SAGARMALA
PORT-LED PROSPERITY

DEENDAYAL PORT AUTHORITY

ISO 9001:2008 ISO 14001:2004

PM GatiShakti

Office of Executive Engineer (M&E)
Administrative Office building,
Off Shore Oil Terminal,
Vadinar - 361010.

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EXPRESSION OF INTEREST

Sub: Conversion of Overhead Power Distribution System to Underground Cabling Power Distribution System in Port Colony OOT, Vadinar

(This Notice is issued only 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. Public Tenders will be issued subsequently)

SECTION – I

Deendayal Port Authority (DPA) invites expression of interest from the Registered Contractors and having experience of Works: Conversion of Overhead Power Distribution System to Underground Cabling Power Distribution System.

Scope of the Work:

Conversion of Overhead Power Distribution System to Underground Cabling Power Distribution System in Port Colony OOT, Vadinar (Cable shall be provided by DPA)

The party shall submit quotation in the format provided at **as Attached**.

Interested Parties are requested to submit EOI in hard copy not later than **17:00 hours** IST on **10/04/2025**.

The Firms may also submit their suggestions and views, if any, that can be considered for the Project, in a separate sheet.

Address for communication:

M & E Division,
Administration Office Building,
Offshore Oil Terminal,
Deendayal Port Authority,
Vadinar, Dev Bhoomi Dwarka - 361010.
Tel: 0288-2573033
Email: megr1.oot@deendayalport.gov.in / garagesectionoot@gmail.com

LETTER OF TRANSMITTAL
(To be typed in Firm's Letterhead)

To
The Executive Engineer (E&M)
Administration office Building,
Offshore Oil Terminal,
Deendayal Port Authority,
Vadinar, Dev Bhoomi Dwarka – 361010.

Sub: Conversion of Overhead Power Distribution System to Underground Cabling Power Distribution System in Port Colony OOT, Vadinar.

Sir,

Having examined the details given in EOI Notice and EOI document for the above project, I/we hereby submit our Expression of Interest and the relevant information.

1. I/We hereby certify that all the statements made and information supplied in the enclosed form and accompanying statements are true and correct.
2. I/We have furnished all information and details necessary for EOI and have no further pertinent information to supply.
3. I/We also authorize Deendayal Port Authority or their authorized representatives to approach individuals, employers and firms to verify our competence and general reputation.
4. I/We submit the following certificates in support of our suitability and capability for having successfully provided the services along with prescribed format.
5. We understand that DPA will be at liberty to finalize requirements and issue public tenders for the work.

Seal & Signature(s) of Applicant(s)

Enclosures:
Date of submission:

Name of Work: Conversion of Overhead Power Distribution System to Underground Cabling Power Distribution System in Port Colony OOT, Vadinar.

Sr. No		Description of Items	Unit	Qty.	Rate	Amount
1		**Excavation and backfilling of the trench**				
	i	**Excavation and backfilling work** by mechanical means (Hydraulic excavator) / manual of Hard and soft soil for installation work of laying of Cables. Quantity as per actual. Size for excavation and backfilling of the trench is as mention bellow. **To be executed as per Technical Specification no. 01.**				
		(a) Width:1.2 Meter, Depth:0.91 Meter	Meter	440		
		(b) Width:0.6 Meter, Depth:0.91 Meter	Meter	3486		
	ii	**Excavation and backfilling work** by mechanical means (Hydraulic excavator)/manual through PCC Road crossing / PCC flooring and Brick wall crossing for installation work of laying of Cables. Quantity as per actual. Size for excavation and backfilling of trench is as mention bellow. **To be executed as per Technical Specification no. 01.**				
		(a) Width:1.2 Meter, Depth:0.91 Meter	Meter	65		
		(b) Width:0.6 Meter, Depth:0.91 Meter	Meter	185		
	iii	**Excavation and backfilling work** by mechanical means (Hydraulic excavator) / manual of Hard and soft soil for installation work of laying of Cables through DWC HDPE pipes having minimum 35 mm Inner Diameter. Quantity as per actual. Size for excavation and backfilling of the trench is as mention bellow. **To be executed as per Technical Specification no. 02.**				
		(a) Width:0.15 Meter, Depth:0.15 Meter	Meter	2050		
	iv	**Excavation and backfilling work** by mechanical means (Hydraulic excavator) / manual of PCC Road cutting by road cutter suitable for minimum 35 mm Inner Diameter DWC HDPE pipes for laying of Cables. Quantity as per actual. **To be executed as per Technical Specification no. 02.**	Meter	1762		
2		Supply of DWC HDPE (Double wall corrugated high density polyethylene) pipes of standard length of minimum 35 mm Inner Diameter for 4/3.5 Core 16/35 sqmm XLPE aluminium cable Confirming to IS 14930 part II (amended up to date), including all local & central taxes, transportation and freight charges inspection charges, loading / unloading charges,	Meter	8500		

	conveyance to the site of work. Stacking the same in closed shade duly protecting from sunrays, rain & theft or physical damage, etc. Quantity as per actual. **To be executed as per Technical Specification no. 02.**					
3	**Laying of Cables (Cables shall be provided by DPA)**					
	i	Cable Laying and Installation of Aluminum conductor, armoured, XLPE insulated, PVC sheathed, 1.1KV cable in Excavated trench and refilling of trench with sand & Cable Tiles as per site requirement with necessary Cable Pulling wiches, Jecks, Rollers and other hardware for laying of cables. **Quantity as per actual.** Laying to be done as per **Technical Specification no. 01. Cables of size as mentioned below:**				
		(a) 3.5Cx240 Sq.mm cable	Meter	1500		
		(b) 3.5Cx120 Sq.mm cable	Meter	3000		
		(c) 3.5Cx 70 Sq.mm cable	Meter	500		
		(d) 4 Cx 16 Sq.mm cable	Meter	1000		
	ii	XLPE Aluminum Armoured Cable of below mentioned sized to be laid inside DWC HDPE pipes in Excavated trench with necessary Cable Pulling wiches, Jecks, Rollers and other hardware for laying of cables and refilling of trench to be restored in its original position as per site requirement. **Quantity as per actual. Laying to be done as per Technical Specification no. 02. Cables of size as mentioned below:**				
		(a) 3.5Cx 35 Sq.mm cable	Meter	3500		
		(b) 4 Cx 16 Sq.mm cable	Meter	5000		
4	Supply, Installation, testing and commissioning of **Main Distribution Panel** consisting of arrangement of 01 no. of 1000 Amp Incomer and 09 nos. of 250 Amp. and 01 no. of 63 Amp Outgoing feeders with indication lamps and Multifunction meters, MCCBs with all necessary protection relays, metering and control systems. **As per Technical Specification no. 03** (a) Rating of Incomer 1000 Amps 433V 50KA 4P Electrical Draw Out (EDO) Air Circuit breaker(ACB) with microprocessor based release for over current, short circuit and earth fault protection. - PR 121 Qty. 01 Nos. (Make: ABB, L&T, SIEMENS, C&S) (b) 4 pole 1000A Bus Coupler Qty. 01 Nos. (c) Rating of Outgoing MCCB TPN 250 A, 35KA (microprocessor based release O/L with Ics = 100% Icu). Qty. 09 Nos. (Make: ABB, L&T, SIEMENS, C&S) (d) 4 pole 63 Amp. MCB type C Qty. 01 Nos (Make: ABB, L&T, SIEMENS, C&S) (e) MCCB 125 Amps, 415V, 50Hz, 36kA (microprocessor based release O/L with Ics= 100% Icu) with Digital Timer with 50A 3 pole	Nos.	1		

	power Contactor set for Street Light Feeder Qty. 01 Nos.				
5	Supply, installation, testing and commissioning of **Auxiliary Distribution Panel.** Auxiliary Distribution Panel consisting of arrangement of Outgoing feeder with indication lamps and Multifunction meter of MCCBs with all necessary protection relays, metering and control systems. **As per Technical Specification no.04**(a) Rating of Incomer 800 Amps 433V 50KA 4P Electrical Draw Out (EDO) Air Circuit breaker(ACB) with microprocessor based release for over current, short circuit and earth fault protection. - PR 121 (Make: ABB, L&T, SIEMENS, C&S Qty. 01 Nos.(b) 4 pole 800A Change Over Switch Qty. 01 Nos.(c) Rating of Outgoing MCCB TPN 250 A, 35KA (microprocessor based release O/L with Ics=100% Icu). Qty. 09 Nos.(d) 4 pole 63 Amp. MCB type C Qty. 01 Nos(e) MCCB 125 Amps, 415V, 50Hz, 36kA (microprocessor based release O/L with Ics= 100% Icu) Digital Timer with 50A 3pole power Contactor set for Street Light Feeder Qty. 01 Nos.	Nos.	1		
6	Supply, installation, testing and commissioning of **Outdoor type feeder pillar panels** suitable for AC 440 V, 50 HZ supply, Outdoor panel consisting of arrangement of Outgoing feeder with indication lamps and Multifunction meter. **as per Technical Specification no.05** (a) Rating of incomer MCCB TPN 250 A, 35KA (Microprocessor based O/L, Earth fault with Ics = 100% Icu), Qty. 01 Nos. each Feeder Pillar. (b) Outgoing MCCB, 25KA, of 4 Pole 125A rating of 06 nos. each Feeder Pillar. (c) Outgoing MCB, 25KA, of 4 Pole 63A rating of 01 nos. Each Feeder Pillar	Nos.	14		
7	Providing & fixing of heat shrink straight through Joint Kit suitable for L.T. 1.1 KV PVC/XLPE armoured cable of following sizes. Quantity as per actual. **To be executed as per Technical Specification No.06**				
	(a) 3.5Cx240 Sq.mm cable	Each	5		
	(b) 3.5Cx120 Sq.mm cable	Each	10		
	(c) 3.5Cx 70 Sq.mm cable	Each	3		
	(d) 3.5Cx 35 Sq.mm cable	Each	20		
	(e) 4 C x 16 Sq.mm cable	Each	20		
8	Providing and Fixing Chemical earthing as given below. Chemical Earthing using Electrode of size 80 mm dia,3-meter-long connected with 25X3 mm Copper internal strip complete with excavation, civil works, earthing chamber, cast iron cover with back fill compounds as per Outgoing MCB, 25KA, of 4 Pole 63A rating of 01 nos. Each Feeder Pillar. Quantity as per actual. As per **Technical Specification no.07**	Each	32		

