PART – C

TECHNICAL SCHEDULES

PART – C : SCHEDULES

SECTION – C1

TECHNICAL SCHEDULES - MECHANICAL

PART – C

SECTION – C1

TECHNICAL SCHEDULE - MECHANICAL

I FIRE FIGHTING SYSTEM

1.0 Technical Data by the Bidder

Description	Unit	Data
Fire water main pump and Terrace pump, electrical driven		
Description	-	
Number off	-	
Type	-	
Manufacturer	-	
Pumped fluid	-	
Temperature	°C	
Duty capacity, worst case scenario	gpm	
Minimum continuous flow	gpm	
Total head	Bar (g)	
Total head at close valve	Bar (g)	
Absorbed power	kW	
Efficiency at duty point (percent)		
Tolerance on above point (+)%		
Power required at coupling at duty point	kW	
Power required at 150% discharge	kW	
Power required at shut-off	kW	
Rotation viewed from driven end		
Rated speed	RPM	
Specific speed (Metric Units)		
Critical speed above rated speed Expressed as minimum % percentage		

Description	Unit	Data
Pump performance curve reference		
Number of stages		
Water temperature for operating range without cavitation	°C	
NPSH required		
Size of pump suction	mm	
Size of pump discharge	mm	
Impeller tip velocity (metres per second)		
Impeller head/stage	M	
Main bearing type & material		
Number of bearings		
Type thrust bearing		
Pump axial thrust		
Means of adjusting axial clearance		
Thrust bearing lubrication type		
Max. pressure for jacket cooling water (kg/cm^2) and flow rate (LPM)		
Type of lubrication of intermediate bearing		
Type of stuffing box/cooling water required for glands LPM		
Type of coupling between pump and drive		
Is the shaft provided with renewable Sleeves?		
Pump weight	kg	
Pump & motor weight	kg	
Guaranteed vibration noise		
Guaranteed vibration limits		
Axial thrust on foundation	kgs	
Radial thrust on foundation	kgs	
Dynamic load	kgs	
Are pump and motor characteristics suitable for proportionate division and parallel operation over the entire range?		

Description	Unit	Data
Material of Construction		
Pump casing		
Impeller		
Shaft		
Shaft packing		
Coupling		
Discharge flange		
Base plate		
Casing wearing ring		
Impeller wearing ring		
Gasket		
Column pipe		
Bolt & nut		
Fire main pump motor		
Number off	-	
Type	-	
Manufacturer	-	
Type designation	-	
Enclosure classification (IP No)	-	
Class of insulation	-	
Rated power	kW	
Fire water jockey Pump, electrical driven		
Description	-	
Number off	-	
Type	-	
Manufacturer	-	
Pumped fluid	-	

Description	Unit	Data
Temperature	°C	
Duty capacity, worst case scenario	gpm	
Minimum continuous flow	gpm	
Total head	Bar(g)	
Total head at close valve	Bar(g)	
Absorbed power	kW	
Efficiency at duty point (percent)		
Tolerance on above point (+)%		
Power required at coupling at duty point	kW	
Power required at 150% discharge	kW	
Power required at shut-off	kW	
Rotation viewed from driven end		
Rated speed	RPM	
Specific speed (Metric Units)		
Critical speed above rated speed Expressed as minimum percentage		
Pump performance curve reference		
Number of stages		
Water temperature for operating range without cavitation	°C	
NPSH required		
Size of pump suction	mm	
Size of pump discharge	mm	
Impeller tip velocity (metres per second)		
Impeller head/stage	M	
Main bearing type & material		
Number of bearings		
Type thrust bearing		
Pump axial thrust		
Means of adjusting axial clearance		

Description	Unit	Data
Thrust bearing lubrication type		
Max. pressure for jacket cooling water (kg/cm²) and flow rate (LPM)		
Type of lubrication of intermediate bearing		
Type of stuffing box/cooling water required for glands LPM		
Type of coupling between pump and drive		
Is the shaft provided with renewable Sleeves?		
Pump weight	kg	
Pump & motor weight	kg	
Guaranteed vibration noise		
Guaranteed vibration limits		
Axial thrust on foundation	kgs	
Radial thrust on foundation	kgs	
Dynamic load	kgs	
Are pump and motor characteristics suitable for proportionate division and parallel operation over the entire range?		
Material of Construction		
Pump casing		
Impeller		
Shaft		
Shaft packing		
Coupling		
Discharge flange		
Base plate		
Casing wearing ring		
Impeller wearing ring		
Gasket		
Column pipe		
Bolt & nut		

Description	Unit	Data
Fire jockey pump motor		
Number off	-	
Type	-	
Manufacturer	-	
Type designation	-	
Enclosure classification (IP No)	-	
Class of insulation	-	
Rated power	kW	
Fire main pump (with diesel engine driven)		
Description	-	
Number off	-	
Type	-	
Manufacturer	-	
Pumped fluid	-	
Temperature	°C	
Duty capacity, worst case scenario	gpm	
Minimum continuous flow	gpm	
Total head	Bar (g)	
Total head at close valve	Bar (g)	
Absorbed power	KW	
Efficiency at duty point (percent)		
Tolerance on above point (+)%		
Power required at coupling at duty point	kW	
Power required at 150% discharge	kW	
Power required at shut-off	kW	
Rotation viewed from driven end		
Rated speed	RPM	

Description	Unit	Data
Specific speed (Metric Units)		
Critical speed above rated speed Expressed as minimum percentage		
Pump performance curve reference		
Number of stages		
Water temperature for operating range without cavitation (*C)		
NPSH required		
Size of pump suction	mm	
Size of pump discharge	mm	
Impeller tip velocity (metres per second)		
Impeller head/stage	M	
Main bearing type & material		
Number of bearings		
Type thrust bearing		
Pump axial thrust		
Means of adjusting axial clearance		
Thrust bearing lubrication type		
Max. pressure for jacket cooling water (kg/cm²) and flowrate (LPM)		
Type of lubrication of intermediate bearing		
Type of stuffing box/cooling water required for glands LPM		
Type of coupling between pump and drive		
Is the shaft provided with renewable Sleeves?		
Pump weight	kg	
Pump & motor weight	kg	
Guaranteed vibration noise		
Guaranteed vibration limits		
Axial thrust on foundation	kgs	
Radial thrust on foundation	kgs	
Dynamic load	kgs	

Description	Unit	Data
Are pump and motor characteristics suitable for proportionate division and parallel operation over the entire range?		
Material of Construction		
Pump casing		
Impeller		
Shaft		
Shaft packing		
Coupling		
Discharge flange		
Base plate		
Casing wearing ring		
Impeller wearing ring		
Gasket		
Column pipe		
Bolt & nut		
Diesel engine for fire main pump		
Description	-	
Number	-	
Type	-	
Manufacturer	-	
Type designation	-	
Frame size	-	
Rated capacity (ISO)	kW	
Rate power (at site Temperature)	kW	
Fuel consumption (at site rating)	l/s	
Fuel tank capacity	m^3	
Engine horse power at duty point (BHP)		
Engine Detail		

