

Name of Work :- High Side Electrical works for Outreach Building at Permanent Campus of Of NU Rajgir.						
Document:		SOQ/BOQ FOR UNDERSTANDING THE SCOPE OF WORK. THE COST WILL BE APPLICABLE AS PER THE LOWEST PRICE BID AND ORDER ISSUED BY THE UNIVERSITY				
Sr.no	DSR'16 / MR Reference	Description	Unit	Total Quantity	Unit Rate	Total Amount
<b>ELECTRICAL WORKS</b>						
<b>1</b>		<b>Subhead 1 : HT panels</b>				<b>42,56,868.19</b>
		Supplying, installation, testing and commissioning of totally enclosed, fully extendable from both sides, roll on floor type, metal clad, indoor type, horizontal drawout horizontal isolation type, SCADA compatible, dust/ corrosion/vermin proof, HT panel suitable for 12kV, 630A, 25kA for 3 sec, internal arc tested ( from all sides viz. front, lateral and rear ) for rated fault current rating for 1s, fabricated out of CRCA / Aluzinc sheet steel throughout (thickness as per type test design), mounted upon suitable size ISMC-100 channel, properly grouted and undergone suitable tank process or better method (as per type test design), with all necessary internal power and control wiring complete with terminal blocks marking and ferruling including dc circuit wiring from battery charger to respective panel, interpanel and intrapanel ac/dc circuit wiring, copper busbars of suitable ratings for phase as well as earth, metallic separations of CRCA / Aluzinc sheet (thickness as per type test design) between each switchgear and control gear compartment, approved danger and arc flash signages, HMI screen for each panel and with all components as mentioned in BOQ, specifications and schedule, complete etc. as required.				
1.1	MR 1	<b>11 kV HT Panel - Single VCB panel</b>	Each	1	662858.94	6,62,858.94
1.1.1		<b>Incoming :</b>				
		Surge arrester (1 Nos.) 9kV,10kA, metal oxide varistor type surge arrester suitable for both lightning and switching surges, complete with its bushings and earthing terminations etc. as required.				
		Line PT (1 Nos.) 2 core line mounted, fixed type, 3 phase, cast resin, potential transformer with rated turn/voltage ratio of 11000/(1.732):110/(1.732), rated burden of 100 VA, 11kV rated inbuilt primary side fuse, 110V rated secondary and tertiary side fuses complete with isolating plugs as required. Core 1 : CL 0.5, star connected with neutral grounded for metering and indications. Core 2 : CL 3P, star connected with neutral grounded for protections.				
		VCB (1 Nos.) 11kV, 50Hz, 630A, 3P, 25kA for 3 sec rated SCADA compatible, drawout type, VCB breaker panel with 110 volts DC closing and tripping coils, with a provision of secondary trip coil and 230 Volts AC spring charging motor, locking magnet, inbuilt antipumping relay, potential free NO & NC contacts required in addition to 4 spare NO and 4 spare NC contacts, door interlocking, racking interlocking and any other controls or interlocks as described in specifications or schedules, solenoids, TNC switch and inbuilt earth switch, connected on the line side of VCB and mechanically interlocked with VCB, complete etc. as required.				
		Indication lamps (12 Nos.) LED type phase indication lamps suitable for 110V, 50Hz AC (red, yellow, blue) LED type Indication lamps for breaker, suitable for 110V DC supply (on, off, trip, test, service, spring charge, TCH, earth switch on) LED type Indication lamps for DC healthy, suitable for 110V DC supply				
		Numeric relay (1 Nos.) Numeric relay module with LCD display having following inbuilt protection functions : under voltage, over voltage, frequency, phase sequence, instantaneous overcurrent, instantaneous earth fault, overcurrent and earth fault, suitable to record and store at least 100 events with date and time with last five fault records stored in nonvolatile memory and with self supervision function, 4 spare digital binary inputs and 4 spare digital output contacts in addition to those required as per the scheme, SCADA & 61850 protocol with ethernet IP Port, breaker control (on/off) along with 3No. 11kV, 100/1A, 15VA, CL-5P10 current transformers, complete etc. as required. - 2Nos.  Numeric relay module (for safe tripping of transformer's 11kV feed breaker) with LCD display having following inbuilt protection functions : Restricted earth fault protection of transformer, high oil temperature, high winding temperature, sudden pressure, suitable to record and store at least 100 events with date and time with last five fault records stored in nonvolatile memory and with self supervision function, 4 spare digital binary inputs and 4 spare digital output contacts in addition to those required as per the scheme, SCADA & modbus communication protocol with ethernet IP Port, breaker control (on/off) along with 3No. 11kV, 100/1A, 15VA, CL-5P10 current transformers, complete etc. as required. - 2 Nos. Note : Numeric relays shall have a provision of by-passing the second harmonic current during transformer switching operation so that feed breaker does not trip during transformer switching.				