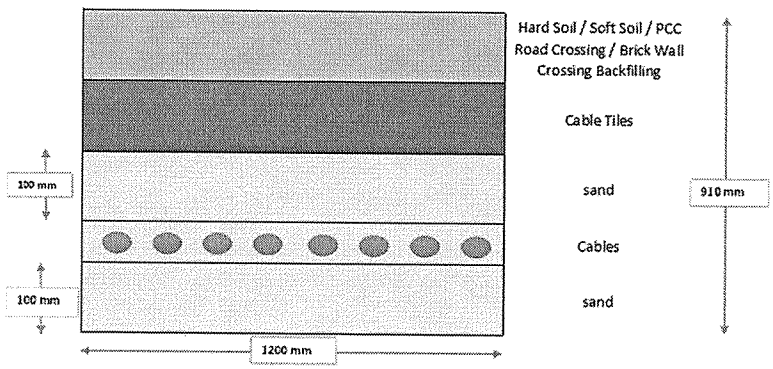
9	Supply, Laying & connecting of GI Strips Connecting earth station to the equipment 25x3mm thick. Quantity as per actual. As per **Technical Specification no.08**	Meter	400		
10	Construction of foundation etc. with M20 grade PCC complete with cantering, shuttering and reinforcement as per design, The Foundation of panel as per size of panel, as per **Technical Specification no. 09.**	Nos.	16		
11	Supplying and fixing cable route marker with 100 mm of Disc size with G.I. plate with inscription there on, bolted / welded to 35 mm X 35 mm X 6 mm angle iron, 30 cm long and fixing the same in ground as required at every 50 Mtr or as per direction of site engineer duly engraving with letters "LT Cable" as applicable with an arrow (→) letter showing distance and depth at which cable is buried on a smooth and clean finished surface confirming to IS 5820-2001 with painting of 2 coats of apex over coat of primer with yellow shade and the letters with contrast red shade. LT cable rout markers approved by DPA may be installed as per site requirement.	Each	160		
12	Supply and Fixing of SMC Junction Boxes as per **Technical Specification No. 10**. Quantity as per actual.	Nos.	150		
13	Dismantling of existing LT Distribution panel, LT overhead power Distribution lines complete with all associated items like Conductors, insulators, overhead cables, wires, studs, MS structure, LT box, switching box etc. and depositing the same in DPA Main Store including materials handling and shifting. Quantity as per actual. (Dismantling to be carried out only after successful commissioning of Underground Cabling Power Distribution System as per Terms & conditions.)	Meter	3300		
Total Amount					

TECHNICAL SPECIFICATIONS

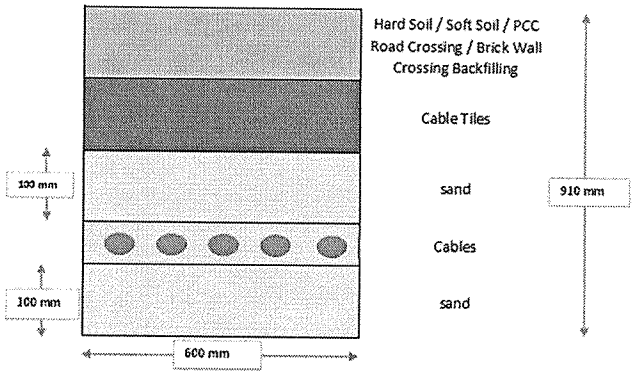
Technical Specification No. 01:

- The trench is to be excavated as per the BOQ item no. 1 (i) (a), 1 (i) (b), 1 (ii) (a) and 1 (ii) (b).
- This includes laying of single length cables up to 3.5/4.0 core x 240 sq.mm L.T. armored aluminum Conductor XLPE Cable of 1.1KV Grade through excavation in Hard Soil / Soft Soil / PCC Road Crossing / PCC Flooring / Brick Wall Crossing.
- The bed of 100mm of sand (clean sand type of soft, fine aggregate that is typically graded between 1 and 2 mm of uniform size) shall be provided at the bottom of the excavated trench. The cable shall be laid over the bed of sand (clean sand type of soft, fine aggregate that is typically graded between 1 and 2 mm of uniform size) with the help of with the help of winches, jacks, rollers, pulleys, etc. without damaging the cable. The cable shall be protected as per Sketch shown below by providing 100mm of sand bed (clean sand type of soft, fine aggregate that is typically graded between 1 and 2 mm of uniform size) above the cables & the gaps shall also be filled with sand (clean sand type of soft, fine aggregate that is typically graded between 1 and 2 mm of uniform size).
- The cable shall be covered by laying cable tiles on top of it as shown in the sketch.
- The back filling of the trench shall be done with the excavated stuff (Hard Soil / Soft Soil / PCC Road Crossing / PCC Flooring / Brick Wall Crossing) & should be watered and rammed properly and to be restored in its original position i.e. Hard Soil / Soft Soil / PCC Road Crossing / PCC Flooring / Brick Wall Crossing. The excess excavated stuff shall be disposed of from the Site of work and spreaded in low laying area as directed.
- The contractor shall provide heat shrinkable straight through joint of relevant size of approved make if the laying of cable shall be more than standard drum length i.e. 500m.
- After completion of the backfilling process there will be set up of LT Cable Route Marker which is 50m apart with each other.

Sketch



For BOQ item no. 1 (i) (a) 1.2 meter wide, 0.91 meter deep



For BOQ item no. 1 (i) (b) 0.6 meter wide, 0.91 meter deep

Technical Specification No. 02:

- The trench is to be excavated as per the BOQ item no. 1 (iii) (a) and 1 (iv).
- This includes supplying and laying of standard length of minimum 35 mm Inner Diameter DWC HDPE (Double wall corrugated high density polyethylene) pipes in Excavated Trench.
- Separate DWC HDPE pipes to be supplied and Individual Cables shall be passed through the supplied DWC HDPE pipes.
- The cable shall be pass through heavy duty DWC HDPE pipe and it is to be laid down inside the trench excavated as per the BOQ item no. 1 (iii) (a) and 1 (iv).
- Coupling of the HDPE pipes by HDPE socket to be carried out only after standard length and to be followed by sealing of HDPE pipe ends by suitable cap.
- The back filling of the trench shall be done with the excavated stuff (Hard Soil / Soft Soil / PCC Road Crossing / PCC Flooring / Brick Wall Crossing) & should be watered and rammed properly and to be restored in its original position i.e. Hard Soil / Soft Soil / PCC Road Crossing / PCC Flooring / Brick Wall Crossing. The excess excavated stuff shall be disposed of from the Site of work and spreaded in low laying area as directed.
- This Specification covers design, manufacturing, testing, packing, supply, installation of DWC HDPE Pipe as mentioned above.

Technical Parameters:

a) DWC high density Polyethylene pipe shall have corrugation on outer wall but inner wall shall be plain, conforming to IS – 14930 Part I and II amended from time to time.
b) Terminology as defined in IS: 14930 shall be followed.
c) DWC HDPE pipe to be supplied shall be 'ISI' marked.
d) Accessories like HDPE snap fit coupler with neoprene 'O' ring shall be part of supply to make the joints water / damp proof.

REQUIREMENT OF DWC HDPE PIPE

a) Visual Requirement: The Pipe shall be checked visually for ensuring good workmanship that the pipes shall be free from holes, breaks and other defects. The ends shall be cleanly cut and shall be square with axis of the pipes.
b) Colour: The purchaser shall supply only single colour DWC HDPE pipe.
c) Dimensions: The dimensions of the DWC HDPE pipe shall be as per requirement /BOQ.
d) Standards Length: Pipe up to 35 mm inner diameter size shall be supplied in standard length of 100 mtr. ± 1% or 6 mtr ± 1 %.
e) Compression Strength: The conduit system shall have adequate mechanical strength. Conduits when bent or compressed either during, or after, installation according to manufacturer's instructions, shall not crack and shall not be deformed to such an extent that introduction of the insulated conductors or cables becomes difficult or that the installed insulated conductors, or cables are likely to be damaged while being drawn in. Compliance may be checked with the application of force which shall be at least 450 N, when reaching the deflection of 5%.
f) Resistance to Flame Propagation: Non flame propagating pipes shall have adequate resistance to flame propagation.
g) Anti-Rodent Properties: Safety of pipes from the direct attack of subterranean organism anti rodent material is of utmost importance. These

h) Marking Identification: The conduit shall be prominently marked at regular intervals along their length of preferably 1m but not longer than 3m using indelible ink with following.
   a. Manufacturers name
   b. Specification No.
   c. Name of the duct with size
   d. Lot No. of the Product
   e. Date of manufacture
   f. Purchaser's Name/symbol

Technical Specification No. 03:

- This includes supply, installation testing and commissioning of Main Distribution Panel Indoor type, pedestal type fabricated from 2mm thick powder coated metal sheet, along with suitable type of angles.
- The entry of all the cable will be from bottom side.
- The panel shall be duly certified by CPRI/ERDA standards.
- This includes providing and fixing of Heat shrink indoor/outdoor end terminations of 3.5 /4 core LT 1.1 KV grade PVC-A-PVC/XLPE Cables, including providing fixing of Aluminum Solder Less Lugs & glands of suitable size with all required materials.
- The work includes all labour, tools tackles, indoor/outdoor heat shrink end terminations kit of approved make and necessary fabrication work on gland plate of the panel as directed by Engineer-in-Charge.

The switchgear to be fixed as follow:

i) **Incomer:** Air Circuit Breaker (ACB) electrical draws out type of 1000 Amps, 415V, 50HZ, 4pole 50kA with multi protection relay with Digital multifunction meter - 1 No.

ii) **Outgoing Feeders:** MCCB 250 Amps, 415V, 50Hz, 36kA (microprocessor based release O/L with Ics= 100% Icu) with extended terminal with Digital multifunction meters with bolted type Bimetallic Connector to connect 240 sqmm to 300 sqmm aluminum cable – 09 Nos.

iii) **Street Light Feeder:** MCCB 125 Amps, 415V, 50Hz, 36kA (microprocessor based release O/L with Ics= 100% Icu) with extended terminal with Digital multifunction meter with Digital Timer with 3 pole 50 Amp power Contactor set – 01 No.

iv) **Aux. Supply Feeder:** 4 pole 63 Amp. 10kA MCB - 01 No.

