MCPCB base with copper thickness ≥75-micron & 2 W/mK thermal conductivity using proper thermal interface material.
6	Front Cover	4 mm thick extra-clear Toughned Safety glass
7	Optics	Optical System shall be provided with dedicated lenses array for LEDs. Lenses to be made of UV stabilized, Injection moulded non yellowing PC/PMMA cluster lens ensuring low glare & best in class uniformity.
8	LED chip make	As per Approved Make list ----- Nichia, Osram, CREE, Bridgelux
9	LED wattage	1.5-6 Watt
10	SDCM	SDCM ≤ 5
11	Coreralet Color Temperature: CCT	CCT: ≥ 4000°K ± 275 (Tolerance as per ANSI C78:377A).
12	Color Rendering Index: CRI	CRI: ≥70
13	LED lumen maintenance	L90B10 ≥100,000 Hrs @ 35°C
14	LED chip Efficacy	>180 Lm/Watt system lumen output at 25 degree C, supported by LM80 report, to be submitted.
15	Rated Voltage	240V AC
16	Input Voltage range	Single Phase 140V – 270V AC, 50 Hz
17	Frequency	50 Hz ±3%
18	Power Factor	≥0.95
19	Total Harmonics Distortion (THD)	<10% at full Load
20	System Wattage	250W (±5%)

21	Total Lumen Output	≥36000 lumens
22	System efficacy	≥ 150 lm/W
23	Ingression Protection- IP Rating	IP-66
24	Impact Resistance- IK rating	IK-08
25	Operating Temperature Range	-10°C to + 50°C
26	Electrical Insulation Class	Class-I
27	Surge Protection	Inbuilt surge protection of 6KV (Common & Differential Mode) and additional SPD of 20KV/10KA surge protection to be provided within the driver compartment.
28	**Driver Make**	Inventronics / MOSO / Osram/Meanwell
29	Driver Type	Constant Current based Electronic Driver, shall support Analog dimming Support - 0 to 10V for energy saving, support auxiliary power for IoT controller 5 to 12V DC @mA.
30	LED Drive current	>=350 mA<700 mA
31	Driver Efficiency	> 90%
32	Driver Life	> 50,000 hours and MTBF of LED driver should be > 2,00,000 hrs at nominal operating temperatures
33	Junction Temperature (Tj)	Should be less than value at which LM80 (IS16105) data published
34	Operating Humidity	10% to 95% RH
35	Clip / Fasteners	Corrosion free/ Stainless steel.
36	Wire	The connecting wires used inside the luminaries, shall be Low Smoke Halogen Free, fire retardant e beam cable.
37	Testing Compliance	LM-79/1S: 16105 Test Report from Third Party NABL Approved Lab LM-80/1S: 16106 Test Report from LED Manufacturer TM21 life projection calculations
38	Safety & EMI & EMC Compliance for Driver	BIS: IS 15885(Part2/Sec13)EN/IEC 61347-1, EN/IEC 61347-2-13 EN 61000, EN55015, EN 61547
39	BIS Luminaire	As per IS 10322 (Part 5/ Section 3)

40	Protection Required in Driver Module	Over Temperature, Under Voltage / Short Circuit, Over Voltage / Open Circuit & Output failure protections
41	Control	Luminaire Pre fitted with NB-IoT / 4G/ 5G technology-based controller for individual control and monitoring of Input Parameters of the street lights. ON, OFF, dimming, fault detection, schedule-based operation and manual operation for controlling of luminares
42	Communication	The Individual Light Monitoring (ILM) shall have onboard nano SIM slot for communication with NB-IoT / 4G / 5G network and exchange data over Secure communication with Secure Socket Layer (SSL). ILMC shall have high end chipset / microprocessor or equivalent with memory onboard for data processing, no communication antenna shall be outside ILMC unit.
43	LED ROHS Compliance (self-certification)	Manufacturer shall submit the Photo Biological safety Report for the LEDs as per IEC62471
44	Warranty / Guarantee	5 Years

Technical Specification of No. 04 for Item No. 6

This includes fixing & commissioning of supplied 250W ($\pm$5%) LED (Natural White) Street Light Luminary. The supplied fitting shall be fixed on 1.5 mtr double arm GI bracket and 1-meter single arm GI 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 armoured Aluminium cable. It shall also inhouse 1 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.

