DATA SHEETS- ELECTRICAL WORKS

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Note:	
1.0	Technical Schedules cover only salient features of equipment offered by the Contractor. The Contractor shall certify that the specification requirements as covered in VOLUME-II are fully complied with, except those specifically brought out in Schedule of Deviations from Technical Specification.
2.0	For (*) items, Bidder to provide Quantity/ Ratings based on Design Criteria & Specification requirements. Ratings & Configuration, wherever specified (in Technical specifications/ Data Sheets/ Price Schedule/ SLD) for equipments, shall be minimum requirements. Electrical Switchgears/ Distribution Board Configuration (components/ equipment/ protections/ metering/ instruments) shall be as per indicated in typical reference SLDs & in line with design criteria & specification requirements.
3.0	Bidder to provide completely filled data sheets for the below mentioned equipments. As applicable, separate data sheets needs to be filled for each equipment/ system covered under Sewage pumping Scheme.

1.0 11 KV TWO / FOUR POLE STRUCTURE:

a) For installed (1W+1S) transformers cumulative rating ≤ 800 KVA, Four Pole Structure/ 2 Nos. of DP structures complete with all accessories as per requirement.

(A) LIGHTNING ARRESTERS:

Data sheet for 11 kV as Supply voltage, to be confirmed with MGVCL/GEB

Sr. No.	Description	Unit	Particulars	To be confirmed by Bidder
1.0	General			
1.1	Designation		Lightning Arrester	
1.2	Make		As per approved make list	
1.3	Applicable Standards		As per Tender Specification	
1.4	Type		Station Class type	
1.5	Quantity (Min. 3 nos. per D.P.Structure)	Nos.	As Per Requirement	
1.6	Installation		Outdoor	
1.7	System voltage, No of Phases & Frequency	kV	11kV, 3 Phase & 50 Hz (To be confirmed with MGVCL/GEB)	
2.0	Ratings			
2.1	Rated arrester voltage	kV	9	
2.2	Rated frequency	Hz	50	
2.3	Nominal discharge current of 8/20 microwave shape (Station class)	KA	10	
2.4	Basic Insulation level of equipments to be protected			
a)	Impulse withstand (1.2*50 micro sec)	KV(P)	75 (for 11 kV)	
b)	1 min. Power frequency withstand voltage	KV	28 (for 11 kV)	
2.5	Terminations - Clamps & Connectors suitable for ACSR conductor provided		Bidder to provide	

Sr. No.	Description	Unit	Particulars	To be confirmed by Bidder
3.0	Arrestor housing			
3.1	Minimum creepage distance	mm	25 mm / kV	
3.2	Minimum cantilever strength of arrester assembly	kN	Bidder to Furnish	
4.0	GA drawing Indicating Height, Weight, overall dimensions and mounting arrangement details		Bidder to Furnish	

(B) ISOLATOR (G.O.D)

Data sheet for 11 kV as Supply voltage, to be confirmed with MGVCL/GEB

Sr. No.	Description	Unit	Particulars	To be confirmed by Bidder
1.0	General			
1.1	Designation		Isolator (Gang Operated Disconnectors)	
1.2	Make		As per approved make list	
1.3	Applicable Standards		As per Tender Specification	
1.4	Type		Vertically mounted Double Air Break Central Rotating Type	
1.5	Quantity (1 Set per D.P.Structure)	Sets	As Per Requirement	
1.6	Installation		Outdoor	
1.7	System voltage, No of Phases & Frequency	kV	11 KV, 3 Phase & 50Hz	
2.0	Design Requirements			
2.1	Ambient temperature	°C	50	
2.2	Rated Current	*A	As per System Requirement	
2.3	Short Time Rating	KA	Rating to be calculated based on utility feed	