(Make: DPA Approved Make)

TECHNICAL SPECIFICATIONS OF MAIN DISRIBUTION PANEL			
Sr. no.	**Technical parameters**	**As Per Specification**	**To Be Filled By The Supplier**
CONSTRUCTIONAL FEATURES			
1	Manufacturer's name	To be specified by supplier	
	Rated operational		

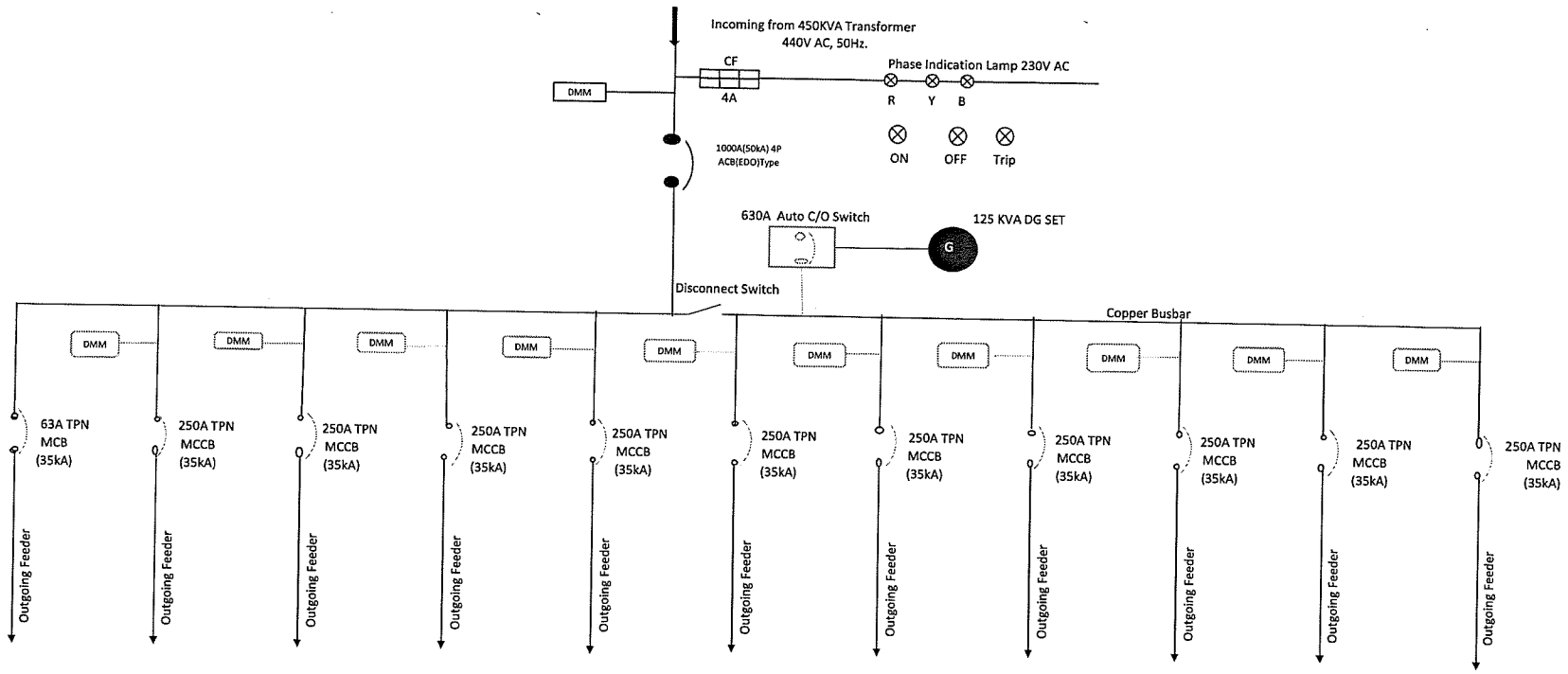
3	Rated insulation voltage	1.1 KV	
4	Rated short time withstand current	50kA	
5	Rated current	As specified in Tender	
6	Sheet steel thickness	1.6mm (min.) CRCA for doors, 2.0mm for load bearing members and gland plates	
7	Degree of protection for enclosure	IP 52	
8	Compartmentalized single front	Single front	
9	Design Ambient temperature	50° Celsius	
10	Incoming Entry	Bottom	
11	Outgoing cable entries	Bottom	
12	Dimensions (L x B x H)	Approximate dimensions shall be specified	
13	Approx. weight	Approximate weight shall be specified	
14	Paint shade	RAL 7035 / RAL 7032	
15	Min and Max Operating height	300 mm to 1800 mm from bottom of the base channel	
16	Required operating clearances front, sides & rear	To be specified by supplier	
17	Tier formation	Single tier for ACB feeders and multi-tier for others. Width of single vertical shall be 600 mm minimum for ACB feeders, 500mm minimum for MCCB feeders, maximum up to 5 feeders in vertical.	
18	Type of Mounting	Floor mounting with base channel of 75 mm for Power Control Centre (PCC)	
19	Type of termination all O/G cables	Above 100A Bus bar and others thru suitable rating stud type terminals shall be used	
20	Indication lamps	Indication (RYB & ON,OFF,TRIP) lamps at the Incoming and for outgoing (on) indication shall be provided.	
21	Door interlock	To be provided	
22	Minimum clearances in air		
	a) between phases	25.4 mm	
	b) between live parts and ground	19 mm	
23	All feeders shall be provided with ammeter, 3 CT as per tender.	To be provided by supplier	
BUSBARS			
	Material for main		

2	Cross – section of main bus bar	To be specified by the supplier- for current density 1Amp/sq.mm at rated current	
3	Max Continuous current rating at design ambient temperature of main bus bar inside the chamber	85^0 C	
4	Bus connections to circuit breakers	As per rated currents of circuit breakers	
5	Rated short circuit current	35 KA	
6	Rated insulation voltage for Insulator supports	To be specified by supplier	
7	Material of main bus bar supports	To be specified by supplier	
8	Materials of earth bus bar	GI 50 x 6 mm (min.)/ Aluminum 50 X6 mm for PCC	
		AIR CIRCUIT BREAKER	
1	Make	DPA approved make	
2	Type	To be specified by supplier	
3	Type of breaker	Fully draw-out, air break	
4	Ambient temperature	50 degree centigrade	
5	Rated insulation voltage	To be specified by supplier	
6	Breaker rating	As per Single line Diagram	
7	Rated short-circuit making capacity	105 KA (peak)	
8	Rated ultimate short circuit breaking capacity	50 kA.	
9	Rated service short-circuit breaking capacity	50 kA	
10	Rated short time withstand current	50 kA for 1 Sec.	
11	Type of release Microprocessor based, protection functions O/C/SC/EF with options for both for inverse & definite time	The ACB- shall be Microprocessor based E/F, IEF, O/C, & S/C releases and shall be 4 pole for all incomer in PCC. The ACB shall be electrically operated, motorized spring charging along with manual spring charging in cases of electrical failure. Model no & relevant catalogues shall be submitted	
12	Rated current of over current trip device	To be specified by the supplier	
13	Features of o/c trip	To be provided	

14	Function blocking selection	To be provided	
15	Fault visual indication	To be provided	
16	Self-test facility with breaker in isolated position	To be provided	
17	Visual indication for self-check	To be provided	
18	Site selectable inverse/definite time characteristic for E/F and S/C	To be provided	
19	Type for I/C feeders operation	Motorized	
20	Type for O/G feeders	MDO/ EDO as per SLD	
21	Trip free design	Trip free, stored energy	
22	Electrical and mechanical anti-pumping feature.	To be provided	
23	Auxiliary supply for Voltage & permissible range for spring charging motor, CLOSING & TRIPPING COIL	110 V, 1 Ph., 50 Hz., AC. Range : 70 – 110 % for trip coil, 80-100% for closing coil & spring charging	
24	Mechanical indicator for Spring charged / discharged, electrical indication for ON/OFF/TRIP	To be provided	
25	Shunt trip	To be provided in PCC	
26	Utilization category	B	
27	Quantity and rating	As per Tender	
MOULDED CASE CIRCUIT BREAKERS (MCCBs)			
1	Make	DPA approved make	
2	Type	Air break	
3	Rated insulation voltage	To be specified by supplier	
4	Rated ultimate breaking capacity	35KA / 25KA	
5	Rated short circuit braking capacity	105 kA	
6	Rated service short-circuit	35KA / 25KA	

7	Protective device type	The MCCB - shall be Microprocessor based O/C, & S/C releases for All incomers and outgoings in PCC/AC/ Heater panels. Model no & relevant catalogues shall be submitted	
8	Door interlock	To be provided	
9	Utilization category	B	
10	Visual indication for status (LED indication ON/OFF/TRIP)	To be provided	
CURRENT TRANSFORMERS			
1	Make	DPA approved make	
2	Type	Tape Wound	
3	CT secondary	5A	
4	Accuracy Class for Metering	1, ISF < 5	
5	One minute p.f. Withstand voltage	2.5 kV RMS	
6	Burden	10 / 5 VA	
7	Applicable standards	IS : 2705 (1992)	
Ammeters / Voltmeters/MFM meters			
1	Make	To be specified by supplier	
2	Type	Digital	
3	Accuracy class	Cl-1	
4	Size	96 x 96 mm	

Main Distribution Panel Located at Electrical Control Room



Technical Specification No. 04:

- This includes supply, installation testing and commissioning of Auxilary Distribution Panel Indoor type, pedestal type fabricated from 2mm thick powder coated metal sheet, along with suitable type of angles.
- The entry of all the cable will be from bottom side.
- The panel shall be duly certified by CPRI/ERDA standards.
- This includes providing and fixing of Heat shrink indoor/outdoor end terminations of 3.5 /4 core LT 1.1 KV grade PVC-A-PVC/XLPE Cables, including providing fixing of Aluminum Solder Less Lugs & glands of suitable size with all required materials.
- The work includes all labour, tools tackles, indoor/outdoor heat shrink end terminations kit of approved make and necessary fabrication work on gland plate of the panel as directed by Engineer-in-Charge.

The switchgear to be fixed as follow:

i) **Incomer:** Air Circuit Breaker (ACB) electrical draws out type of 800 Amps, 415V, 50HZ, 4pole 50kA with multi protection relay with Digital multifunction meter - 1 No.

ii) **Change Over Switch:** 800 Amps, 415V, 50Hz with extended terminal with bolted type Bimetallic Connector to connect 240 sqmm to 300 sqmm aluminum cable – 01 Nos.

iii) **Outgoing Feeders:** MCCB 250 Amps, 415V, 50Hz, 36kA (microprocessor based release O/L with Ics= 100% Icu) with extended terminal with Digital multifunction meters with bolted type Bimetallic Connector to connect 240 sqmm to 300 sqmm aluminum cable – 09 Nos.

iv) **Street Light Feeder:** MCCB 125 Amps, 415V, 50Hz, 36kA (microprocessor based release O/L with Ics= 100% Icu) with extended terminal with Digital multifunction meter with Digital Timer with 3 pole 50 Amp power Contactor set – 01 No.

v) **Aux. Supply Feeder:** 4 pole 63 Amp. 10kA MCB - 01 No.