Technical Specification of No. 05 for Item No. 7

Supply, Installation, Testing & Commissioning of IoT based Smart Feeder Pillar

Supply, Installation, Testing & Commissioning of NB-IoT / 4G LTE based Smart CCMS Meter Based Lighting Control Panel suitable for centralized control and monitoring of street lighting feeder, complete with smart energy meter, inbuilt communication controller with SIM connectivity, cloud-based lighting management software and web/mobile monitoring system for remote operation of feeder panel.

The panel enclosure shall be fabricated from CRCA sheet steel (minimum 16 SWG body, 14 SWG mounting plate and gland plate) with IP65 ingress protection and IK10 impact resistance, powder coated RAL

7032 with 7-tank process, complete with locking arrangement, proper earthing terminal, engraved aluminium name plate and internal wiring with ferrules, terminals and connectors as per industrial standards.

The 3-phase smart lighting control panel shall have load capacity up to 20 KW (25 kVA) (or as required) and include reputed make electrical components such as MCBs, contactors, busbars, terminals (Connectwell/Elmex) and accessories from ABB / Schneider / Eaton / L&T or equivalent.

The system shall monitor phase voltage, phase current, power factor, frequency, total kW, kVA and cumulative kWh, and detect faults such as MCB trip, contactor fault, mains failure, door open status, over-voltage, under-voltage, over-current and over voltage alerts.

The CCMS shall support remote ON/OFF control, schedule-based operation (Astro timer / configurable schedule), real-time monitoring, energy reporting, event alerts and data logging through cloud-based street light management software, with two-way communication, firmware OTA upgrade capability and minimum 30 days data storage, accessible through web and mobile application dashboards.

The system shall comply with IS-16444 and IS-15959 communication protocol standards, communicate securely over 4G / 5G / NB-IoT cellular network, and provide features such as dashboard monitoring, asset management, daily operational reports, energy consumption reports, SMS/email alerts and GIS map view of feeder panels.

Technical Specification of No. 06 for Item No. 8

Providing IoT, Dashboard, Software, Network & Cloud services for ILM & CCMS for 5 years with following specifications:

Network Services specifications: The advanced and latest technology for communication is must and preferred likes of NB-IoT/ 4G/ 5G. The network readiness at site location shall be 100% and it shall be public network only. The network up-time must be 99% as per DoT guidelines and shall have license to deploy and maintain the network from Department of telecom, Govt. of India. The network service provider (NSP) shall have experience of providing network service under Make in India Initiative in any Public/Private sector and have capability to scale and maintain the network during project term.

Cloud Services specifications: The CCMS based lighting management software shall be monitored and controlled from any internet connected device(s) like laptop, desktop, mobile apps with 2 steps / factor login authentication for security of data access. This CCMS Lighting Management software / app shall be developed under Make in India by Indian registered agency only and must have experience of building scalable software's or mobile apps in the past for India based users / subscribers in any sector. The software must be hosted on MeitY (Ministry of electronics and IT dept, Govt. of India) approved cloud server and managed by clous service provider (CSP) agency empaneled on GoI, MEGHARAJ portal as CSP. The encrypted data should not cross or storage (shall not be done or accesses physically or virtually) it

should be within boundaries of India. The CSP shall have data centers (DC) and data recovery center (DR) in India and must have previous experience of handling data communication. The cloud server infrastructure shall be certified to International Organization for Standardization (ISO) 27001. It must be scalable platform for easy future upgrade developments and efficient maintenance. The server availability (SA) must be 99.5% or higher. The server shall be designed in such a way that, the CPU utilization < 60% and disk utilization <75%. The cloud server shall use cloud services or stack of Azure /AWS.

CCMS Software specifications: The CCMS Lighting Management Software shall support both CCMS feeder and individual light monitoring and control the same platform with single login to the system, no separate software or login required for end user. The inventory management feature is must. The Lighting Management Software (LMS) should be deigned, hosted, and managed by Indian origin organization under Make-In-India policy, GoI. This LMS software shall support and scalable, support virtual Group creation and operation, manual operation (ON/OFF), Individual dimming or virtual group-based dimming, schedule On/Off and dimming, Metering data collection, Scheduling based on astronomical clock (default), Seamless dimming 10-100%, display real time Alert status, data polling time minimum every 1 hours (default) and configurable up to 1 minute. Software shall support, graphical representation for project KPI’s.