Description	Unit	Data
Number of cylinders		
Number of strokes		
Rated RPM and BHP		
Efficiency %		
BHP at standard condition		
BHP at site condition (Derated power)		
BHP at 150% of the flow rate		
Is engine turbo charged or naturally aspirated?		
Fuel consumption at rated flow rate and head		
Fuel consumption at 150% of the flow rate		
Is engine cooling arrangement provided with accessories?		
Type of engine cooling arrangement		
Is auto-speed governing arrangement provided with accessories?		
Is auto-starting of engine provided?		
Type of lubrication		
Is fuel oil storage tank provided complete with accessories (give capacity of the tank and list all the accessories)		
Is the diesel engine and pump provided on a common base plate?		
Total weight of the diesel engine - kg		
List accessories provided on the diesel engine		
Reference to the technical leaflet of the diesel engine		
Diesel oil consumption		
Trickle and boost charge provided		
List of engine controls		
Expansion Tank		
Expansion tank capacity	m^3	
Type of pressure rising (describe)	-	
Corrosion protection	-	

Description	Unit	Data
Valves and Specialties		
Gate Valves		
Manufacturer		
Type		
Sizes		
Rating		
End connection		
Code / Standard		
Material of construction		
Body		
Bonnet		
Stem		
Wedge disc		
Body seat ring		
Back sheet		
Stem packing		
Hand wheel		
Bonnet bolts & nuts		
Bonnet gasket		
Valve box		
Testing		
Test pressure		
Painting		
Approval		
Non return valves		

Description	Unit	Data
Manufacturer		
Type		
Total number of each size furnished		
Material of construction		
Body		
Hinges		
Hinge pin/ suspension pin		
Bolts		
Nuts		
Bearing bushes		
Flange drilling particulars		
Reference to manufacturer’s standard		
Strainers		
Manufacturer		
Type		
Sizes offered		
Total number of each size furnished		
Material of construction		
Body		
Filter element		
Flange drilling particulars		
Blowdown arrangement provided		
Filter mesh size		
Reference to the manufacturer's drawings		
Maximum pressure drop at clean / 50% chocked condition		
Fire Hose		

Description	Unit	Data
Type		
Size		
Code / standard		
Length		
End fittings		
Testing		
Approval		
Catalogue		
Hose Cabinet		
Type		
Size		
Mounting		
Features		
Fastening nuts, bolts and hardware		
Painting		
GA drg.		
Portable Extinguishers		
Gas Expelled Water Type Extinguisher		
Type		
Design standard		
Quantity		
Guaranteed performance		
Capacity	L	
Max. Effective range when tested in still air	M	
Min. period during which the continuous jet shall be maintained	Sec.	
Maximum period for discharge of 95% of the charge	Sec.	
Constructional features		

Description	Unit	Data
Body		
Dome and dish		
Method of operation		
Filling ratio		
Test pressure for cylinder valve		
Test pressure for discharge hose		
Storage pressure		
Type of safety release		
Material of construction		
Physical data		
Accessories		
Chemical		
Mounting brackets complete with all hardware		
Discharge nozzle with flexible hose		
Carrying handle		
Any other as per design code		
Approvals		
Painting and testing		
Carbon Di Oxide (CO_2) type Portable Extinguisher		
Type		
Design standard		
Quantity		
Guaranteed performance		
Capacity	Kg	
Maximum effective range when tested in still air	M	
Min. period during which the continuous jet shall be maintained.	Sec.	
Maximum period for discharge of 95% of the charge	Sec.	

Description	Unit	Data
Constructional features		
Material of construction		
Physical data		
Accessories		
Chemical charge		
Distribution horn with flexible hose		
Mounting brackets complete with all hardware		
Carrying handle		
Any other as per design code		
Approvals		
Painting and testing		
Dry Chemical Powder (DCP) type Portable Extinguisher		
Type		
Design standard		
Quantity		
Guaranteed performance		
Capacity	Kg	
Max. effective range when tested in still air	M	
Min. period during which the continuous jet shall be maintained	Sec	
Maximum period for discharge of 95% of the charge	Sec	
Constructional features		
Material of construction		
Physical data		
Accessories		
Chemical charge		
Piston grip nozzle with discharge hose		
Mounting brackets complete with all hardware		

Description	Unit	Data
Carrying handle		
Any other as per design code		
Approvals		
Painting		
Foam Type Portable Extinguisher		
Type		
Design standard		
Quantity		
Guaranteed performance		
Capacity	lts	
Max. effective range when tested in still air	m	
Min. period during which the continuous jet shall be maintained	sec	
Maximum period for discharge of 95% of the charge	sec	
Constructional features		
Material of construction		
Physical data		
Accessories		
Chemical charge		
Mounting brackets complete with all hardware		
Carrying handle		
Pressure indication		
Discharge nozzle with flexible hose		
Any other as per design code		
Approvals		
Painting and testing		
Fire Hydrants		

Description	Unit	Data
Type	-	
Number off	-	
Manufacturer	-	
Model/type No.	-	
Number of outlets	-	
Flow capacity each outlet	l/s	
Type/size of coupling	mm	
Materials	-	
Hose Reels		
Type	-	
Number	-	
Manufacturer	-	
Hose diameter	mm	
Hose length	M	
Nozzle:		
Type	-	
Material	-	
Cabinet (if applicable)	-	
Size (Width x height x depth)	mm	
Material	-	
Fire Alarm and detection system		
Manufacturer	-	
Type	-	
Fire alarm central station		
Number of cubicles	-	
Dimension per cubicle		

Description	Unit	Data
Weight of one cubicle	Kg	
Power requirements	VA	
Main supply voltage	V	
Operating voltage of fire alarm lines	V	
Maximum number of alarm lines possible	-	
Fault detection system for wire breakage	Yes/no	

SIGNATURE OF BIDDER _____

NAME _____

DESIGNATION _____

COMPANY SEAL

DATE _____

2.0 Guarantees by the Bidder

The performance parameters that are to be guaranteed by the bidder are to be furnished in the Schedule of Guaranteed Data given below and the values provided therein shall be binding on the bidder. The tolerance for acceptance shall be as per applicable codes and/or as mutually agreed. Bidder shall indicate the tolerance for the guaranteed data. Exceeding the specified guaranteed noise level is not acceptable. The vibration limits shall comply to the 'satisfactory' levels as stipulated in the technical specification.

When the pumps are running, the maximum acceptable noise level shall not exceed 85 dB (A) at 1 m distance.

The equipment shall be guaranteed to meet performance requirements required by this specification. Any rectification work required to meet the performance requirements shall be carried out until satisfactory results are obtained. All work related to correction and subsequent performance testing to prove stability/reliability shall be carried out with no extra cost to the Client.

The Client reserves the right to reject the equipment should the performance values fall short of those indicated in the Schedule of Guaranteed Data. In case the Client rejects the equipment, the Contractor shall replace the equipment with a new one and achieve the performance as guaranteed. The replacement shall be done within a reasonable period of time as indicated by the Client and with no extra cost to the Client.