(Make: DPA Approved Make)

TECHNICAL SPECIFICATIONS OF AUXILARY DISRIBUTION PANEL			
Sr. no.	**Technical parameters**	**As Per Specification**	**To Be Filled By The Supplier**
CONSTRUCTIONAL FEATURES			
1	Manufacturer's name	To be specified by supplier	
2	Rated operational voltage	415 V, 3 Ph., 4 wire, 50 Hz, AC	
3	Rated insulation voltage	1.1 KV	
4	Rated short time withstand current	50kA	

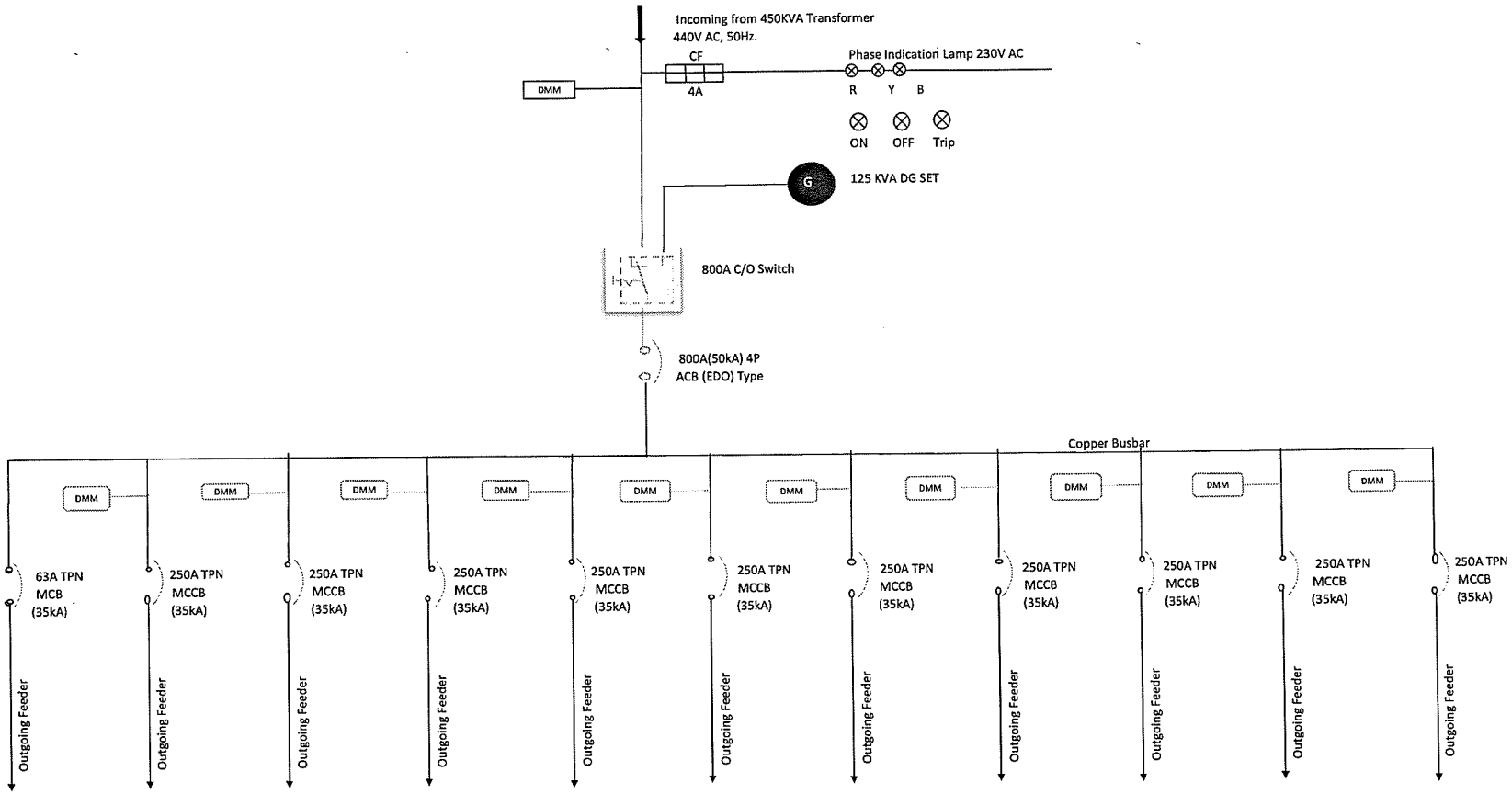
6	Sheet steel thickness	1.6mm (min.) CRCA for doors, 2.0mm for load bearing members and gland plates	
7	Degree of protection for enclosure	IP 52	
8	Compartmentalized single front	Single front	
9	Design Ambient temperature	50° Celsius	
10	Incoming Entry	Bottom	
11	Outgoing cable entries	Bottom	
12	Dimensions (L x B x H)	Approximate dimensions shall be specified	
13	Approx. weight	Approximate weight shall be specified	
14	Paint shade	RAL 7035 / RAL 7032	
15	Min and Max Operating height	300 mm to 1800 mm from bottom of the base channel	
16	Required operating clearances front, sides & rear	To be specified by supplier	
17	Tier formation	Single tier for ACB feeders and multi-tier for others. Width of single vertical shall be 600 mm minimum for ACB feeders, 500mm minimum for MCCB feeders, maximum up to 5 feeders in vertical.	
18	Type of Mounting	Floor mounting with base channel of 75 mm for Power Control Centre (PCC)	
19	Type of termination all O/G cables	Above 100A Bus bar and others thru suitable rating stud type terminals shall be used	
20	Indication lamps	Indication (RYB & ON,OFF,TRIP) lamps at the Incoming and for outgoing (on) indication shall be provided.	
21	Door interlock	To be provided	
22	Minimum clearances in air		
	a) between phases	25.4 mm	
	b) between live parts and ground	19 mm	
23	All feeders shall be provided with ammeter, 3 CT as per tender.	To be provided by supplier	
	BUSBARS		
1	Material for main bus bar	Copper	
2	Cross – section of main bus bar	To be specified by the supplier- for current density 1Amp/sq.mm at rated current	

3	Max Continuous current rating at design ambient temperature of main bus bar inside the chamber	85^0 C	
4	Bus connections to circuit breakers	As per rated currents of circuit breakers	
5	Rated short circuit current	35 KA	
6	Rated insulation voltage for Insulator supports	To be specified by supplier	
7	Material of main bus bar supports	To be specified by supplier	
8	Materials of earth bus bar	GI 50 x 6 mm (min.)/ Aluminum 50 X6 mm for PCC	
	AIR CIRCUIT BREAKER		
1	Make	DPA approved make	
2	Type	To be specified by supplier	
3	Type of breaker	Fully draw-out, air break	
4	Ambient temperature	50 degree centigrade	
5	Rated insulation voltage	To be specified by supplier	
6	Breaker rating	As per Single line Diagram	
7	Rated short-circuit making capacity	105 KA (peak)	
8	Rated ultimate short circuit breaking capacity	50 kA.	
9	Rated service short-circuit breaking capacity	50 kA	
10	Rated short time withstand current	50 kA for 1 Sec.	
11	Type of release Microprocessor based, protection functions O/C/SC/EF with options for both for inverse & definite time	The ACB- shall be Microprocessor based E/F, IEF, O/C, & S/C releases and shall be 4 pole for all incomer in PCC. The ACB shall be electrically operated, motorized spring charging along with manual spring charging in cases of electrical failure. Model no & relevant catalogues shall be submitted	
12	Rated current of over current trip device	To be specified by the supplier	
13	Features of o/c trip device	To be provided	
14	Function blocking selection	To be provided	

16	Self-test facility with breaker in isolated position	To be provided	
17	Visual indication for self-check	To be provided	
18	Site selectable inverse/definite time characteristic for E/F and S/C	To be provided	
19	Type for I/C feeders operation	Motorized	
20	Type for O/G feeders	MDO/ EDO as per SLD	
21	Trip free design	Trip free, stored energy	
22	Electrical and mechanical anti-pumping feature.	To be provided	
23	Auxiliary supply for Voltage & permissible range for spring charging motor, CLOSING & TRIPPING COIL	110 V, 1 Ph., 50 Hz., AC. Range : 70 – 110 % for trip coil, 80-100% for closing coil & spring charging	
24	Mechanical indicator for Spring charged / discharged, electrical indication for ON/OFF/TRIP	To be provided	
25	Shunt trip	To be provided in PCC	
26	Utilization category	B	
27	Quantity and rating	As per Tender	
MOULDED CASE CIRCUIT BREAKERS (MCCBs)			
1	Make	DPA approved make	
2	Type	Air break	
3	Rated insulation voltage	To be specified by supplier	
4	Rated ultimate breaking capacity	35KA / 25KA	
5	Rated short circuit braking capacity	105 kA	
6	Rated service short-circuit capacity	35KA / 25KA	
7	Protective device type	The MCCB - shall be Microprocessor based O/C, & S/C releases for All incomers and outgoings in PCC/AC/ Heater panels. Model no. & make	

9	Utilization category	B	
10	Visual indication for status (LED indication ON/OFF/TRIP)	To be provided	
CURRENT TRANSFORMERS			
1	Make	DPA approved make	
2	Type	Tape Wound	
3	CT secondary	5A	
4	Accuracy Class for Metering	1, ISF < 5	
5	One minute p.f. Withstand voltage	2.5 kV RMS	
6	Burden	10 / 5 VA	
7	Applicable standards	IS : 2705 (1992)	
Ammeters / Voltmeters/MFM meters			
1	Make	To be specified by supplier	
2	Type	Digital	
3	Accuracy class	Cl-1	
4	Size	96 x 96 mm	

Auxilury Distribution Panel Located at Electrical Control Room



LT Main Distribution Panel and Auxiliary Distribution Panel

1. Equipment Ratings

1.0.1 Voltage and Frequency

The low voltage switchgear and control gear ratings are defined on the individual data sheets.The equipment shall be capable of proper operation for voltage deviations of +/- 10% and frequency deviations of +/- 2%. In addition, contactors and relays shall be able to ride through voltage dips to 80% nominal, such as those experienced during motor starting. This system will be a 3 phase,4 wire.The switchgear shall be rated at 415V AC, 50Hz.