The software shall have provision for selection of astronomical Mode, Calendar (Schedule mode), Manual Mode. The dashboard must have Street Light & CCMS Panel Status, energy saving status of whole system, Summary of all devices connected – Online, Offline, faulty, maintenance mode and no power details. Also, alert, project inventory details shall be displayed on dashboard. The operation response time in maintenance mode shall be < 10 sec, data update time on LMS < 10 min, Alert reflection time < 10 sec, Can map all switching point on the map / Google map interface or web based digital map. All control point's data/status visualization on a map for monitoring On/Off/Dimming commands from Map/List View, Wattage on each control points, Voltages on each control points, Current on each control points, PF on each control points, Metering kWh cumulative for total system, Metering kVAh cumulative for total system, Incoming supply status on each control points, High / Low voltage on each control points, Overload on each control points, Overcurrent of all control points, Over / Under voltage of all control points, Power outage of all control points, Manual ON or OFF of all control points, Power Theft of all control points, Relay failure of all control points, Lamp Failure of all control points, Lamp Life of all control points, Node loss of all control points, Alert Status, All alert records / history, Alert level & ID, Ability to clear / acknowledge or auto resolved the alarms, Display alarm list with date and time stamping, Display details for each alarm type, status, area Easily navigate between maps and alarms, Alarm details along with corrective suggestions, "Provision to configure max 3 Mobile Number‘s for getting alerts on email, SMS or from dedicated WhatsApp number to group", Alert Configurations (severity), Escalation Matrix Management & Reporting, Setting new ON / OFF timings, Setting the Real Time Count

(RTC) time of Automation unit, Reset the unit.

The remote FOTA upgrade facility support is must. The software application support "Create hierarchy ex) City > Region / Ward > Lane / Road > Street Light", Grouping control points, Alert level with ID and probable condition must be mentioned under alert ID. The LMS server should support Real time data storage for last 24 Months, archive data on cloud for 5 years. All historical data shall be stored for 5 years. The LMS shall support reports for Energy saving report, Lamp failure report, Actual hours of operation, Lamp up-time (%), Export as CSV format, Manual & Auto Generated Reports, Events & Log Management, Daily, Monthly, Yearly Trends, Hierarchy Definition & Creation, Group Creations, User authorization Management, log-in credentials, Group & Role Management, Add/remove control points by admin user, Semi-manual commissioning through application, all control points continue working in local mode as per Astro time in case of no communication or network failure.

The hardware commissioning must be done through mobile app and upload details to LMS during installation and commissioning. The QR code reader app must be provided for onsite commissioning, and QR code sticker shall present on CCMS panel, individual controller and lights comprising of OEM details, model, year and month of manufacturing, unique serial number, wattage details, panel details etc.

Technical Specification of No. 07 for Item No. 9

(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, 50 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, 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.

(d) This includes supply at site 1.1 KV grade, 4 Core, 95 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.

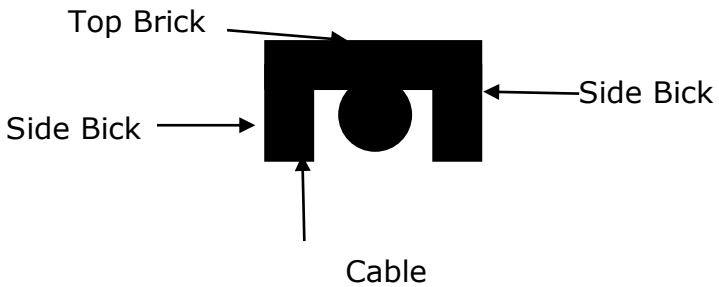
Technical Specification of No. 08 for Item No. 10

This includes laying & end termination of 1.1 KV XLPE armoured L.T cable in proposed hard & soft Soil /Laying on half round "6" RCC pipe / Laying through horizontal boring / laying through double walled corrugated HDPE pipe of suitable size.

Method of Laying.