Description	Unit	Data
Main Fire Pumps (Electrically driven)		
a) Head	Bar (g)	
b) Flow	gpm	
c) Quantity	Nos	
d) Drive rating	kW	
e) Guaranteed Power Consumption	kW	
f) Noise level at 1.0 m away from the equipment	dBA	≤ 85
g) Vibration		
Standby Fire Pumps (Diesel Engine driven)		
a) Head	Bar (g)	
b) Flow	gpm	
c) Quantity	Nos	
d) Drive rating	bhp	

Description	Unit	Data
e) Noise level at 1.0 m away from the equipment	dBA	≤ 85
f) Vibration		
Pressure Maintenance Pump (Jockey pumps)		
a) Head	Bar (g)	
b) Flow	gpm	
c) Quantity	Nos	
d) Drive rating	kW	
e) Guaranteed Power Consumption	kW	
f) Noise level at 1.0 m away from the equipment	dBA	≤ 85
g) Vibration		
Hydrant System		
Pressure at hydraulically remotest point	Bar(g)	

SIGNATURE OF BIDDER _____

NAME _____

DESIGNATION _____

COMPANY SEAL

DATE _____

II ELEVATORS (FOR EACH CAPACITY)

1.0 Technical Data by the Bidder

S.No.	Description	Unit	Data
1.0	General		
a)	Manufacturer		
b)	Place of manufacture		
c)	Applicable standard		
d)	Type of elevator		
e)	Capacity	Kg	
f)	Quantity	Nos.	
g)	Speed of elevator	M/Min	
h)	Number of floors served		
i)	Travel	Metres	
j)	Lift well size		
k)	Pit depth		
l)	Minimum over head		
m)	Machine room size (LXWXH)		
n)	Height of machine room		
2.0	Elevator Car		
a)	Dimensions (internal)		
b)	Dimensions (external)		
c)	Finish(inside)	-	
d)	Platform size		
e)	Door opening size		
3.0	Hoist Motor		
a)	Make		
b)	Rating	kW	
4.0	VVVF drive for Hoist motor		
a)	Make		

b)	Rating		
c)	Model no.		
5.0	VVVF drive for door motor		
a)	Make		
b)	Rating		
c)	Model no.		
6.0	Controller panel		
a)	Make		
b)	Type		
c)	Enclosure protection		
d)	Thickness of sheet steel	mm	
e)	Overall dimensions		
f)	List of devices provided		

SIGNATURE OF BIDDER _____

NAME _____

DESIGNATION _____

COMPANY SEAL **DATE** _____

2.0 Guarantees by the Bidder

The performance parameters that are to be guaranteed by the bidder are to be furnished in the Schedule of Guaranteed Data given below and the values provided therein shall be binding on the bidder. The tolerance for acceptance shall be as per applicable codes and/or as mutually agreed.

The equipment shall be guaranteed to meet performance requirements required by this specification. Any rectification work required to meet the performance requirements shall be carried out until satisfactory results are obtained. All work related to correction and subsequent performance testing to prove stability/reliability shall be carried out with no extra cost to the Client.

The Client reserves the right to reject the equipment should the performance values fall short of those indicated in the Schedule of Guaranteed Data. In case the Client rejects the equipment, the Contractor shall replace the equipment with a new one and achieve the performance as guaranteed. The replacement shall be done within a reasonable period of time as indicated by the Client and with no extra cost to the Client.

Sl.No.	Description	Guaranteed Value
1	Minimum carrying capacity (Pay load) (kg)	
2	Speed (m/s)	
3	Power consumption (kw)	
4	Demonstration of performance of Auto rescue device	

SIGNATURE OF BIDDER _____

NAME _____

DESIGNATION _____

COMPANY SEAL

DATE _____

PART – C : SCHEDULES

SECTION – C2

TECHNICAL SCHEDULES - ELECTRICAL

PART – C

SECTION – C2

1.0 TECHNICAL SCHEDULES - ELECTRICAL

S.No.	Description	Unit	Data
1.0	**System design**		
1)	Total power requirement		
2)	No.of distribution substations envisaged		
3)	Rating of Distribution substation		
4)	Whether Single line diagram for substation attached?		
5)	Capacity of essential power		
6)	No.of DG sets and its rating		
2.0	**11 kV SWITCHGEAR**		
	A) Switchgear Assembly		
1)	Make		
2)	Type		
3)	Reference Standard		
4)	Voltage (Nom. / Max.)	kV	
5)	**Short Circuit Rating**		
	a. Interrupting MVA (sym.) for 1 sec	MVA	
	b. Short-time for 1 sec.	kA (rms)	
6)	**Insulation Level**		
	a. Impulse Withstand	kV (peak)	
	b. 1-min. 50 Hz. Voltage withstand	kV (rms)	
7)	Metal-clad construction?	Yes / No	
8)	Degree of Protection		
9)	Minimum thickness of sheet metal used	mm	
	B) Busbar		
10)	Make		

S.No.	Description	Unit	Data
11)	Material & Grade		
12)	Maximum temperature rise over 50°C	°C	
13)	Short time current for 1 sec.	kA (rms)	
14)	Minimum clearance of bare bus bar and connection		
	a. Phase to phase	mm	
	b. Phase to ground	mm	
15)	Bus bar provided with		
	a. Insulating sleeve		
	b. Phase barriers		
	c. Cast resin shrouds for joint		
	C) Circuit Breaker		
16)	Make		
17)	Type		
18)	Reference Standard		
19)	**Rated Current**		
	a. Continuous (at site condition, 50°C ambient & within cubicle)	Amp.	
	b. Short-time current for 1 sec.	kA (rms)	
20)	Maximum temperature rise over 50°C ambient	°C	
21)	Rated operating duty		
22)	**Operating Mechanism**		
	a. Type		
	b. No. of breaker operations stored		
	c. Trip free or fixed trip		
	d. Anti-pumping features provided		
	D) Current Transformer		
23)	Make		
24)	Type		
25)	Reference Standard		

S.No.	Description	Unit	Data
26)	Short Circuit Withstand		
	a. Short-time current for 1 sec.	kA (rms)	
	b. Dynamic current	kA (peak)	
27)	Class of Insulation		
28)	Temperature rise over 50°C ambient	°C	
	E) Voltage Transformer		
29)	Make		
30)	Type		
31)	Reference Standard		
32)	Accuracy Class		
33)	**Over Voltage Factor**		
	a. Continuous		
	b. 30 seconds		
34)	Class of Insulation		
35)	1 min. power frequency voltage withstand level	kV (rms)	
36)	Basic Impulse Level	kV (peak)	
	F) Relays		
37)	Make & type of relays		
38)	Reference Standard		
3.0	**RING MAIN UNITS**		
	A) Switchgear Assembly		
1)	Make		
2)	Type		
3)	Reference Standard		
4)	Voltage (Nom. / Max.)	kV	
5)	**Short Circuit Rating**		
	a. Interrupting MVA (sym.) for 1 sec	MVA	
	b. Short-time for 1 sec.	kA (rms)	