Sr. No.	Description	Unit	Particulars	To be confirmed by Bidder
2.4	Insulation level	Full/ Reduced	Full	
2.5	Phase spacing as per IS/CBIP & to suit BIL & Lightning Impulse Voltage	*mm	Bidder to Furnish	
2.6	Earthing switch required to be provided and interlocked with main switch		Yes	
2.7	Height of mounting above GL	mm	As per IS/CBIP	
2.8	Operating device for Isolator with Earth Switch – Manual with Operating handle with reduction gear and suitable electro-mechanical interlock.		Yes	
2.9	Orientation of operating mechanism box W.R.T isolator		Suitably mounted on DP	
2.10	Auxiliary contacts (6NO+6NC) Make before break		Yes/ No	
3.0	Insulator Data			
3.1	Rated voltage	kV	11 (To be confirmed with MGVCL/GEB)	
3.2	1 min. Power frequency wet flash-over voltage	kV	28	
3.3	Impulse flash-over : Positive wave(1.2*50 micro sec)	kV (peak)	Bidder to Furnish	
3.4	Impulse withstand (1.2*50 micro sec)	kV (peak)	75	
3.5	Creepage distance	mm	25 mm per kV	
3.6	Minimum Cantilever strength	kN	Bidder to Furnish	
4.0	GA drawing Indicating Height, Weight, overall dimensions and mounting arrangement details		Bidder to Furnish	

(C) DROP OUT FUSE (D O FUSE)

Data sheet for 11 kV as Supply voltage, to be confirmed with MGVCL/GEB

Sr. No.	Description	Unit	Particulars	To be confirmed by Bidder
1.0	General			
1.1	Designation		DO Fuse	

Sr. No.	Description	Unit	Particulars	To be confirmed by Bidder
1.2	Make		As per approved make list	
1.3	Applicable Standards		As per tender specification	
1.4	Type			
1.5	Quantity(1 per DP Structure)		As Per Requirement	
1.6	Installation		Outdoor	
1.7	System voltage, No of Phases & Frequency	kV	11 KV, 3 Phase & 50Hz (To be confirmed with MGVCL/GEB)	
2.0	Rating			
2.1	Rated Current	*A	Bidder to Furnish	
2.2	Insulator Rating Insulator Creepage Distance Insulator Impulse withstanding		12 kV Porcelain 25 mm / kV As per relevant IS	
2.3	Fuse Carrier		Bakelite Tube	
2.4	Contacts		Spring Loaded Phosphor Bronze	
3.0	Operating Mechanism		12 KV, 4 element type operating rod	
4.0	Connection Details		ACSR Conductor	

2.0 DISTRIBUTION TRANSFORMER

Sr. No.	Description	Unit	Particulars	To be confirmed by Bidder
1.	Manufacturer's Name And Country Of Manufacture		Bidder To Furnish	
2.	Applicable Standards		As Per Specifications	
3.	Quantity	Nos.	Refer Price schedule.	
4.	Application / Designation		Distribution Transformer	
5.	System Voltage			

	- Nominal - Highest	kV kV	11 12 (To be confirmed with MGVCL/GEB)	
6.	Method of Connection HV Winding LV Winding		 Delta Star	
7.	Rated Frequency	Hz	50	
8.	Type Of Winding / Material		Two Winding / Copper	
9.	3 Phase / Single Phase Unit		3 Ph Unit	
10.	Rating Of Each Unit	KVA	* KVA	
11.	Voltage Rating	KV/ KV	11 / 0.433 (To be confirmed with MGVCL/GEB)	
12.	Cooling		ONAN	
13.	Percentage Impedance at Principal Tap & Without Negative Tolerance	%	As Per IS 1180-2014 & Its latest amendment	
14.	Over fluxing Withstand Capability		(110% Continuous)	
15.	Vector Group		Dyn11	
16.	Winding Insulation (HV & LV)		(Uniformly Insulated)	
17.	Short Circuit Current	kA	Rating to be calculated based on utility feed	
18.	Maximum Duration Of Fault	Sec.	1 Sec	
19.	Insulation Withstand Voltage			
a)	1 Min Power Frequency Withstand Voltage (Dry & Wet) - HV (11 kV)/ LV (0.433 kV)	kV	28/ 3	
b)	Lightning Impulse Withstand Voltage - HV (11 kV)/ LV (0.433	kV	75/ NA	