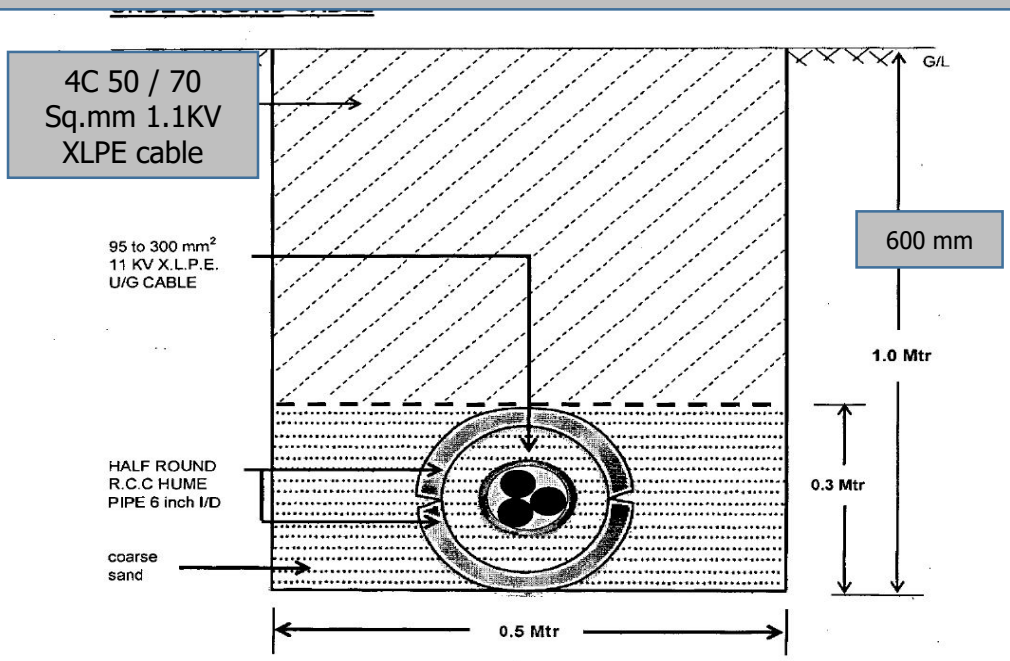
(a) This includes laying of single length cable of size up to 4 core, 95 Sq.mm LT armoured aluminum Conductor XLPE Cable of 1.1KV Grade through excavation in soft/hard soil. The trench to be excavated 300mm wide, 600mm deep. The bed of 50mm of river sand shall be provided in the bottom of the excavated trench. The cable shall be laid over the bed of river sand. The cable shall be protected as per Sketch shown below 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 shown in the sketch. 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 spread over the 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 heavy duty HDPE plate width red radium colour. The work includes complete labour and materials and to entire satisfaction of Engineer-in-charge.

Sketch



(b) The item includes laying of single length cable of size 4 core x 50 Sq.mm & 4 core x 70 Sq.mm LT armoured aluminum Conductor XLPE Cable of 1.1KV Grade both in the ½ round RCC hume Pipe 6" I/D the half round pipe should be laid on the coarse sand. The cable shall be laid on the existing half round pipe as shown in the drawing after laying of cable the pipe should be filled with fine sand and covered with half round pipe. At every approximately 15mtr length of there should be inspection chamber

Tentative Diagram of laying of 1.1KV XLPE cable through Half Round pipe



(c) This includes laying of single length cable of size up to 4 core, 95 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 75 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.

(d) This includes laying of single length cable of size up to 4 core, 95 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 at road turning over the bed of river sand in HDPE Pipe of size 75 mm or more. 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 spread over the 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 heavy duty HDPE plate width red radium colour. The work includes complete labour and materials and to entire satisfaction of Engineer-in-charge.

(e) This includes laying/ Fixing of single length cable of size 4 core, 16 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.

Technical Specification of No. 09 for Item No. 11

The contractor has to arrange reclamation materials as per Govt. Norms, such as coarse graded material spreading and competing 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 of No. 10 for Item No. 12

Supply of 11 KV HT 3C X 95 Sq. mm. insulated armored XLPE Aluminum conductor.

The work includes Supply at site 3CX95 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. ^0C	:	90
	(b) Maximum allowable temp. under short circuit condition ^0C		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 of No. 11 for Item No. 13

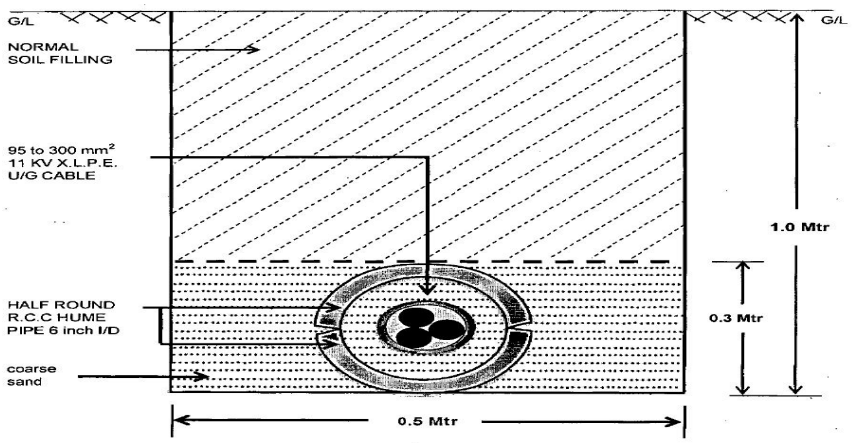
Laying in Hard/Soft Soil for 11 KV HT 3C X 95 Sq. mm. XLPE Aluminum conductor.