S.No.	Description	Unit	Data
6)	**Insulation Level**		
	a. Impulse Withstand	kV (peak)	
	b. 1-min. 50 Hz. Voltage withstand	kV (rms)	
7)	Metal-clad construction?	Yes / No	
8)	Degree of Protection		
9)	Minimum thickness of sheet metal used	mm	
	B) Busbar		
10)	Make		
11)	Material & Grade		
12)	Maximum temperature rise over 50°C	°C	
13)	Short time current for 1 sec.	kA (rms)	
	C) Circuit Breaker		
14)	Type		
15)	Reference Standard		
16)	**Rated Current**		
	a. Continuous (at site condition, 50°C ambient & within cubicle)	Amp.	
	b. Short-time current for 1 sec.	kA (rms)	
17)	Maximum temperature rise over 50°C ambient	°C	
18)	Rated operating duty		
19)	**Operating Mechanism**		
	a. Type		
	b. No. of breaker operations stored		
	c. Trip free or fixed trip		
	d. Anti-pumping features provided		
	D) Isolator		
20)	Type		
21)	Reference Standard		

S.No.	Description	Unit	Data
22)	**Rated Current**		
	a. Continuous (at site condition, 50°C ambient & within cubicle)	Amp.	
	b. Short-time current for 1 sec.	kA (rms)	
23)	Maximum temperature rise over 50°C ambient	°C	
24)	Type of Operating Mechanism		
	E) Current Transformer		
25)	Make		
26)	Type		
27)	Reference Standard		
28)	Short Circuit Withstand		
	a. Short-time current for 1 sec.	kA (rms)	
	b. Dynamic current	kA (peak)	
29)	Class of Insulation		
30)	Temperature rise over 50°C ambient	°C	
	F) Voltage Transformer		
31)	Make		
32)	Type		
33)	Reference Standard		
34)	Accuracy Class		
35)	**Over Voltage Factor**		
	a. Continuous		
	b. 30 seconds		
36)	Class of Insulation		
37)	1 min. power frequency voltage withstand level	kV (rms)	
38)	Basic Impulse Level	kV (peak)	
	G) Relays		
39)	Make & type of relays		
40)	Reference Standard		

S.No.	Description	Unit	Data
4.0	**DRY TYPE TRANSFORMERS**		
1)	Name & Place of Manufacturer		
2)	Type		
3)	Reference Standards		
4)	MVA rating		
5)	Rated no load voltage ratio (kV)		
6)	Connections		
	a. HV winding		
	b. LV windings		
7)	Vector group		
8)	Off load tap Changer		
	a. Type		
	b. Tap range		
	c. Tap step		
9)	Type of Cooling		
10)	Temperature rise over 50 deg C ambient .		
11)	Efficiencies at 75 Deg. C at 0.8 Power factor at full load		
12)	Component losses		
	a. No load loss at rated voltage on principal tapping & at rated frequency		
	b. Load loss at rated current at principal tapping at 75 Deg. C excluding auxiliary loss		
13)	Impedance voltage at rated current HV-LV (Nominal tap)		
14)	Rated HV current at rated voltage and rated frequency		
15)	Rated LV current at rated voltage and rated frequency		
16)	Short circuit withstand Duration		
17)	Type of Termination		
	a) HV		
	b) LV		
18)	Total Weight		

S.No.	Description	Unit	Data
19)	Overall dimensions		
	a) Length (mm)		
	b) Breath (mm)		
	c) Height (mm)		
5.0	**415V RISING MAINS**		
1)	Make		
2)	Type		
3)	Reference Standard		
4)	Shape & Size of Busduct		
5)	Voltage Class	V	
6)	Rated Voltage	V	
7)	Degree of protection		
8)	**Insulation Level**		
	a) 1 min power frequency withstand Voltage	kV rms	
9)	Rated Continuous Current at 50°Cambient temperature	Amps	
10)	**Maximum temperature rise over 50°C ambient**		
	a) Bus Conductor	Deg C	
	b) Bus Enclosure	Deg C	
	c) Bus joint-Plain / tinned	Deg C	
	d) Bus joint-Silver plated	Deg C	
11)	**Rated Short Time Current**		
	a) Symmetrical kA for 1 sec	kA	
	b) Momentary	kA Peak	
12)	**Material & Grade**		
	a) Conductor		
	b) Enclosure		
13)	**Conductivity** for Conductor		
14)	Conductor Shape		

S.No.	Description	Unit	Data
15)	Conductor Size	mm	
16)	Conductor weight / metre	kg	
17)	**Enclosure Data**		
	a) Phase Spacing	mm	
	b) Phase to phase clearance	mm	
	c) Phase to earth clearance	mm	
	d) Overall Dimensions	mm	
	e) Thickness of sheet steel	mm	
18)	**D.C.Resistance of conductor at**	μΩ/M/ph	
	a) 20°C		
	b) 90°C		
19)	**A.C.Resistance of conductor at**	μΩ/M/ph	
	a) 20°C		
	b) 90°C		
20)	50 Cycle Reactance in Ohm/meter/phase	Ω/M/ph	
21)	Weight per meter run	kg	
6.0	**415V BUS TRUNKING**		
1)	Make		
2)	Type		
3)	Reference Standard		
4)	Shape & Size of Busduct		
5)	Voltage Class	V	
6)	Rated Voltage	V	
7)	Degree of protection		
8)	**Insulation Level**		
	a) 1 min power frequency withstand Voltage	kV rms	
9)	Rated Continuous Current at 50°Cambient temperature	Amps	
10)	**Maximum temperature rise over 50°C ambient**		

S.No.	Description	Unit	Data
	a) Bus Conductor	Deg C	
	b) Bus Enclosure	Deg C	
	c) Bus joint-Plain / tinned	Deg C	
	d) Bus joint-Silver plated	Deg C	
11)	**Rated Short Time Current**		
	a) Symmetrical kA for 1 sec	kA	
	b) Momentary	kA Peak	
12)	**Material & Grade**		
	a) Conductor		
	b) Enclosure		
13)	**Conductivity** for Conductor		
14)	Conductor Shape		
15)	Conductor Size	mm	
16)	Conductor weight / metre	kg	
17)	**Enclosure Data**		
	a) Phase Spacing	mm	
	b) Phase to phase clearance	mm	
	c) Phase to earth clearance	mm	
	d) Overall Dimensions	mm	
	e) Thickness of sheet steel	mm	
18)	**D.C. Resistance of conductor at**	µΩ/M/ph	
	a) 20°C		
	b) 90°C		
19)	**A.C. Resistance of conductor at**	µΩ/M/ph	
	a) 20°C		
	b) 90°C		
20)	50 Cycle Reactance in Ohm/meter/phase	Ω/M/ph	
21)	Weight per meter run	kg	