	kV)	(Peak)		
20.	TEMPERATURE RISE (H Factor of Max. 1.3 as Per IEC 60354 to be considered)			
a)	Maximum Ambient Air	^{0}c	50	
b)	Yearly Average Air (Minimum)	^{0}c	32	
c)	Temperature Rise Of Top Oil By Thermometer(Maximum)	^{0}c	50	
d)	Maximum Temperature Rise Of Windings By Resistance (Maximum)	^{0}c	55	
e)	Hot Spot Temperature (Maximum)	^{0}c	98	
f)	Loading Combination For Which Above Temperature Rises Are Applicable			
21.	Weights		Bidder To Furnish	
a)	Core Winding Assembly	Kg		
b)	Oil	Kg		
c)	Tank, Coolers And Fittings	Kg		
d)	Total	Kg		
e)	Un-tanking Weight	Kg		
f)	Minimum Clearance Height for Lifting Core And Windings From Tank	mm		
22.	Maximum Flux Density			
a)	At Rated Voltage	Wb/M^2	1.6	
b)	At 110% Rated Voltage	Wb/M^2	1.76	
23.	Current Density		Bidder To Furnish	
a)	HV	A/Cm^2		
b)	LV	A/Cm^2		

24.	GUARANTEED LOAD LOSSES AT RATED CURRENT AT 75ºc WINDING TEMPERATURE (WITHOUT IS POSITIVE TOLERANCE) i) 100% LOAD ii) 75% LOAD iii) 50% LOAD	KW	Minimum 3 Star Rated Transformer As Per IS 1180-2014	
25.	Guaranteed No Load Losses (Core Loss And Dielectric Loss) At 100% Rated Voltage And Frequency (Without Is Positive Tolerance)	kW	Minimum 3 Star Rated Transformer As Per IS 1180-2014	
26.	Guaranteed No-Load Current: A. When Excited From LV Side At 100% Rated Voltage B When Excited From LV Side At 110% Rated Voltage	A A	Bidder To Furnish	
27.	Guaranteed Efficiency i) At 75 ºc ii) At Unity P.F iii) At Full Load		Bidder To Furnish	
28.	Regulation: At Full Load, 0.8 P.F At 75^0c Winding Temperature	%	Bidder To Furnish	
29.	Core:			
a)	Material of Core Lamination		CRGO/ MOH	
b)	Insulation of Core Lamination		Bidder To Furnish	
30.	Winding			
a)	Class of Insulation		Bidder To Furnish	
b)	Material		Copper	
31.	Tapping			
a)	Tapping On Winding	HV/LV	HV	

b)	Whether On Load / Off-Circuit		OLTC / OCTC	
c)	Tapping Range	%	Shall be as per IS 1180 -2014	
d)	Tapping Step	%	Shall be as per IS 1180 -2014	
32.	Parallel Operation		No	
33.	Terminal Bushings		HV / LV	
a)	Rated Voltage Class –	KV	11/ 0.433 (To be confirmed with MGVCL/GEB)	
b)	Rated Current Class –	A	Bidder To Specify	
c)	Impulse(1.2/ 50 μ Sec. Wave Withstand) –	kVp	75	For 11kV
d)	One Minute Power Frequency Withstand (Dry & Wet)	kV (Rms)	28	For 11kV
e)	Minimum Clearance In Air (Ph-Ph/Ph-Gnd)	mm/ kV	25	
f)	Minimum Creepage Distance (Total)	mm	Bidder To Furnish	
g)	Protected Creepage Distance	mm	Bidder To Furnish	
h)	Voltage Tap For Use With Potential Device	Reqd./ Not Reqd.	Bidder To Furnish	
34.	Bushing CT, If Required	Reqd./ Not Reqd.	Not Required	
a)	BCT Core No.			
b)	CT Ratio			
c)	Class			
d)	VA Burden	VA		
e)	Knee Point Voltage (vk)	V		