1.0.2 Component Ratings

The type of components,number of poles/wires, voltage, frequency, trip or current ratings, and interruption capacity of the equipment shall be as specified in this document,on the datasheets or single line diagrams. The rating of each component shall be based on its installation in the switchgear or control gear assembly.Supplier shall provide de-rating information for all circuit breakers, starters, combination contactors,fused switches,and other components.Equipment of the same type,current rating, and circuit duty shall be interchangeable.

1.0.3 Short Circuit Breaking Capacity

The minimum short-circuit breaking rating of all low-voltage circuit breakers shall be such that the short circuit service breaking capacity must be equal to the percentage of the ultimate short circuit breaking capacity as specified on the datasheet.

1.0.4 Rated Short-Circuit Withstand Current

The rated short-circuit withstand current (Icw) for all applicable components shall be equal to the short-circuit service breaking current with a time duration as specified on the data sheet.

1.0.5 Short Circuit Making Capacity and Power Factor

The rated short-circuit peak making capacity of a circuit-breaker shall not be less than its rated ultimate short-circuit breaking capacity, multiplied by the factor n based on IS 13947.

1.0.6 Bus Short Circuit Ratings

The bus bracing shall be capable of withstanding the mechanical and thermal effects of the maximum short-circuit withstand current and time, as specified on the data sheets, without damage or deformation, applied when the bus bars have reached thermal equilibrium with rated continuous current, at maximum ambient temperature.

1.0.7 Power Bus Current Ratings

Power bus bars shall be rated for the continuous current carrying capacity specified on the data sheets and single line diagrams. Unless otherwise noted, horizontal bus bars shall be of the same current rating throughout their length. All vertical bus bars shall have the same current rating throughout the switchboard.

1.0.8 Short Circuit Protective Device Ratings

1.2 Enclosure

1.2.1 Construction

The switchgear shall contain a number of enclosures erected vertically to form a complete assembly with provisions for future extensions. Front and rear access shall be hinged doors. The switchboard shall comprise of standard prefabricated, cold rolled, sheet steel units of thickness not less than 2 mm (14 SWG)

The height of the switchboard shall be uniform throughout the length of the panel and shall not exceed 2400 mm. However height of the switchgear handle should be above 300 mm but below 1800 mm to facilitate easy operation without the aid of stool. Depth of the panel shall be adequate to gland all the incoming and outgoing cables.

The switchgear shall be provided with bottom cable entry facility with a 3mm thick removable gland plate with gasket.

1.2.2 Component Access

All components shall be easily accessible for maintenance. Front access only gear shall have all components and cable connections easily accessible from the front.

1.2.3 Number of Units per vertical section

The number of circuit breakers or motor controllers in a vertical tier shall be as per the supplier's standard design, unless specified otherwise.

1.2.4 Form of Separation

Switchgear and control gear shall have a form of internal separation as specified on the data sheet, based on IS 8623-1. Sheet-steel barriers shall be provided between the vertical sections and between the control compartments and the power compartments. Horizontal and vertical buses shall be isolated such that when the rear panel of a vertical section is open, the only exposed "live" bare parts will be the load terminals of feeder breakers.

1.2.5 Testing for Arc Due to Internal Fault

The equipment shall be designed and tested to meet the requirements of IS 8623 for arcing due to an internal fault such that the arc is confined in the section where it occurs and adjacent sections are not affected.

1.2.6 Ventilation

The enclosure shall be naturally ventilated. Non-ventilated or forced air cooling shall not be permitted unless approved by the Purchaser. When a transformer, variable speed drives (VSDs), or other heat producing equipment will be installed within the gear, Supplier shall provide internal heating calculations. Internal heat dissipation data shall be provided by the Supplier in any case.

1.3 Power Bus

Power Bus Bars

Power bus bars shall run the entire length of the equipment except where it is necessary to cut and provide splice plates for shipping sections. All primary and secondary bus elements shall be insulated

manufactured in accordance with IS 8623. All bus bar ends shall be drilled and supported to enable extension without modifications to the existing bars.

1.0.8 Neutral Bus Bar

The neutral bus bar shall run parallel with the power bus bars, run the length of the equipment, and shall be fabricated and plated with the same material as specified for the power bus. Neutral bus bar current ratings shall be equal to the phase bus bar current rating in vertical and horizontal bus bar system. The neutral conductor shall be marked 'N' and colored black and the earth conductor marked 'E' and twin colored, green/yellow. The terminals for external earth conductors shall be marked with the standard earthing symbol.

1.0.9 Joint and Bus Plating

All joints between vertical and horizontal power buses, multiple horizontal buses, and incoming connections shall be plated with tin or silver. All un-insulated bus shall also be plated with the specified material. Bus bar joints shall be made using high-tensile steel bolts (hydrogen relieved), nuts and washers. Provision shall be made in the bus bar compartment to allow access for inspection and maintenance of connections.

1.0.10 Bus Insulation

Unless specified as none (i.e. air insulated), power bus bar and neutral bus bar insulation shall consist of physical barriers between phases(isolated) or complete encapsulation with suitable dielectric material (fully insulated). For full insulation, the entire length of the power bus (i.e. horizontal and vertical sections including the neutral) shall be insulated for the rated voltage. Material and instructions necessary for insulation of all bus splices, connections, and terminations shall be supplied with the equipment. The bus bar insulation shall be continued into the main switching device compartment as far as practicable whereas the main and dropper bus bar insulation system shall use flame retardant, non hygroscopic and non-tracking material

1.0.11 Bus Bar Connections

Bus connections to and from circuit breaker units, fused units, or motor starters shall be insulated, as specified on the data sheets, and shall have a short circuit rating at least equal to the maximum specified short circuit current. The bus connections to the circuit breaker and fused units shall have a continuous current rating at least equal to the largest breaker or fuse which may fit into that particular section. The continuous current rating of the motor starter bus connections shall be equal to the maximum current drawn by the largest starter of the size that may fit into that particular section. Minimum Clearance between Phase to phase shall be 25 mm, Phase to Earth & Phase to Neutral shall be 19 mm

Shutters for Bus Contact Openings

Automatic shutters shall be provided for functional units, so that when a unit is removed, disconnected, or placed in the 'TEST' position, no live primary-circuit elements will be exposed. Each set of shutters shall be individually operated and activated by the movement of the withdrawable unit and shall not depend on gravity for operation. All shutters shall be pad lockable in the closed position. The bus contact openings for all withdrawable units shall automatically have an internal degree of protection the type of protection shall

1.0.12 Warning Labels

All covers providing access to bus bars shall carry a 'Caution – Risk of Electric Shock' warning label.

1.0.13 Phase Identification

Bus bar phase identification shall be R, Y, B, and N. Phase arrangement and primary circuit connections shall be clearly shown on Supplier's drawings.

1.0.14 Wiring

No wiring shall be contained within bus bar compartments, other than the phase connections to incoming and outgoing main circuits.

1.1 Earthing Bus Bar

1.1.8 Description

All switchgear and control gear compartments shall be earthed to a common earthing bus bar running the full horizontal length of the assembly fabricated from the material and sized as specified. Vertical earth bars shall be provided. The minimum area of the earthing bus bar shall be as specified on the datasheet. The earth bus bar material shall be tin plated copper.

1.1.9 Connections

The earth bus in each vertical section shall have at least six pre-drilled holes for terminating earthing conductors. All internal earthing connections shall be made at the factory.

1.1.10 External Cable

Each gland plate shall be bonded to the earth bus by connection complying with IEC 61439.Provision shall be made within each cable box for connection of all external cable earth cores.

1.1.11 Panel Earthing

Each end of the panel shall be earthed to the main earth grid. Supplier shall extend the earth bus outside of the panel for purchaser connect to the main earth.

1.1.12 Door Earthing

Each compartment door shall be earthed separately.

1.2 Wiring

1.2.8 General

All conductors shall be stranded copper with flame retardant, 600/1000 V insulation and continuous from terminal to terminal with no splicing. Conductor ends shall be fitted with a crimped terminating device with an insulated shank. Wiring shall be neatly bundled and secured with wire ties. Minimum conductor sizes for current transformer, for power circuits, for control circuits and for signal wiring to electronic instruments, shall be as per the data sheets.

1.2.9 Wire Markers

requisition documents. Wrap-around, adhesive, and Snap-On markers are not acceptable. All wiring shall be marked on each end of the conductors with permanently-embossed wire markers of the heat shrinkable or slip on types.

1.2.10CT Wiring and Protection

All CT circuit wiring shall be provided with a screw-type terminal and ring lugs. Where wiring passes through a metal sheet or barrier, bushings, grommets, or other mechanical protection shall be provided. Wiring across door hinges shall be protected from mechanical damage, preferably by the use of flexible conduit. CT mounted on the buses shall be supported and clamped adequately. CT shall be Cast resin type.

1.2.11Earthing Wire

All earth circuit wiring shall have green/yellow insulation. The instrument compartment door should be earthed with flexible braided copper wire.

1.2.12Power Supply Wiring

Wiring for circuits connected to bus-wired power supplies shall be protected by molded case circuit breakers or fuses for each switchgear unit.

1.2.13Inter-Wiring Ducts

All switchgear inter-wiring for interlocking, alarms, etc., shall be routed between compartments by means of a duct. Wiring ducts shall be accessible without the need to de-energize any circuits.

1.2.14LSF Wiring and Ducts

All internal wiring shall be low smoke and fume (LSF) type wiring. Insulation shall be low smoke, zero halogen thermosetting insulation with an oxygen index of 30% minimum. All internal wiring ducts shall also be fabricated from LSF material.

1.2.15Auxiliary Circuits of Draw out Units

The connections of the auxiliary circuits of draw-out units shall be of the plug-and- socket type, automatically operated by the unit.

1.2.16Cable Screening and Segregations

The following cable segregation requirements shall be observed during construction of the switchboard:

a) Low voltage, digital and analogue I/O cables shall be loomed separately from, and have maximum separation to main voltage cables.

b) Unless approved by the Purchaser, all communications shall be run using screened twisted pair or fiber-optic cabling.

c) Analogue signals not transmitted over the communications network shall be run via screened twisted pairs. Single wiring within equipment shall be manually twisted in pairs, with due care taken to minimize the length of any untwisted wiring.

d) Incoming digital I/O (Input/Output) cables to the Intelligent Motor Controller (IMCS) shall be screened.

e) Signal Cable screens shall only be single point earthed at the switchboard end. The screen to instrument earth bar connections shall be as short as practical. Screens on different analogue signal pairs shall be kept isolated

1.3 Name Plates

1.3.8 General

Nameplates shall be placed on the outside of each cubicle door identifying the service by name and equipment number in accordance with the datasheets. All external nameplates shall be of an acrylic resin material. The language used shall be English and the background of the nameplate should be white with black letters to be used. The nameplate size and letters' height should be of the supplier's standard.