S.No.	Description	Unit	Data
7.0	**415 V Power Control Centre**		
	A) Switchgear Assembly		
1)	Make		
2)	Reference standard(s)		
3)	Rated voltage & frequency	V & Hz	
4)	Short circuit rating		
	Short circuit withstand rating for 1 second	kA(rms)	
	Dynamic short circuit withstand rating	kA(peak)	
5)	One minute power frequency withstand voltage	kV(rms)	
6)	Degree of Protection		
7)	Type of steel		
8)	Sheet steel thickness for load bearing member	mm	
9)	Sheet steel thickness for enclosure & door	mm	
10)	Thickness for gland plate	mm	
11)	Construction		
12)	Overall dimension	mm x mm x mm	
	B) Bus Bar		
13)	Material & grade of main horizontal bus bar		
14)	Material & grade of Earth bus bar		
15)	Maximum temperature rise over 50°C	°C	
16)	Short circuit withstand rating for 1 second	kA(rms)	
17)	Dynamic short circuit withstand rating	kA(peak)	
18)	Bus bar provided with		
	a. Insulating sleeve	Yes / No	
	b. Phase barriers	Yes / No	
	c. Cast resin shrouds for joint	Yes / No	
19)	Bus connections silver plated / made with anti-oxide grease		

S.No.	Description	Unit	Data
	C) Air Circuit Breaker		
20)	Make		
21)	Short circuit withstand rating for 1 second	kA(rms)	
22)	Short circuit breaking current	kA(rms)	
23)	Short circuit making current	kA(peak)	
24)	Maximum temperature rise over 50°C ambient	°C	
25)	Rated operating duty		
26)	Total tripping time (max.)	ms	
27)	Total closing time (max.)	ms	
	D) MCCB		
28)	Make		
29)	Type		
30)	Current rating		
31)	Short circuit current rating		
	E) Relays		
32)	Type & make of protection relay		
8.0	**415 V Distribution Board**		
	A) Switchgear Assembly		
1)	Make		
2)	Reference standard(s)		
3)	Rated voltage & frequency	V & Hz	
4)	Short circuit rating		
	Short circuit withstand rating for 1 second	kA(rms)	
	Dynamic short circuit withstand rating	kA(peak)	
5)	One minute power frequency withstand voltage	kV(rms)	
6)	Degree of Protection		
7)	Type of steel		
8)	Sheet steel thickness for load bearing member	mm	

S.No.	Description	Unit	Data
9)	Sheet steel thickness for enclosure & door	mm	
10)	Thickness for gland plate	mm	
11)	Construction		
12)	Overall dimension of each board	mm x mm x mm	
	B) Bus Bar		
13)	Material & grade of main horizontal bus bar		
14)	Material & grade of Earth bus bar		
15)	Maximum temperature rise over 50°C	°C	
16)	Short circuit withstand rating for 1 second	kA(rms)	
17)	Dynamic short circuit withstand rating	kA(peak)	
18)	Bus bar provided with		
	a· Insulating sleeve	Yes / No	
	b· Phase barriers	Yes / No	
	c. Cast resin shrouds for joint	Yes / No	
19)	Bus connections silver plated / made with anti-oxide grease		
	C) MCCB		
20)	Make		
21)	Type		
22)	Current rating		
23)	Short circuit current rating		
9.0	**SEALED MAINTENANCE FREE LEAD ACID BATTERY**		
1)	Manufacturer of battery		
2)	Quantity	Nos.	
3)	Applicable standard		
4)	DC System Voltage	V	
5)	Battery type		
6)	Type of Container		
7)	Type of the cell		

S.No.	Description	Unit	Data
8)	No. of Cells per battery		
9)	Rated cell voltage		
10)	Ampere Hour rating	AH	
11)	Battery capacity referred to a cell end voltage of 1.85	AH	
12)	Load cycle duration	Hours	
13)	10 hour rating at 27°C to 1.85V per cell	A	
14)	Minimum cell voltage during duty cycle	1.85 V	
15)	WH efficiency	>75 %	
16)	AH efficiency at 10 hour discharge rate	> 90%	
10.0	**BATTERY CHARGER**		
1)	Manufacturer's name and address		
2)	Type		
3)	Battery charger rating (Current & Voltage)	A / V	
	· Float		
	· Boost		
4)	Reference Standard		
5)	Degree of Protection of Panel		
6)	Load cycle duration	A	
7)	**Thyristor**		
	a) Make		
	b) Current rating	A	
8)	Efficiency of complete charger	%	
9)	Type of sheet steel & Thickness of sheet metal	mm	
11.0	**DG SET**		
	A) General		
1)	Name of the Supplier		
2)	Place of manufacture		
3)	Continuous Rating of DG set at 50 deg C design ambient	KVA	

S.No.	Description	Unit	Data
4)	Duty		
5)	Overall dimension (L x W x H)	m x m x m	
	B) Diesel Engine		
6)	Make & Place of manufacture		
7)	Model No.		
8)	Rating at 25°C intake air temperature		
9)	Derating factor for 50°C intake air temp.		
10)	Applicable standard		
11)	Engine type		
12)	Speed	rpm	
13)	Dry weight	Tons	
14)	Overall dimension (LXWXH)	m xmxm	
	C) Consumption		
15)	Specific fuel consumption at	g / kwh	
	· rated load		
	· 3 / 4 load		
	· 1 / 2 load		
	· 100 % load		
	· 110 % load		
16)	Lube oil consumption at rated load	g / kwh	
	D) Lube oil system		
17)	Engine lube oil capacity	litres	
18)	Oil type		
19)	Oil filter type		
20)	Oil cooler type		
21)	Type & rating of lube oil pump		
	E) Fuel System		
22)	Fuel type		

S.No.	Description	Unit	Data
23)	Capacity of fuel tank	litre	
	F) Starting System		
24)	Rated voltage	V	
25)	Battery capacity	AH	
26)	Permissible No. of starts		
27)	Starting time	Sec	
	G) Stack structure		
28)	Height	m	
29)	Exhaust pipe size		
30)	Material of stack support structure		
31)	Height of stack support structure		
	H) Fuel Tank		
32)	Capacity		
33)	Material		
	I) Generator		
34)	Make & Place of manufacture		
35)	Type & frame size		
36)	Applicable standard		
37)	Continuous Rating at 50°C & design ambient temperature & humidity at 95% with class F temperature limits		
38)	Degree of protection		
39)	Class of insulation for stator, rotor & exciter		
40)	Temperature rise over 50°C design ambient temperature	°C	
41)	Speed	RPM	
42)	Rated voltage	Volt	
43)	Full load current at rated voltage.	Amp	
44)	Rated PF		
45)	Over load capacity		
46)	Efficiency at rated p.f at 100% load	%	

S.No.	Description	Unit	Data
47)	Short circuit rating	kA	
48)	Type of excitation		
49)	Type of cooling		
50)	RTD's		
	· No. of winding RTD & type		
	· No. of bearing RTD & type		
51)	Weight	kg	
52)	Dimensions (L x W x H)	m x m x m	
53)	Rotor withdrawal space	m	
12.0	**CABLE TRAYS**		
	A) General		
1)	Name of the Supplier		
2)	Place of manufacture		
3)	Material		
4)	Thickness of Galvanising		
	B) Ladder type Tray		
5)	Sheet steel thickness		
6)	Tray Height		
	C) Perforated type Tray		
7)	Sheet steel thickness		
8)	Tray Height		
13.0	**CABLE TRAY SUPPORT SYSTEM**		
1)	Manufacturer		
2)	Place of manufacture		
3)	Type		
4)	Material (Hot rolled or cold rolled steel)		
5)	Thickness of steel		
6)	Thickness of galvanisation		