f)	Magnetizing Current (Ie.) mA at (vk /2)	V		
g)	Secondary Resistance (Rct)	Ohms		
35.	Terminal Connections Rigid Bus/ ACSR Conductor / Air Insulated Cable Box With Disconnecting Chamber/ Bus Duct		As Per System Requirement	
36.	All The Accessories, Protections, Equipments - Compliance With Specification, SLD & Data Sheet Requirements.		Yes/ No	
37.	No Of Units To Be Subjected To Acceptance Tests		Each Unit	

3.0 LT METAL ENCLOSED SWITCHGEARS

Sr. No	Description	Unit	Particulars	To be filled By Bidder
1	Make		As per approved list	
2	Applicable Standards		As per Tender Specification	
3	Overall dimensions of 415V Metal Enclosed Switchgear panel (Length x Depth x Height)	mm	Bidder to Furnish	
4	Quantity	Nos	As per Specification Requirement & approved SLD.	
5	415 V Switchgear and Bus bar Ratings			
a)	Rated voltage phase and frequency		415 V, 3 Ph 50 Hz	
b)	Type of Construction ACB- EDO MCCB – Fixed Type		Metal Enclosed, modular Type Front operated Draw out / Fixed type, construction as per Form 4 of IS 8623/ IEC 60439	

Sr. No	Description	Unit	Particulars	To be filled By Bidder
c)	Maximum system voltage	V	415 +10%	
d)	One minute power frequency voltage			
	i) Power circuits	V	2500	
	ii) Control circuits	V	1500	
	iii) Aux. Circuits connected to Sec of CTS	V	1500	
e)	i) Continuous current rating of Bus bars under site reference Ambient Temperature and type ii) Bus Bar Material	A	Minimum as per approved SLD & specification Aluminum(Al)	
f)	Bus bar insulation		Fully insulated encapsulation by heat shrinkable coloured PVC sleeves and tapes.	
g)	Reference Ambient Temperature	^{o} C	50° C	
h)	Maximum Temperature of Bus bars, Droppers and Contacts at Continuous current rating under site ambient temperature	^{o} C	85° C for non silver plated joints 105° C silver plated joints	
i)	Short Circuit current withstand for Busbars and droppers (i) Short time 1 sec	kA (rms)	Bidder to Furnish based on Design requirements	
6	Switchgear Constructional Requirements			
a)	Type of Construction		Single front type as per Form 4 of IS 8623 / IEC 60439	
b)	Thickness of sheet steel (i) Frame, Frame enclosures, doors, covers and partitions	mm	CRCA Sheet – 2.0 Partition – 1.6 Load bearing Members -2.5 mm Gland Plate – 3 mm	
c)	Degree of protection		IP 52 for Indoor IP 55 for Outdoor	
d)	Color finish shade		Interior : Glossy white	
			Exterior : Light grey semi glossy Shade 631 of IS-5	

Sr. No	Description	Unit	Particulars	To be filled By Bidder
e)	Earthing Bus - Material - Size		Al suitable for Max.SC rating for 1 sec)	
f)	Earthing conductor (Main grid) - Material - Size		GI suitable for Max.SC rating for 1 sec)	
g)	Minimum clearances in air of live parts (i) Phase to Phase (ii) Phase to Earth	 mm mm	As per IS std. & to suite BIL 25 mm 20 mm	
h)	Cable entry to cubicles		Bottom	
7	Instrumentation Transformers			
a)	Current transformer			
i)	Make		As per approved make list	
ii)	Ratio		…/ 5A - As per Requirements	
iii)	Burden	VA	15 Minimum	
iv)	Accuracy Class (Metering)		1.0	
v)	Accuracy Class (Protection)		5P20	
b)	Voltage transformer			
i)	Make		As per approved list	
ii)	Ratio		415/√3 / 110 √3 - As per Requirements	
iii)	Burden	VA	50 VA Minimum	
iv)	Accuracy Class (Metering)		1.0	
v)	Accuracy Class (Protection)		3P	
8	Switchgear, Starters & Other Components		Minimum requirements as per approved SLD, Design Criteria & Specification requirements (Yes / No)	