1.3.9 Fastening

Nameplates shall be attached to the enclosure by two stainless steel screws. Adhesive backing shall NOT be permitted unless approved by the Purchaser.

1.3.10Component Nameplates

Nameplates shall identify each device on the instrument panel and other devices such as instrument transformers, secondary fuses, etc. inside the cubicle. Door- mounted components shall be identified both on the exterior panel door and internally. The positions of control and selector switches shall also be labelled. Nameplates shall remain in place when the component has been removed.

Warning and Caution Nameplates

In locations where dangerous situations may inadvertently be created, warning plates or caution notices shall be installed, identifying the danger points. This may be in a compartment or on the outside of an assembly. Warning plates or caution notices shall be engraved black lettering on yellow background. Applications include, but are not limited to the following:

a) Incoming sources with potential for feedback from an alternate source.

b) Termination points for all wiring brought to the switchgear from an external power source.

1.3.11Danger Nameplate

Nameplate shall be engraved white latter on red background. The Nameplate shall comply with IS 2551.

1.4 Electrically Operated Circuit Breakers

1.4.8 General

The switchgear circuit interrupting device shall be of the draw out, air break, electrical type, with five-cycle closing and interrupting duty, and solid-state trip unit with long-time, short-time and/or instantaneous, and earth fault protection as specified in this document, the datasheets, or single line diagrams. The utilization category for circuit breakers as per IS 13947 shall be Category B, suitable for continuous duty.

1.4.9 Electrically Operated Breakers

Switchgear main and tie circuit breakers shall be electrically operated. Electrically operated feeder circuit breaker shall be provided only when indicted in data sheet or Single Line Diagrams. Electrically operated circuit breakers shall have means of tripping when control power is not available. On electrically-operated circuit breakers, secondary disconnecting devices shall be provided for auxiliary functions and control circuits.

Circuit breakers shall be withdrawable to an isolated test position or disconnected position or completely withdrawn from the breaker cubicle. In the test position, the breaker shall be operable (with auxiliary circuits energized) but shall not energize the power circuit.

1.4.11Interchangeability

Breakers shall be interchangeable with others of the same voltage, current, and breaking ratings. It shall not be possible to interchange breakers of different ratings.

1.4.12Breaker Spring Charging

In addition to electrical spring charging using a motor, on the breaker control panel (face of the breaker), a handle for manually charging springs, a contact-position indicator, a charging mechanism position indicator, and pushbuttons for closing and tripping shall be provided. Spring mechanisms shall be arranged such that a closing operation cannot occur until the spring is fully charged.

1.4.13Breaker Mechanism

Operating mechanisms shall be electrically and mechanically trip free, include an anti-pumping device, incorporate a local manual trip facility, and give positive indication of breaker position. Tripping mechanisms shall be provided with a mechanical tripping device. Operating mechanisms equipped for electrical closing shall include an interlock arranged such that closing cannot be initiated when a trip condition exists.

1.5 Control Switches, Push buttons and Indicating Lights

1.5.8 Instrument Switches

Pushbuttons and related control switches shall comply with IS 13947. All pushbutton switches, except stop switches shall have a full shroud to prevent inadvertent operation. Instrument switches shall be rotary-cam type with engraved dial plates. Switch escutcheon plates shall be clearly marked to show operating positions.

1.5.9 Circuit Breaker Controls

A circuit breaker control switch and a set of contact position indicating lights shall be provided on the cell door of each electrically operated circuit breaker. The switch handle shall be located along the vertical center line of the cubicle and shall not be located adjacent to meter switches.

1.5.10 Operating Handles

When the switchgear is equipped with several operating controls requiring manual operating handles, these handles shall be of different physical size and shape to minimize the possibility of operating errors, as specified.

1.5.11 Indicating Lights

All indicating lights shall be multi-LED type, providing long life capacity, and shall be removable from the front panel.

The indicating lights for circuit breakers shall be:

a) RED "ON" when breaker is closed

b) GREEN "ON" when breaker is opened

c) WHITE "ON" when indicating trip circuits/lockout relays are operational (healthy)

The indicating lights for motor feeders & contactors shall be:

a) RED "ON" when contactor is closed (motor running or Feeder ON)

b) GREEN "ON" when contactor is opened (motor stopped or Feeder OFF)

c) AMBER "ON" when contactor tripped (indicates trip by device other than control switch).

Technical Specification No.05:

The work includes SITC of L.T Outdoor type feeder pillar. The LT feeder pillar panels to be used for conversion of overhead power distribution network to underground Cable network at Vadinar colony, including supply of all Equipments/Materials, Erection (including Civil Works), Cable Termination, Testing and Commissioning. The Feeder Pillar shall conform to the specific Technical installed requirement specified hereunder.

1. Rated Voltage - 415 V + 10%
2. Rated Frequency - 50 HZ
3. Continuous Current Rating - 250 Amps
4. Type - Out door
5. Mounting - On concrete foundation.
6. Suitable for - 3 ph 4 wire with earthed Neutral
7. Maximum system Voltage - 1.1KV
8. Rated short Circuit Level – 35kA @ 400V.

Feeder Pillar Box shall be suitable for the purpose for which we are intended to be used. Each feeder pillar shall be complete with following accessories:

i) 4 Pole MCCB 200 Amps, 415V, 50Hz, 35kA with extended terminal series -01Nos.

ii) Electrolytic copper bus bar of suitable size.

iii) Digital timer with 24 hrs. day time setting with LCD display-1No.

iv) Three phase contactor of 415v, 50HZ, 50Amp coil voltage 415v AC.-1No.

v) 4Pole MCCB 125 Amp D series, 25/35KA, 415volts, 50 HZ Din mounting-06Nos.

vi) Bolted type Connector strip for connecting Incoming/Outgoing cable suitable for connecting 16 sq.mm to 120 sq.mm aluminum cables. The work includes all material & labour required shall do as directed by Engineer-in-charge.

vii) Din rail connector for terminating I/C & O/G cables, two no's earth connections, neoprene gasket on doors edge, lock& key arrangement.

viii) Suitable capacity of Ammeter, Voltmeter, Selector switch, Phase indicators.

Feeder Pillar Box shall have access for sufficient ventilation and head description.

The cable entry and exit shall be from bottom of the panel. The design of the panel/box must be such as to facilitate easy removal of the cable during erection and repair by suitable bolting the box cover and sliding the bottom gland plates. The panel shall be provided with suitable gland and clamps for fixing the cable rigidly. The feeder pillar box shall be suitable for 1.1kV 4 core 120sqmm to16 Sq.mm armored UG cable, clearance inside the box must be such as to offer fair working facilities during erection and maintenance. The inside surface of the box shall be insulated by fiber sheet to with stand 1.1 kV insulation to prevent flash over. The box shall be vermin proof and dust proof. Louvers of suitable size shall be provided in the side for ventilation and to prevent the entry of dust and insect. The box shall have **double door** (self-closing type) fitted with internal type door lock with common key for all the boxes and shall give maximum protection to the interior of the box. The feeder pillar boxes shall be made of 2.5 mm thickness CRCA sheet with permanent paint on clean surface after chemical treatment. The Feeder Pillar Boxes shall be provided

The feeder pillar panel shall be designed to work satisfactorily under following service conditions:

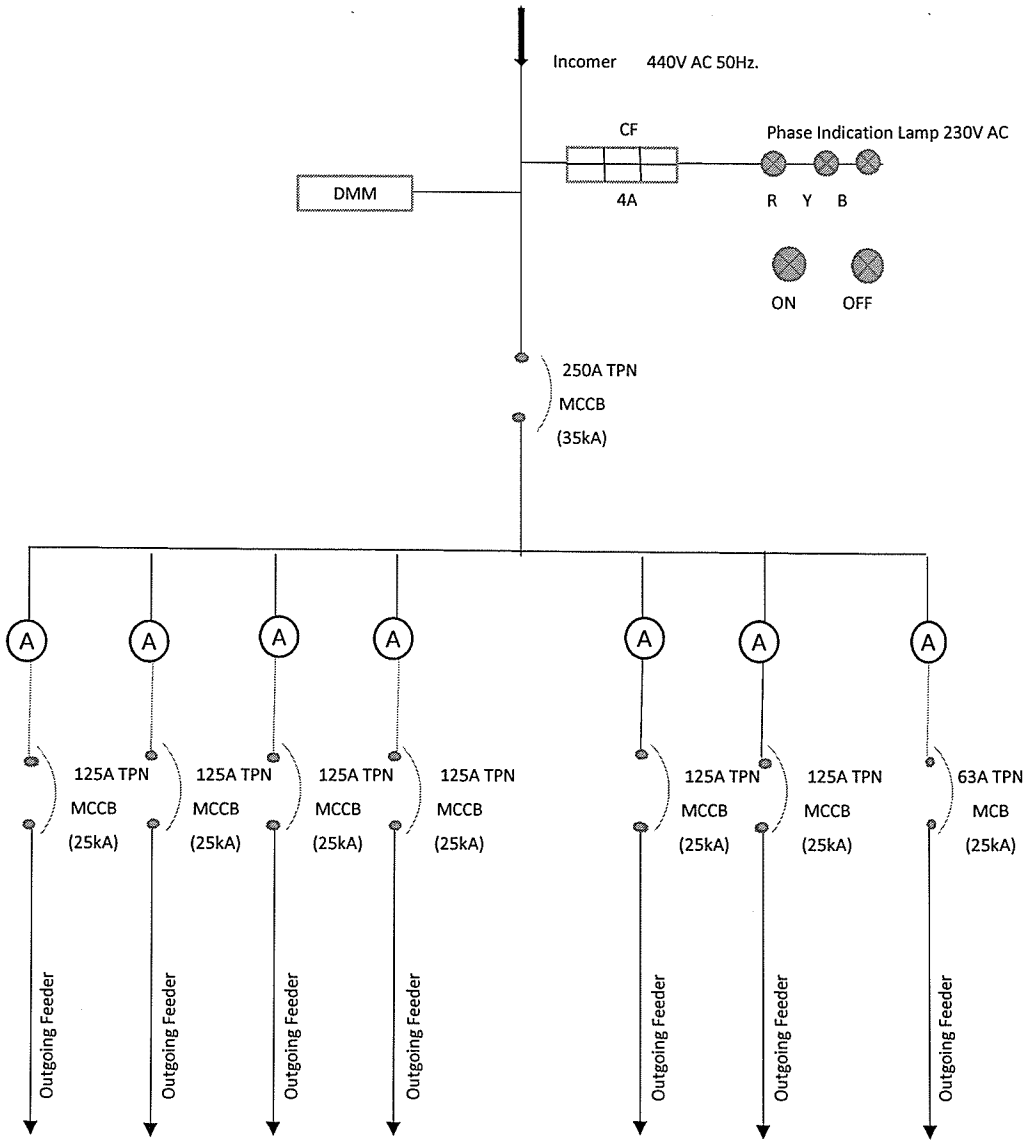
		Indian Standard
	Supply Voltage	3 phase neutral, AC 433Volt +/-10%
	Supply Frequency	50 Hz +/-5%
	Location of panel	Outdoor, on foot path or roadside
	Pollution	Light Polluted and Dry
	Incoming supply to feeder pillar panel	From compact s/s or Main feeder pillar
	Ambient Temperature	Average 45 Deg C, Maximum 50 Deg C