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 3Cx95sqmm 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.

This includes laying of 3 core x 95 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 so as 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 0.3 Mtr.

DRAWING FOR LAYING OF ONE NO 11 KV 95 TO 300 mm2 X.L.P.E. UNDE GROUND CABLE



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 DPA. 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 DPA 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 of No. 12 for Item No. 14

Laying for Railway/Road Crossing/RCC through HDD Single length 11 KV HT 3C X 95 Sq. mm. XLPE Aluminum conductor.

This includes Laying 3 core x 95 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 have 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 of No. 13 for Item No. 15

Supply, fixing and testing of Outdoor Cable Termination kit for 11 KV 3C X 95 Sq. mm. XLPE Cable.

This includes providing & making Indoor/outdoor end Termination kit on HT (11 KV) 3CX95 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 of No. 14 for Item No. 16

The item includes Supply and fixing Double Pole Structure with 11KV A.B. Switch & DO Fuse on 11 meter RCC/PSC pole. The DP structure should be erected near the tapping point from where the LT cable from the meter box will be directly terminated on the M.S Distribution board incomer & outgoing cable should be laid from the Distribution board through timer circuit to the lighting pole. The 100KVA, 11/415V Transformer is to be fitted at least 4 to 5 meter form the ground level and the Distribution Panel is to be fitted at least 3meter from 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 & Distribution Transformer as per latest IS/IEC Standards & PGVCL Norms, however location may get changed as per site situation. Double pole structure should be solidly earthed from two points with individual earthing and a 'Danger' sign board should be provided on the Double Pole structure as instructed by Engineer in Charge. The Double pole structures have to be firmly installed on the site and two layers of anticorrosive coatingand three layers of high quality paint with best workmanship is to be done. This also includes painting numbering the poles in 100mm round dia.
The below table shows tentative items (but not limited) to be used for this work.The same may be used for reference. However, the bidder is suggested to visit thesite for ascertaining actual requirement of items.

SR	PARTICULARS	UNIT	QTY
1	11 meter RCC/PSC pole (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	11 KV A.B. SWITCH 400 AMP.	SET	1
6	Side Clamps for mounting A.B Switch (M.S Flat of size50X6)	NO.	16
7	Ancher rod - 1 No.	NO.	4.00
8	Turn buckle - 1 No.	NO.	4.00
9	Eye Bolt - 1No.(16mmX590 mm Round Bar).	NO.	4.00
10	Stay wire- 7/12	KG	13.60
11	HT Guy Insulator - 1 No.	NO.	4.00
12	Guy Clamp - 1 Set.	SET	4.00
13	GI Wire No. 8 From Pole Top to Earthing Coil	KG	2.72
14	Rigid PVC Pipe -20mm dia. (1.5 Mtr.) - 1No	NO.	2.00
15	Earthing Bolt	NO	2.00
16	Earthing Coil (GI Wire No 8)	NO	2.00
17	Aluminium Binding wire	KG	0.50

18	11 KV Porcelyn Disc Insulator	NO.	12
19	11KV Disc. Hardware	SET	6
20	11 KV COMPOSITE POLYMERIC D O FUSE	NO.	3
21	M.S. Bolts & Nuts 65x16mm	KG	7.2
22	M.S. Bolts & Nuts 180x16mm	KG	2.49
23	Barbed wire as per requirement		

Note: Above table is just for reference and summarizes minimum requirement of materials for one DP structure with D.O. Fuse on 11MTR RCC/PSC POLE. Any item with MS has to be Hot Dip Galvanized.
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 Meter 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 of No. 15 for Item No. 17

This includes design, supply at site, installation, testing and commissioning of Outdoor mounted type Feeder pillar panel double shutter, Top Canopy, 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 powdered coated using Siemens grade paint. The feeder pillar shall be specious for easy maintenance and shall be specious to be provided with all the material mentioned below.