4.0 LT APFC PANEL

Sr. No	Description		Unit	Particulars	To be filled By Bidder
1	Capacitor Bank Panel Particulars				
a)	Make			As per approved make list	
b)	Applicable Standards			As per Tender Specification	
c)	Quantity			2 Nos.	
d)	Rated Capacity		KVAR	* Bidder to furnish as per design requirement.	
e)	Capacitor losses (i) For complete bank (ii) For individual units		 Watts Watts	 0.5W/ kVAr 0.2W/ kVAr	
f)	Rated voltage		V	415	
g)	Rated frequency and phases			50 Hz, 3 Phase	
h)	Ambient temperature		^{o} C	50	
i)	Cable gland required			Yes	
j)	Size of cable			As per design Requirements	
k)	Cable entry			Bottom	
2	Unit Capacitors				
a)	Rated voltage		V	415V	
b)	Standard Rated Output per bank at 415V		KVAR	5 / 10 /15 / 25 / 50 / 100 KVAr	
c)	Maximum over voltage the unit capacitor is capable of withstanding continuously		%	As per IS 13585	
d)	Type			Double Layer APP	
3	Constructional Requirement				
a)	Overall dimensions of Capacitor control panel (Length x Depth x Height)		mm	Pl. Furnish	
b)	Thickness of sheet steel i) Frame, Frame enclosures, doors covers and partition		mm	CRCA - 2.0 Partition-1.6 Gland plate -3	
c)	Degree of protection			IP 4X	
d)	Color finish shade			Interior : Glossy white	
				Exterior : Light Grey Semi Glossy, Shade 631 of IS:5	
e)	Earthing bus	Material		GI	
		Size	mm x mm	* Bidder to furnish as per design requirement.	

Sr. No	Description		Unit	Particulars	To be filled By Bidder
f)	Earthing conductor	Material		GI	
		Size	mm x mm	* Bidder to furnish as per design requirement.	
4	Design Requirements				
a)	Insulation level		kV (rms)	2.5	
b)	Capacitor bank connection			Delta	
c)	Short circuit withstand for busbars Short time (1 sec)		kA (rms)	*	
d)	Type of switching			Automatic switching responsive to power factor through power factor sensing relay	
e)	Switching steps		Min. 8	As Per Requirements	
f)	Rating of contactor			AC 6b Duty - To suit KVAR unit	
g)	Incomer switch current rating		150% of rated	* As Per Requirements	
h)	Busbars			Al	

5.0 POWER, CONTROL & INSTRUMENTATION CABLES

Sr. No.	Description	Unit	Particulars	To be filled By Bidder
1	11 kV (E), multi strand, Al, XLPE insulated, inner & outer extruded PVC sheathed, GI armoured power cable (as required)	LS	As per IS 7098 Part -II	
a)	Make		As per approved	
b)	Applicable Standards		As per Tender Specification	
2	1.1 kV, multi strand Cu/ Al, XLPE insulated, inner & outer extruded PVC sheathed, GI armoured power/submersible cable (Cu conductor cable & GI round wire armoring for sizes upto 6 sq mm & below, for balance all, above 6 sq. mm conductor size- Al	LS	As per IS 7098- Part -I	