S.No.	Description	Unit	Data
14.0	**415 V POWER FACTOR IMPROVEMENT CAPACITOR BANK**		
	A) Assembly		
1)	Make		
2)	Reference standard(s)		
3)	Rated voltage & frequency	V & Hz	
4)	Degree of Protection		
5)	Type of steel		
6)	Sheet steel thickness for load bearing member	mm	
7)	Sheet steel thickness for enclosure & door	mm	
8)	Overall dimension	mm x mm x mm	
	B) Capacitor		
9)	Type and make of Capacitors		
10)	Rated voltage of each capacitor units		
11)	KVAr (at rated voltage and frequency of each unit		
12)	No. of capacitor units in each phase of each delta/ unit rating		
13)	Total number of capacitor units for each bank / bank rating		
14)	Maximum permissible over voltage and duration corresponding to the same		
15)	Maximum permissible operative over voltage (continuous)		
16)	Watt loss (maximum) per phase		
17)	Voltage withstand tests (capacitor units)		
18)	Impulse withstand voltage		
	c) Series reactors		
19)	Type and Make		
20)	Insulation Level		
21)	Rated current and voltage		
22)	Rated capacity / inductance		
23)	Compensation percent of series reactors		
24)	Rated short time current and specified duration		

S.No.	Description	Unit	Data
25)	Reactance at rated current		
26)	Load losses		
27)	Rated KVAR		
	D) Fuse		
28)	Name of the Manufacturer		
29)	Type		
30)	Reference standard		
31)	Rated Voltage (kV)		
32)	Rated Normal Current (A)		
33)	Rated rupturing capacity		
	E) Automatic control unit		
34)	Name of the Manufacturer		
35)	Type		
36)	Reference standard		
37)	List of control devices		
38)	Panel dimension		
39)	Make of APFC relay		
15.0	**POWER & CONTROL CABLES(FOR EACH VOLTAGE RATING)**		
1.	Make		
2.	Applicable standard		
3.	Cable size	Sq.mm	
4.	Rated voltage	V	
5.	Earthed/Unearthed grade		
6.	Continuous current rating at 50°C air ambient temperature (For single core cables rating shall be based on bonding screen at both the ends in trefoil form)	A	
7.	Continuous current rating at 40°C ground ambient temperature	A	
8.	Short circuit withstand current for 1 sec duration for		
a)	Conductor	kA rms	

S.No.	Description	Unit	Data
b)	Metallic screen	kA rms	
9.	Conductor		
a)	Material		
b)	Grade		
c)	Nominal cross sectional area	Sq.mm	
10.	Conductor screening		
a)	Material and type		
b)	Approx. thickness of extruded layer	mm	
11.	Insulation		
a)	Nominal thickness of insulation	mm	
b)	Type of curing		
c)	Identification of cores		
12.	Type of extrusion		
13.	Insulation screening		
a)	Material and type		
b)	Approx. thickness of extruded layer	mm	
14.	Metallic Screen		
a)	Material		
b)	Cross section area of screen		
15.	Inner sheath		
a)	Material		
b)	Thickness of sheath (min)	mm	
c)	Extruded or not		
16.	Armour		
a)	Type of material of armour wire		
b)	Dimension of wire	mm x mm	
c)	No. of armour wires		
17.	Outer sheath		

S.No.	Description	Unit	Data
a)	Material and type		
b)	Thickness of sheath	mm	
c)	Minimum Oxygen index		
d)	Minimum Temperature index		
e)	Maximum Smoke Density		
f)	Light Transmission		
g)	Maximum Acid gas emission		
18.	Overall diameters of cable	mm	
19.	Cable Drums		
a)	Type		
b)	Material		
16.0	**TELECOMMUNICATION SYSTEM**		
1.	EPABX sub System		
2.	Manufacturer		
3.	Type		
4.	Model No.		
5.	Name of the Collaborator		
6.	Place of manufacture		
7.	Capacity • Extensions • External lines		
8.	Power Consumption		
9.	Voltage rating of auxiliary supply to EPABX system		
10.	Overall Dimensions		
11.	Type of enclosure		
12.	Degree of protection		
13.	Thickness of enclosure		
14.	List of features provided		
15.	**Operator Console**		

S.No.	Description	Unit	Data
a)	Type		
b)	Make		
c)	Type of enclosure		
d)	List of features provided		
16.	**Telephone (to be provided for each type)**		
a)	Type		
b)	Model No.		
c)	List of features provided		
17.	**Battery and Charger**		
a)	Type of battery		
b)	AH rating		
c)	Backup time		
d)	Cell voltage		
e)	No. of cells		
f)	Make		
g)	Charger rating		
h)	Make and type of charger		
18.	**Main Distribution Frame**		
a)	Make		
b)	Type of enclosure		
c)	Degree of protection		
d)	Thickness of enclosure		
e)	Paint finish		
f)	Terminal block type and Make		
19.	Telephone Junction box		
a)	Make		
b)	Type of enclosure		
c)	Degree of protection		

S.No.	Description	Unit	Data
d)	Thickness of enclosure		
e)	Paint finish		
f)	Terminal block type and Make		
20.	**Telephone cables (For each type of cables)**		
i.	Make		
ii.	Applicable standard		
iii.	Cable size	Sq.mm	
iv.	Rated voltage	V	
v.	Conductor		
a)	Material		
b)	Grade		
c)	Nominal cross sectional area	Sq.mm	
vi.	Insulation		
a)	Nominal thickness of insulation	mm	
b)	Material		
vii.	Inner sheath material		
viii.	Armour		
a)	Type of material of armour wire		
b)	Dimension of wire	mm x mm	
c)	No. of armour wires		
ix.	Outer sheath		
a)	Material and type		
b)	Thickness of sheath	mm	
x.	Overall diameters of cable	mm	
xi.	Cable Drums		
a)	Type		
b)	Material		
xii.	Additional data		

S.No.	Description	Unit	Data
a)	Thickness and coverage of polyester tape	mm and %	
b)	Thickness and coverage of Al-mylar tape	mm and %	
c)	Size of ATC drain wire	mm x mm	
d)	Core to core capacitance	µF	
e)	Core to screen capacitance	µF	
f)	L/R ratio		
g)	Drain wire resistance	Ω/kM	
17.0	**ILLUMINATION SYSTEM**		
1	General purpose rail type LED lamp luminaire		
a)	Make		
b)	Catalogue no.		
2	Industrial trough type LED lamp luminaire		
a)	Make		
b)	Catalogue no.		
3	Corrosion proof type LED lamp luminaire		
a)	Make		
b)	Catalogue no.		
4	Dust proof & jet proof LED lamp luminaire		
a)	Make		
b)	Catalogue no.		
5	Commercial Mirror optics type surface mounting LED lamp luminaire		
a)	Make		
b)	Catalogue no.		
6	Commercial Mirror optics type recess mounting LED lamp luminaire for luxalon ceiling.		
a)	Make		
b)	Catalogue no.		
7	Commercial low glare Mirror optics type recess mounting LED lamp luminaire for luxalon ceiling.		
a)	Make		