The feeder pillar panel construction shall confirm to following features: -

1	Panel Construction	Free Standing floor mounted with CRCA sheet,
2	Welded Construction	Continuous welding from inside, Spot welding not acceptable.
3	Ingress Protection class for enclosure	IP 66 as per IS 12063
4	Material	CRCA sheet Steel of 304 Grade
5	CRCA Thickness	3mm - Support frames 2mm CRCA. - Covers, Doors & Canopy
6	Base frame for panel	3mm GI Channel 50mm height painted in Black Color
7	Bottom holes on four Sides	Oval Shape, for grouting bolts
8	Cable entry	From Bottom only
9	Lifting Lug	2 nos lug welded on top
10	Canopy on top	With minimum 10 Deg C slope extended 50mm outside panel front and rear
11	Door type for front & rear access	Centre Opening double leaf with insulating rubber grip handle
12	Door Opening angle	Min 120 Deg
13	External hardware	SS nut and bolts
14	Bus bar color coding for R, Y , B and Neutral	Heat shrinkable tape of color Red, Yellow, Blue & Black respectively.
15	Copper Bus Bar size in mm	50X10 mm for R,Y,B & N
16	BUS	Bolted type removable link to be provided at middle of all the phases and neutral bus bar, To adapt two incomers from separate source in case of exigency.
17	Bus bar arrangement	Horizontal, with R phase bus at top
18	Bus Bar support insulators	SMC / DMC, 1100v Grade
19	Cable size main Incoming for panel	4C X 120Sqmm cable Aluminum conductor

21	Gland plate at panel bottom	CRCA, 3mm thick for multi core cable
22	Cable termination clearance from gland plate	300mm minimum
23	Labels for incoming and outgoing feeders	Sticker type labels inside panel door
24	Earth studs on both side of panel bottom	With M10 SS steel nut bolts
25	Flexible earth connection to doors	Flexible PVC Cu wire 2.5Sqmm green color
26	Panel minimum dimensions in mm	Width 1225, Depth 650 , Height 1650.
27	Holder for lamp panel	230v Incandescent lamp controlled through 2amp CB
28	Small power socket for panel	5/15 amp 3pin socket controlled through 16amp SPMCB
29	Marking for panel earth stud	Green letter 'E', on riveted AL label
30	Danger board in English and local language, riveted on doors	Red color background with black lettering on 1.6mm thick Al plate
31	Surface preparation for painting	Sand blasting or 7 tank process
32	Painting	Powder coated grade A polyester paint with min thickness 60 microns
33	Paint shade	Shade – 538 as per IS:5 – Post office red
33	Fluorescent strip painting on panel	50mm wide horizontal strip of fluorescent paint around panel in the middle of panel
34	Tolerances on panel dimensions	Maximum +/- 5mm
35	Caution	No negative tolerance on bus bar dimensions and bus bar clearances.
36	Prototype panel	Prototype panel to be approved by DPA Electrical Dept.

Outdoor Type Feeder Piller Panel



Technical Specification No. 06:

- This includes providing and fixing of Heat Shrinkable Straight through joint to 3.5 /4 core LT 1.1 KV PVC-A-PVC/XLPE Cables, including providing fixing of Aluminum Solder less ferrules of suitable size with all required materials.
- These shall be Heat Shrinkable type jointing kit complete with all the cable jointing accessories of appropriate size suitable for all type of underground cables as specified in the BOQ.
- The joining kit should provide effective and reliable stress control, superior surface protection, and moisture proof, environmental sealing and increased dielectric strength. The kit should meet I.E.C, IEEE –404 VDE 0278 and other International Standard.
- The rate shall inclusive of all labour, tools tackles, taxes, packing, forwarding, insurance, transportation and unloading at site of work etc.

Technical Specification No. 07:

- This includes preparation of earth station with Earthing Rod with below Specification:
  - Earthing Type: Maintenance Free Earth electrode made of steel circular rod with molecularly bonded copper as per IEC 62561
  - Rod diameter:> 17 mm, Copper coating:99% pure electrolyte copper, (iv) Length:> 3 meters / 10 feet.
  - Earth Enhancement Compound Composition: Graphite, Activated Carbon, Al Silicate CU Sulphate & Binding Agent Bentonite etc. Material with below Specification:
  - Chemical bag weight: 25 Kgs 2 bag each
  - Resistivity Value: < 2 Ohm
  - Environment Effects: ECO Friendly (Lead, Cadmium, Zinc Free Compound)
- Earth Pit Cover with below Specification:
  - Material Type: RCC > 300 x 300 mm,
  - Load Bearing Capacity: Up to 5 MT On Ground Level
  - Lid Lock System: Yes
  - UV Resistance: Yes
  - Eco Friendly: Yes
  - Temperature:5°C to 75°C
- A Ready-made earthing chamber of minimum 30 cm x 30 cm shall be provided just below the ground surface and shall have RCC/CI cover of suitable size as directed. This also includes removing excess excavated soil from the site. The work shall be carried out to the full satisfaction of the Engineer-in-Charge. The work includes all labor and materials as directed by the Engineer-in-charge.

Technical Specification No.08:

- This includes supply at site, laying, fixing and connecting of G.I strip of size 25x3 mm from earth station/existing earthing system to H.T/L.T. panel, H.T/ L.T switchgears, Power/Distribution transformer etc. as directed.
- The G.I strip of Single length (without joints) shall be laid from earth station to HT/LT switch gears & transformers etc. directly connected to two separate and distinct main earth as directed and shall be clamped suitably on wall/floor or buried in the ground / pucca trench as directed. The work includes all material

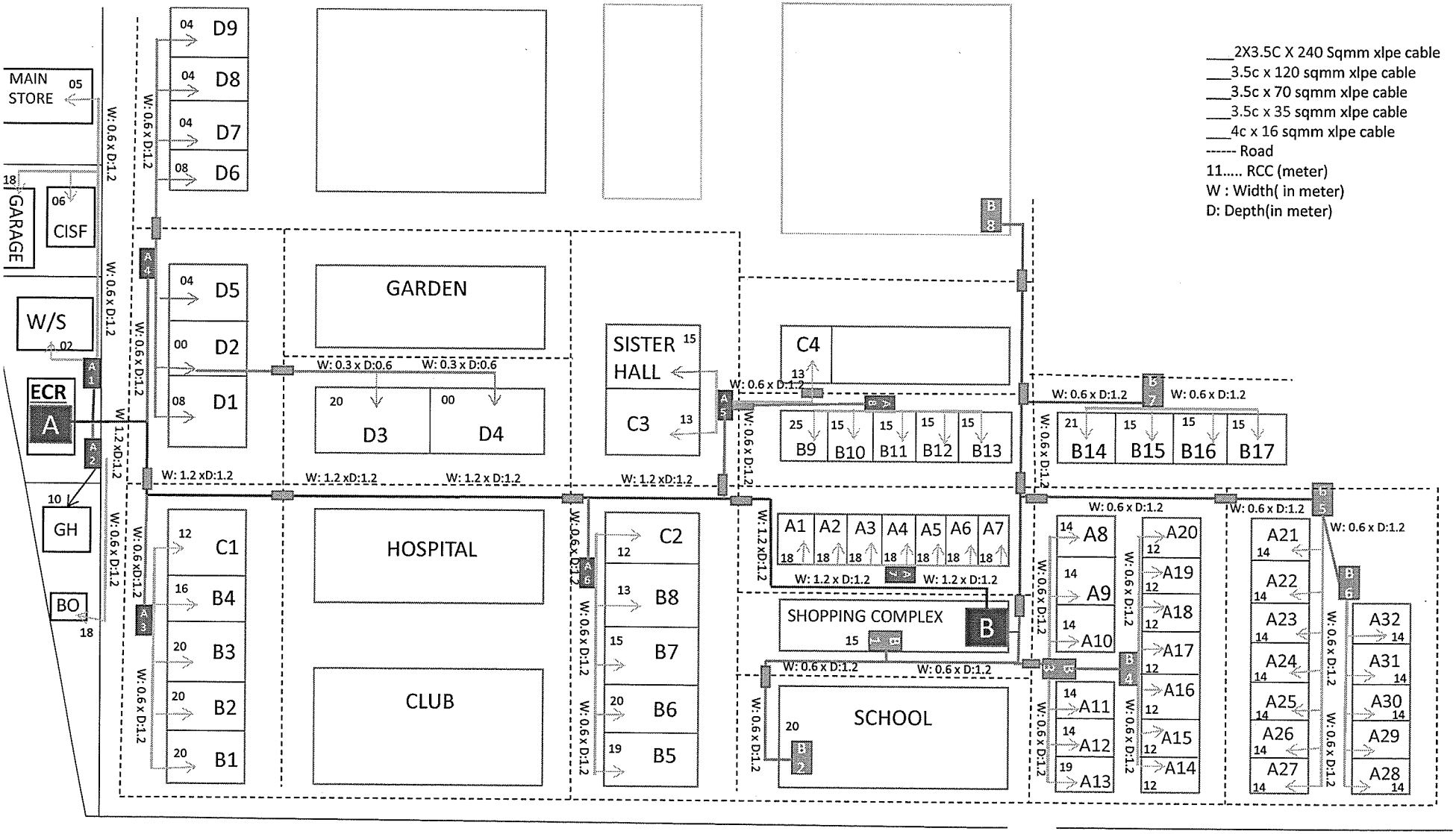
Technical Specification No. 09:

This includes providing foundation with M20 grade PCC mix of proportion 1:1 1/2:3 consisting of ingredients of cement, sand and crushed graded trap stone metal etc. with cantering, shuttering and reinforcement suitable to the design of the Foundation of panel, including mixing, disposing, consolidating, leveling, curing etc.