Sr. No.	Description	Unit	Particulars	To be filled By Bidder
	conductor & GI flat strip armouring) (Cu conductor, double PVC sheathed, water tight, flexible cable for submersible pump application)			
a)	Make		As per approved list	
b)	Applicable Standards		As per Tender Specification	
3	1.1 kV, multi-strand Cu, XLPE insulated, inner & outer extruded PVC sheathed, GI armoured control cables	LS	As per IS 7098	
a)	Make		As per approved list	
b)	Applicable Standards		As per Tender Specification	
c)	GENERAL			
	Type of Cable Gland (Suitable for Cable Size as per requirement)		Double compression brass type	
	Type of Cable Lugs (Suitable for Cable Size & material or bimetallic - as per requirement)		Crimping type	
	All Cable accessories as per specification requirements to be provided.		Yes/No	

6.0 EARTHING AND LIGHTNING PROTECTION SYSTEM

Sr. No	Description	Unit	Particulars	To be filled By Bidder
1	Main Earthing Grid		To Suite as per Maximum SC Rating & Design Criteria	
2	Conductor Leads To Equipment		(Minimum 2 distinct earthing leads for equip. having > 125V & 1 earthing lead for equip. with<125V)	
3	Other Items			
(a)	Main lighting D.B, Control panels and sub-lighting distribution boards	Mtr.	GI, 25x6mm	
(b)	Hand Rails	Mtr.	GI, 25x3	

Sr. No		Description	Unit	Particulars	To be filled By Bidder
	(c)	Cable trays	Mtr.	GI, 25x3	
	(d)	Tanks	Mtr.	GI, 25x3	
	(e)	Junction boxes	Mtr.	GI wire, 8 SWG	
	(f)	Lighting fixtures, single phase receptacles, lighting conduits,	Mtr.	GI wire, 12 SWG	
	(g)	Push button stations, limit switches,	Mtr.	GI wire, 12 SWG	
	(h)	Crane rail,	Mtr.	GI, 25x3 mm	
	(i)	Street lighting, flood lighting poles and junctions boxes,	Mtr.	GI, 25x3mm	
	(j)	Metallic noncurrent carrying structures,	Mtr.	GI, 25x3 mm	
4		Lightning Conductors	Mtr.		
	(a)	Lightning protection down comers for building,	Mtr.	GI, 25x6 mm	
	(b)	Lightning protection horizontal roof conductor for building	Mtr.	GI, 25x6 mm	
5		Electrodes			
	(a)	Pipe electrode	Nos.	-Heavy duty GI pipe 4500 mm long, 40NB (Quantity to achieve ≤ 1 Ohm earth resistance based on 50 ohm-m or higher resistivity on the basis of actual measurement whichever is higher) - Minimum 4 Nos. of 600mm x 600mm x 3.15 mm for each transformer -Minimum 2 Nos. 300mm x 300mm x 3.5 mm for each 11 kV DP Structure	
	(b)	Plate Electrode			
6		Earthing Resistance to be achieved	Ohm	1	

7.0 LIGHTING & RECEPTACLE SYSTEM AND EQUIPMENT

Sr. No.		Description	Unit	Particulars	To be filled By Bidder
1		System Particular			
	(a)	Voltage			
		(i) 3 Phase, 4 wire 50 Hz system			
		• Rated	V	415	
		• Maximum	V	476	
		(ii) D.C. system			
		• Rated	V	110	
	(b)	One minute withstand voltage		2000 V AC.	
	(c)	System short-circuit level			
		(i) At 415 V, A.C.	kA (rms)	10	
		(ii) At 110 V.D.C.	kA (D.C.)	6	
	(d)	Reference ambient temperature		45^0 C	
2		Distribution Board/Panels			
	(a)	Make		As per approved list	
	(b)	Applicable Standards		As per Tender Specification	
	(c)	Main, floor mounted distribution boards			
		(i) Main LDB (A.C.)		As per requirement	
		• Bus bars		Al	
		• Bus bar current rating	A	As per requirement	
		• Incoming		As per requirement	
		• Outgoing		As per requirement (With Minimum 2 spare feeders)	
		• Cable entry		Bottom	
		• Location		Indoor	
		• Earthing terminals		50x8 mm GI flat	
		(ii) Emergency lighting panel		As per requirement	
		• Bus bar		Copper	
		• Bus bar current rating	A	As per Requirement	
		• Incoming and outgoing feeders		As per requirements (With Minimum 2 spare feeders)	
		• Cable entry		Bottom	