Sr. No.	Description	Qty.
1	200 / 250Amps, 415 V 50 Hz Volt ICTPN Switch.	1 No.
2	100 A, 415 volt 4 pole MCCB C curve for outgoing cable	6 No.
3	20A, 10KA 2 Pole MCB for panel power supply	1 No.
4	Indicating lamp Red, yellow & blue 230/240v AC, with in built resistance	1 No.
5	Surface mounted light sensor timer Switch	1 No.
6	3 phase 4 pole heavy duty Contractor suitable for 150A (Load Current)	1 No.
7	Analog Time Switch	1 No.
8	Multifunction Meter	1 No.

9	Suitable size of Aluminium bus bar for Phase & Neutral, PVC sleeved with colour code. Danger Board, tie belt etc.	Lump sum

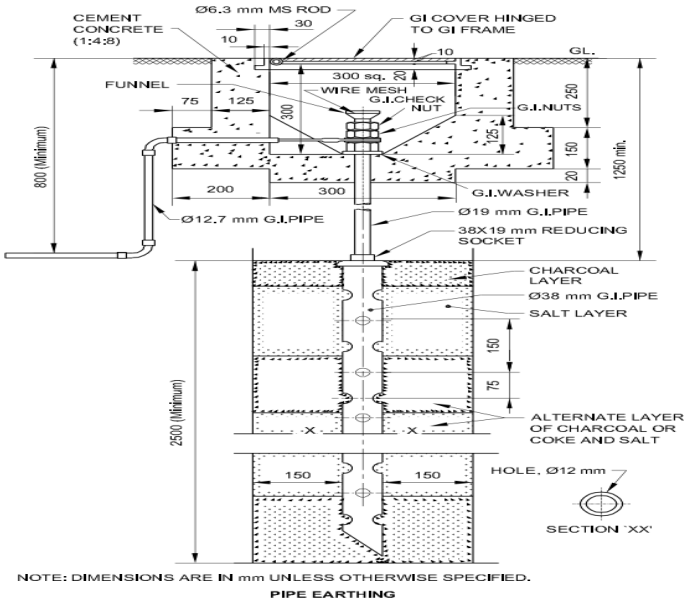
All these components shall be mounted in the feeder pillar by means of suitable cadmium passivated hardware. The feeder pillar shall be complete in all respects with cable glands, lugs for incoming and outgoing cables including interconnection with PVC insulated cable single core, standard copper conductor of 650/1100V grade.
The feeder pillar shall be erected on DP structure at suitable height by using proper M.S channel frame of Proper size. The M.S channel frame 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 IS. The feeder pillar shall be provided with 2 Nos. SS 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 Feeder Pillar drawing should have to be approved by inspection agencies / Engineer-in-charge before placing the order showing the position of the components as mentioned in Sr. No. 1 to 9. This includes all labour and material as directed by Engineer-in-charge.

Technical Specification of No. 16 for Item No. 18

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 & individual transformer 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 of No. 17 for Item No. 19

This includes providing of protection guard fencing to DP Structure 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 than 1.5 Mtr. 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 0.45 Mtr. 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 DP Structure shall not be less than 4.5 Mtr. x 4.5 Mtr. This work includes all material, labour, tools & tackles as directed by Engineer In-Charge.

Technical Specification of No. 18 for Item No. 20

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

Sr. No.	Item	11 kV Distribution Transformers
1	Rated KVA (ONAN rating)	100 KVA
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	Percentage impedance at normal tap at 75^0C	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	12 KV rating oil filled porcelain type
ii)	Creepage distance	25 mm./ KV
iii)	LV bushings	1.0 KV 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)	75 KVP
ii)	Power frequency voltage withstand	
a)	HV winding	28 KVrms
b)	LV winding	03 KVrms
23	Bushing stem for 100 KVA with Nuts	
ii)	HV side	standard
iii)	LV side	standard

Supply, Installation, Testing and Commissioning of Outdoor Type Pole mounted Transformer of 11 KV/415 Volts, equipped with 100 KVA 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.

Technical Specification of No. 19 for Item No. 21

Comprehensive Maintenance Contract for the entire system for 5 years with manpower, material on 24x7 basis including watch keeping etc. and attending & solving of complaints/faults of entire Electrical and IoT System etc. within stipulated period.

Sd/-
Executive Engineer (E)
Deendayal Port Authority