S.No.	Description	Unit	Data
b)	Catalogue no.		
8	Mini light Compact LED lamp Luminaire.		
a)	Make		
b)	Catalogue no.		
9	Mirror optic surface mounting LED lamp Luminaire.		
a)	Make		
b)	Catalogue no.		
10	Mirror optic recess mounting LED lamp Luminaire.		
a)	Make		
b)	Catalogue no.		
11	Bulk head LED lamp Luminaire.		
a)	Make		
b)	Catalogue no.		
12	Down light LED lamp Luminaire.		
a)	Make		
b)	Catalogue no.		
13	Post top lantern type luminaire		
a)	Make		
b)	Catalogue no.		
14	Street lighting Luminaire.		
a)	Make		
b)	Catalogue no.		
15	Flood lighting Luminaire		
a)	Make		
b)	Catalogue no.		
16	LED Lamps(to be furnished for each rating)		
a)	Make		
b)	Type		

S.No.	Description	Unit	Data
c)	Lumen output (for each rating)	Lumens	
17	LED Lamps(to be furnished for each rating)		
a)	Make		
b)	Type		
c)	Lumen output (for each rating)	Lumens	
18	Lighting Panel (to be furnished for each type)		
a)	Make & Place of manufacture		
b)	Degree of protection		
c)	Rating & type of incomer	A	
d)	Rating & type of outgoing feeders	A	
e)	Short circuit rating of MCB		
19	Street Lighting Panel		
a)	Make & Place of manufacture		
b)	Degree of protection		
c)	Rating & type of incomer	A	
d)	Rating & type of outgoing feeders	A	
e)	Rating of contactor	A	
f)	Short circuit rating of MCB		
20	Switch box		
a)	Make & Place of manufacture		
b)	Material of enclosure		
c)	Type, model no. & rating of Switches	A	
d)	Type, model no. & rating of socket	A	
21	Lighting / Receptacle Panel (to be furnished for each type)		
a)	Make & Place of manufacture		
b)	Material of enclosure		
c)	Degree of protection		
d)	Rating & type of incomer	A	

S.No.	Description	Unit	Data
e)	Rating & type of outgoing feeders	A	
f)	Short circuit rating of MCB		
22	13A commercial Receptacles		
a)	Make & Place of manufacture		
b)	Type & model no.		
c)	Type & rating of switch	A	
d)	Type & rating of receptacle	A	
23	15/20A Receptacles		
a)	Make & Place of manufacture		
b)	Type of enclosure		
c)	Degree of protection		
d)	Type & rating of MCB	A	
e)	Type & rating of receptacle	A	
24	63A industrial Receptacles		
a)	Make & Place of manufacture		
b)	Type of enclosure		
c)	Degree of protection		
d)	Type & rating of MCB	A	
e)	Type & rating of receptacle	A	
25	Lighting poles		
a)	Make & Place of manufacture		
b)	Type & material		
c)	Height		
d)	Weight	kg	
e)	Diameter	mm	
f)	Bracket length	mm	
g)	Thickness of galvanizing		
26	Lighting Mast		

S.No.	Description	Unit	Data
a)	Make & Place of manufacture		
b)	Type		
c)	Height	M	
d)	Weight	kg	
e)	Thickness of galvanizing		
f)	Type & rating winch motor		
27	Wires		
a)	Make & Place of manufacture		
b)	Conductor material & size	Sq.mm	
c)	Applicable standard		
28	Rigid steel Conduit		
a)	Make & Place of manufacture		
b)	Size	mm	
c)	Applicable standard		
d)	Material		
e)	Duty		
f)	Thickness of galvanizing		
29	PVC Conduit		
a)	Make & Place of manufacture		
b)	Size		
c)	Applicable standard		
d)	Material		
e)	Duty		
30	Conduit Fittings		
a)	Make & Place of manufacture		
b)	Applicable standard		
c)	Material		
d)	Thickness of galvanizing		

S.No.	Description	Unit	Data
31	Junction Boxes (To be furnished for each type)		
a)	Make & Place of manufacture		
b)	Type of enclosure		
c)	Degree of protection		
d)	Type & rating terminal blocks		
32	Ceiling Fans		
a)	Make & Place of manufacture		
b)	Type & Size		
c)	Power rating		
d)	Make & type of electronic regulator		
33	Wall mounted Fans		
e)	Make & Place of manufacture		
f)	Type & Size		
g)	Power rating		
34	Exhaust Fans		
a)	Make & Place of manufacture		
b)	Type & Size		
c)	Power rating		
18.0	**CABLING ACCESSORIES**		
1	Termination Kits		
a)	Make:		
b)	Type:		
c)	Voltage Grade & Size:		
d)	Kit no. as per catalogue		
2	Straight Through Joints		
a)	Make:		
e)	Type:		
f)	Voltage Grade & Size:		

S.No.	Description	Unit	Data
g)	Kit no. as per catalogue		
3	Cable Glands		
a)	Make of gland:		
b)	Standards Applicable		
c)	Type of compression		
d)	Material:		
e)	Type of surface finish		
4	Cable Lugs		
a)	Make of lugs:		
b)	Standards Applicable		
c)	Type		
d)	Material:		
e)	Whether tinning provided for copper lugs		
5	Earthing Material		
a)	Make		
b)	Standards Applicable		
c)	Material and grade		
6	Lightning Protection System		
a)	Make		
b)	Standards Applicable		
c)	Material and grade		
7	Trefoil Clamps		
a)	Material		
b)	Type		
c)	Size		
d)	Short circuit withstand rating		
8	Omega Clamps		
a)	Make		

S.No.	Description	Unit	Data
b)	Material and type		
c)	Surface Treatment of steel clamps		
d)	Minimum thickness of Galvanization		
9	Nylon self-locking tie strips		
a)	Width (mm)		
b)	Tensile Strength (kg)		
10	Strip Clamps		
a)	Make		
b)	Material and type		
c)	Surface Treatment of steel clamps		
d)	Minimum thickness of Galvanization		
11	Ferrules		
a)	Make		
b)	Colour of ferrules		
c)	Colour of graving		
12	Tags		
a)	Make		
b)	Material		
c)	Marking		
d)	Size		
13	Fire Stop Seal System		
a)	Make & Place of manufacture		
b)	Type		
c)	Fire rating		
d)	Applicable standards for testing		
e)	Major Components of sealing system		
19.0	**UPS**		
1	General		