Sr. No.		Description	Unit	Particulars	To be filled By Bidder
		• Location		Indoor	
		• Earthing terminals		50x6 mm GI flat	
	(d)	Sub DBs, wall/structure mounting panels			
	i)	SLDB for indoor area		As per requirement	
		• Bus bars		Copper	
		• Bus bar current rating	A	As per requirement	
		• Incoming and outgoing feeders		1 No. Incoming TPN MCB * (Minimum32A) with ELCB As per requirement Outgoing 10/16A MCB SPN and DP ELCB per phase with PPI (With Minimum 2 spare feeder circuits; a single circuit consists of SPN MCBs for R,Y, B phase)	
		• Cable entry		Bottom/Top	
		• Location		Indoor	
	ii)	SLDB for outdoor area		As per requirement	
		• Bus bars		Copper	
		• Bus bar current rating	A	As per requirement	
		• Incoming		1No.-Incoming * A TPN MCB (Minimum32A) with ELCB- with timer (0-24 hours)	
		• Outgoing		As per requirement Outgoing 10/16 A SPN MCB with switch contactors. (With Minimum 2 spare feeder circuits; a single circuit consists of SPN MCBs for R,Y, B phase)	

Sr. No.		Description	Unit	Particulars	To be filled By Bidder
		• Cable entry		Bottom/Top	
		• Location		Indoor	
	(e)	Paint Finish			
	i)	Color shade		Interior : Glossy white	
				Exterior : Light gray semi glossy Shade 631 of I.S:5	
	ii)	Epoxy paint required		Yes.	
	(f)	Earthing terminals suitable for conductor			
	i)	Size	mm x mm	25x3 flat	
	ii)	Material		G.I.	
3		Receptacle Units			
	(a)	Make			
	(b)	Decorative (complete with flush/surface mounted boxes/cover plates etc.)			
	i)	3 pin 1-ph & N with switch and plug tops	A	5/15 A, Indoor Type	
	(c)	Industrial (complete with surface mounted, pre fabricated CRCA boxes)			
	i)	3 Pin, 230V AC		As per required	
		With ELCB(30mA) & plug	A	15A, Indoor Type	
	ii)	5 pin, 3 Ph, 415V With ELCB(30mA) & plug With ELCB(30mA) & plug	 A A	As per required 63A, Outdoor type 32A, Indoor type	
4		Lighting Wires			
	(a)	Make 1100V, PVC insulated:		As per approved list	
	(b)	Conductor		Stranded Copper	
	(c)	Size (Sizes mentioned are minimum & size to be decided on circuit load & voltage drop criteria)	Core x mm^2	Lighting 2x1Cx1.5 mm^2 Receptacle / Sockets Decorative 2x1Cx1.5mm^2 Industrial 1ph - 2x1Cx4 mm^2 3ph – 4Cx 6 /16 mm^2	
5		Conduits			
	(a)	Make			
	(b)	Material		Galvanized steel	
	(c)	Size	mm	20	