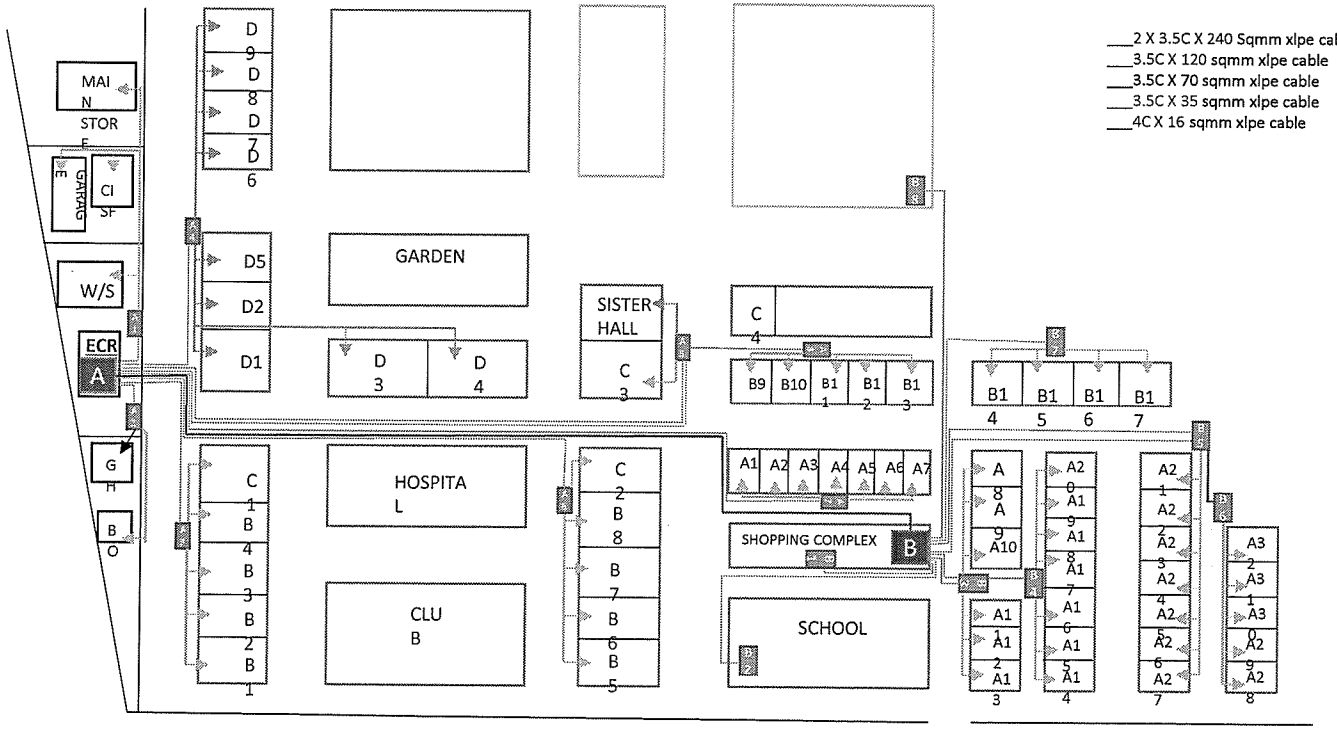
Technical Specification No. 10:

- This item includes Supply, Installation, Testing and Commissioning of Tamper proof, Shock proof and Rust proof SMC (Sheet Moulding Compound) Street light Junction box with 1 no. - 1Pole 6A x 240V rating MCB & 1 no. - 63A 4 way pvc connectors as directed.
- The Junction box shall be in single piece without any joints having concealed hinges, mounting screws fitted from inside, metal hardware for wire seal, light weight and adequate space for fixing the cut outs & connector as directed.
- The size of SMC Junction Box shall be 230mm x 170mm x 105mm from outside. The size of the SMC Boxes above is tentative and minimum. The Contractor shall accommodate the MCB & 4way connector as directed in the box. However, contractor may increase the size if required to accommodate the MCB & connector to the actual requirement and relevant rules and regulations, for that no extra payment shall be made. The rates shall be inclusive of all the taxes, insurance, transportation, unloading, including VAT etc.
- This includes fixing of supplied Shock proof and Rust proof SMC (Sheet Moulding Compound) Street light Junction box on wall / structure / Pole as directed. The Junction Box shall be fixed rigidly on pole through suitable size of nut bolts / anchor fasteners / cemented wooden gutties and incase of pole it shall be fixed through suitable size of G.I. clamp at least 2mm. thick as directed. This includes with all material, labour tools & tackles including necessary wiring & connections with earth linking as directed by Engineer-In-charge

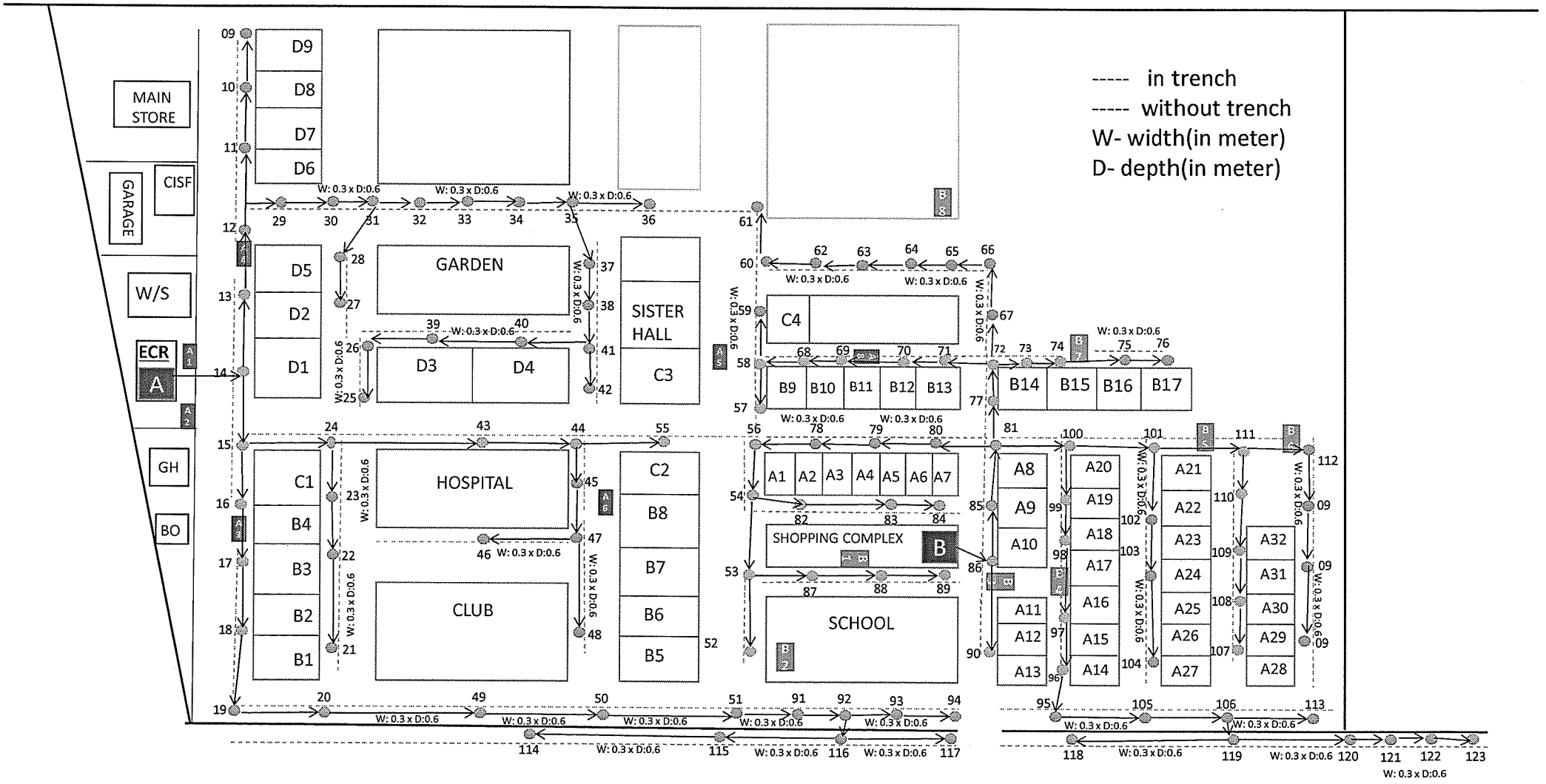
Layout of Cable Trench Excavation Work Of DPA Colony



Layout of Cable Laying of DPA Colony



Layout of Street Light Cable Laying of DPA Colony



Approved Make List for Electrical Items

Sr. No.	Description	Recommended Makes
1	HV VCB	SIEMENS / CROMPTON GREAVES/ABB/Schneider
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/ NICCO/GLOSTER/ UNISTAR/ UNIVERSAL / RAVIN-PRIME CAB
6	LT XLPE CABLES	POLYCAB/TORRENT/RPG ASIAN/ NICCO/ RALLISON/PRIMECAB/ HAVELLS/ UNIVERSAL/ UNISTAR/AVOCAB/ ADCAB /ATLAS
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/C&S
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/C&S
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 / C&S

18	MULTI FUNCTION DIGITAL METER FOR MAIN LT DISTRIBUTION PANELS/DIGITAL KWH METERS	L&T/ENERCON/SECURE/L&G/ RISHABH
19	ANALOG VOLT/AMPARE METER FOR DISTRIBUTION PANELS AND FEEDER PILLERS	RISHABH/AE/ENERCON/L&T
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	POLYCAB/MILEX/GUJCAB/ STANDARD/ FINOLEX/ANCHOR
24	FLUSH TYPE SWITCHES, SOCKETS, HOLDERS AND CEILING ROSES & ELECTRONIC REGULATORS	ANCHOR/MK/NORTHWEST
25	DOOR BELLS/CALL BELLS	ANCHOR/LEGEND/MK/NORTHWEST
26	MODULAR SWITCHES, SOCKETS, PLATES & BOXES	ANCHOR / MK / NORTHWEST / LEGRAND /
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 /

31a	LED Luminaries	Philips /Bajaj/Wipro/CG/Surya/Pyrotech/Syska/Nessa/ C&S having surge Protection ≥10KV for fittings & internal Surge Protection for DSea 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
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

Sign & Seal of Contractor

Executive Engineer (M&E)
Deendayal Port Authority.