S.No.	Description	Unit	Data
a)	UPS rating	kVA/kW	
b)	Make		
c)	Make & place of manufacture		
d)	No. of UPS		
e)	Type		
f)	Reference Standard		
g)	In put AC Voltage with variation	V	
h)	Input Frequency , Hz with variation	Hz	
i)	Output Voltage with variation	V	
j)	Out put Frequency , Hz with variation	Hz	
k)	Design Ambient temperature		
l)	Efficiency of complete UPS (AC to AC)	%	
m)	DC System voltage	V	
n)	Total Harmonic distortion		
o)	Voltage regulation	%	
p)	Frequency regulation	%	
q)	Transient voltage regulation	%	
r)	Over load response of UPS		
s)	Dynamic response		
t)	Noise level	dB	
u)	Cooling		
v)	Communication interface		
w)	Heat dissipation	kW	
x)	Thickness of sheet metal		
y)	Dimensions in mm (LxDxH)		
z)	Weight of complete panel(kg)		
aa)	Paint shade – inside – out side		
bb)	List of protections/ indications/ metering/annunciations provided in UPS		

S.No.	Description	Unit	Data
2.	UPS Enclosure		
a)	Material		
b)	Thickness of sheet		
c)	Degree of protection		
3.	Charger/Rectifier		
a)	Make		
b)	Type		
c)	Current rating		
d)	Voltage rating		
4.	Static inverter		
a)	Make		
b)	Type		
c)	Current rating		
d)	Voltage rating		
e)	AC output voltage variation		
f)	Guaranteed efficiency		
g)	Total harmonic content at rated load		
5.	Static transfer switch		
a)	Make		
b)	Type		
c)	Current Rating	A	
d)	Voltage rating	V	
e)	Transfer time	m.sec	
6.	Manual by-pass switch		
a)	Make		
b)	Type		
c)	Current Rating	A	
d)	Voltage rating	V	

S.No.	Description	Unit	Data
7.	Voltage stabiliser		
a)	Make		
b)	Type		
c)	Capacity	kVA	
e)	Input voltage & no. of phase		
h)	Type of cooling		
i)	Class of insulation		
n)	Output volt with setting range		
o)	Voltage regulation for input variation of +/- 10% and 0 to 100% load variation and PF 0.6 to 1.0		
p)	Servomotor drive details		
q)	Output Current at Rated voltage	A	
s)	Efficiency at • Rated load • 75% load • 50% load	%	
8.	Input Transformer		
a)	Make		
b)	KVA rating	kVA	
c)	Voltage ratio, frequency & no. of phase		
d)	Vector group		
e)	Insulation class		
f)	Rated current		
	Output Transformer		
a)	Make		
b)	KVA rating	kVA	
c)	Voltage ratio, frequency & no. of phase		
d)	Vector group		
e)	Insulation class		
f)	Rated current		

S.No.	Description	Unit	Data
9.	MCCB		
a)	Make		
b)	Rating	A	
c)	Type		
10.	HRC and Semiconductor Fuses		
a)	Make		
b)	Type		
c)	Rating	A	
11.	Cables		
a)	Make		
b)	Type		
c)	Conductor material		
d)	Insulation material		
f)	Cable size between UPS-A & UPS-B	Sq.mm	
g)	Cable size between UPS & SCVS	Sq.mm	
20.0	**UPS Battery**		
1	Manufacturer of battery		
2	Quantity	Nos.	
3	Applicable standard		
4	DC System Voltage	V	
5	Battery type		
6	Type of Container		
7	Type of the cell		
8	Cell dimensions	mmxmmxmm	
9	Weight of complete cell • Without electrolyte • With electrolyte	Kg	
10	Plates • No.of positive plates per cell		

S.No.	Description	Unit	Data
	• Types of positive plates • Types of negative plates		
11	No. of Cells per battery		
12	Rated cell voltage		
13	Ampere Hour rating	AH	
14	Battery capacity referred to a cell end voltage of 1.85	AH	
15	Load cycle duration	Hours	
16	10 hour rating at 27°C to 1.85V per cell	A	
17	Minimum cell voltage during duty cycle	1.85 V	
18	WH efficiency	>75 %	
19	AH efficiency at 10 hour discharge rate	> 90%	
20	Float charging (Volt / cell , Amp)	V,Amp	
21	Boost charging in 10 hours (Volt / cell , Amp) • Start • Finish	V,Amp	
22	Maximum short circuit current for a dead short across terminals	KA	
23	Internal resistance of • Battery • Each cell of battery	Ohm	
24	Taps provided of cell No.		
25	Internal resistance of each cell of battery	Ohm	
26	Mounting arrangement		
27	Racks • Material • No.of racks • Overall dimension of rack		
21.0	**UPS DB**		
a)	Make		
b)	Type		
c)	Quantity		
d)	Voltage rating		

S.No.	Description	Unit	Data
e)	Current rating		
f)	Degree of protection		
g)	Material		
h)	Short circuit rating		
i)	Rating of incoming MCCB		
j)	Rating of outgoing MCCB feeders		
k)	Earth Busbar size		
l)	Thickness of sheet metal		
m)	Dimensions in mm (LxDxH)		
n)	Weight of DB (kg)		
o)	Paint shade – inside / out side		

SIGNATURE OF BIDDER _____

NAME _____

DESIGNATION _____

COMPANY SEAL

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2.0 PERFORMANCE GUARANTEES

The performance parameters that are to be guaranteed by the bidder are to be furnished in the Schedule of Guaranteed Data given below and the values provided therein shall be binding on

the bidder. The tolerance for acceptance shall be as per applicable codes and/or as mutually agreed.

The equipment shall be guaranteed to meet performance requirements required by this specification. Any rectification work required to meet the performance requirements shall be carried out until satisfactory results are obtained. All work related to correction and subsequent performance testing to prove stability/reliability shall be carried out with no extra cost to the Client.

The Client reserves the right to reject the equipment should the performance values fall short of those indicated in the Schedule of Guaranteed Data. In case the Client rejects the equipment, the Contractor shall replace the equipment with a new one and achieve the performance as guaranteed. The replacement shall be done within a reasonable period of time as indicated by the Client and with no extra cost to the Client.

Sl. No.	Item	Unit of Measurement	Guaranteed Value
1)	**DRY TYPE TRANSFORMER**		
a)	No load loss at rated voltage and rated frequency (Maximum)	kW	
b)	Load loss at rated power (Maximum)	kW	
c)	Temperature rise of winding over 50°C ambient	° C	
2)	**HT Switchgear**		
a)	Temperature rise of over 50°C ambient	° C	
3)	**Ring main Unit**		
a)	Temperature rise of over 50°C ambient	° C	
4)	LT Switchgear		
a)	Temperature rise of over 50°C ambient	° C	
5)	**Capacitor bank**		
a)	Guaranteed power factor improvement		
6)	**Illumination**		

a)	Guaranteed lux level-Indoor		
b)	Guaranteed lux level-outdoor		
7)	**Motors**		
a)	Energy efficiency class		
8)	**DG Set**		
a)	Rated prime output rating		
b)	Guaranteed specific fuel consumption at rated output		
c)	Guaranteed lub-oil consumption at rated output		
d)	Noise level		
e)	Stack emission limit		
f)	Vibration limit		

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