Sr. No.		Description	Unit	Particulars	To be filled By Bidder
6		Street Light Poles And Flood Light Poles			
	(a)	Make		As per Approved list	
	(b)	Street Light Pole			
	i)	Enclosed dwg. No.:		Ref. Typical Drawing attached with Specs.	
	ii)	Total Height:	m	8.5/10/12	
	iii)	Quantity:	Nos.	As per requirement	
	(c)	Junction Box with Pole			
	i)	Enclosed dwg. No.:		Pl. furnish.	
	ii)	No. of cable entries:	Nos.	Two	
	iii)	Cable entry suitable for :		4C-10/16 mm^2 Al. Conductor, PVC insulated, armoured cable	
	iv)	Earthing terminal suitable for		25x3 mm GS Flat	
	(d)	Floodlight Light Pole			
	i)	Total height	Mtr.	8.5/10/12/High Mast	
	ii)	No. of floodlights to be fixed per pole	No.	Minimum One/as required	
	iii)	Painted		Yes	
	iv)	Earthing terminal suitable for	mm x mm	25x3	
	v)	Quantity :	Nos.	As per requirement	
7		Luminaire (Lighting fixture complete with prewired control gear terminal block & suitable lamps)	LS	As per specification requirement	
8		Note			
		Supply of conduits, wires/cables, all fixing hardware, terminal connectors, cable termination kits and associated accessories for -lighting, receptacles, earthing, cabling & wiring works, required Civil works etc. shall be included in Contractor's scope. All ELCBs for lighting circuit shall be with 100mA sensitivity. All ELCBs for receptacle circuit shall be with 30mA sensitivity.			

8.0 EQUIPMENTS / INSTRUMENTS DETAILS (As Applicable)

Sr. No.	Description	To Be Filled By Bidder
	Location	

1.	Relay	Make & Model No.		Yes/ No	
1.1	Instantaneous Over Current & Earth Fault Protections (50 & 50N) (Element Of Numerical Relay)				
1.2	IDMT Over Current & Earth Fault Protections (51 & 51N) (Element Of Numerical Relay)				
1.3	Master Trip / Lock Out Relay (86) (Separate Relay)				
1.4	Stand By Earth Fault Relay (51ns) (Separate Relay)				
1.5	Under Voltage/ No Voltage (27) & Over Voltage Relay (59)				
1.6	Trip Circuit Supervision Relay (95)				
1.7	Auxiliary Relay (Separate Relays Based On Requirements, With At Least One Spare Element)				
1.8	Automatic Voltage Regulator (Separate Device)				
1.9	Microprocessor Based Battery Charger Controller				
1.10	Motor Protection Relay (98) (Comprehensive Motor Protection Relay For Motor Ratings Above 132kw)				
2.	Switchgear	Application	Make & Model No.	Rating / Release Type	Yes / No
2.1	MCCB	Above	As Per Approved Make	Minimum As	

		630A	List	Per BOQ & Specification Requirements		
2.2	MCB	Up to 630 A	As Per Approved Make List			
2.3	Fuse		As Per Approved Make List			
3.	Starters (Including All Components For Type-2 Co-Ordination)	Application (Provide Feeder Range For Which It Is Applicable)	Make	Type -2 Co-Ordination (With MCCB) Ensured – Yes/No		Yes
3.1	D.O.L.	Up to 5.5 kW	As Per Approved Make List	Yes		
3.2	Star-Delta	For 5.5 kW To 15 kW		Yes		
3.3	Auto Transformer Starter (ATS)	For 15 kW and Above		--		
4.	Meters	Application	Make & Model No.	Type	Size	
4.1	Ammeter	Minimum As Per approved SLD & Specification Requirements	As Per Approved Make List			
4.2	Voltmeter					
4.3	MFM		As Per Approved Make List			
4.4	TVM /Tariff Meter (As Per MGVCL/GEB Requirements)	(As Per MGVCL/GEB Requirements)				
5.	Annunciators	Quantity	Make & Model No.	Indication Lamp Type		
5.1	8 Window					
5.2	16 Window					
6.	Whether Detailed Literature For All The Above (Item 1					

	To 5) Items Enclosed With Tender (Yes / No)	

Signature of Contractor Executive Engineer