		Electro-mechanical relay (4 Nos.) Hinged armature type electromechanical master trip (lockout) relay complete with assembly- 1 Nos. Hinged armature type trip circuit supervision relay complete with assembly- 1 Nos. Hinged armature type dc fail relay complete with assembly- 1 Nos. PT fuse failure relay - 1 Nos.				
		Metering (1 Nos.) Multifunction meter with inbuilt selector switch for measurement of current, voltage, power factor, KVA, kVAh, KVAh, KVAR, frequency, %THD (upto 15th order), THDi, THDv, KWhr (both line and phase) and maximum demand recording and indicating etc. complete as per specifications, compatibility to SCADA along with ethernet IP port along with 3No. 11kV, 100/1A, 15VA, CL-0.5 current transformer as required - 1 No. 0-11000 volts analog type voltmeter with selector switch for Vr, Vy, Vb - 1 No.				
		Emergency trip button on front door at an accessible height -1 Nos.				
		Selector type auto / manual switch -1 Nos.				
		230 volt, 50Hz, AC operated Hooter with noise level of 80db at every 3 metres with acknowledge and reset push button-1 Nos.				
		16-window microprocessor based annunciation panel with visual LED indicator complete as per specifications and schedule as required. - 1 Nos.				
MR 2		<b>11 kV HT Panel - Substation (2 Incomer + 1 Bus coupler + 2 Outgoings)</b>	Each	1	3594009.25	35,94,009.25
		<b>Incoming :</b>				
		Surge arrester (2 Nos.) 9kV,10kA, metal oxide varistor type surge arrester suitable for both lightning and switching surges, complete with its bushings and earthing terminations etc. as required.				

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		Line PT (2 Nos.) 2 core line mounted, fixed type,3 phase, cast resin, potential transformer with rated turn/voltage ratio of 11000/(1.732):110/(1.732) ,rated burden of 100 VA, 11kV rated inbuilt primary side fuse,110V rated secondary and tertiary side fuses complete with isolating plugs as required. Core 1 : CL 0.5, star connected with neutral grounded for metering and indications. Core 2 : CL 3P, star connected with neutral grounded for protections.				
		VCB (2 Nos.) 11kV, 50Hz, 630A, 3P, 25kA for 3 sec rated SCADA compatible, drawout type, VCB breaker panel with 110 volts DC closing and tripping coils, with a provision of secondary trip coil and 230 Volts AC spring charging motor, locking magnet, inbuilt antipumping relay, potential free NO & NC contacts required in addition to 4 spare NO and 4 spare NC contacts, door interlocking, racking interlocking and any other controls or interlocks as described in specifications or schedules, solenoids, TNC switch complete etc. as required. 110V DC operated earth truck suitable for 11kV cable - 1 No.				
		Indication lamps (24 Nos.) LED type phase indication lamps suitable for 110V,50Hz AC (red, yellow, blue) - 2 Nos LED type Indication lamps for breaker, suitable for 110V DC supply (on, off, trip, test, service, spring charge,TCH,earth truck on) - 2 Nos LED type Indication lamps for DC healthy, suitable for 110V DC supply - 2 Nos				
		Numeric relay (2 Nos.) Numeric relay module with LCD display having following inbuilt protection functions : under voltage, over voltage, frequency , phase sequence, instantaneous overcurrent, instantaneous earth fault, overcurrent and earth fault, suitable to record and store at least 100 events with date and time with last five fault records stored in nonvolatile memory and with self supervision function, 4 spare digital binary inputs and 4 spare digital output contacts in addition to those required as per the scheme, SCADA & 61850 protocol with ethernet IP Port, breaker control (on/off) along with 3Nos. 11kV ,300/1A, 15VA, CL-5P10 current transformers, complete as per required.				
		Electro-mechanical relay (8 Nos.) Hinged armature type electromechanical master trip (lockout) relay complete with assembly- 2 Nos. Hinged armature type trip circuit supervision relay complete with assembly- 2 Nos. Hinged armature type dc fail relay complete with assembly- 2 Nos. PT fuse failure relay -2 Nos.				
		Metering (4 Nos.) Multifunction meter with inbuilt selector switch for measurement of current, voltage, power factor, KVA, kVAh, KVArh, KVAR, frequency, %THD (upto 15th order), THDi,THDv,KWWhr (both line and phase) and maximum demand recording and indicating etc. complete as per specifications, compatibility to SCADA along with ethernet IP port along with 3No. 11kV ,300/1A, 15VA, CL-0.5 current transformer as required - 2 Nos. 0-11000 volts analog type voltmeter with selector switch for Vr, Vy, Vb - 2 Nos.				
		Emergency trip button on front door at an accessible height -2 Nos.				
		Selector type auto / manual switch -2 Nos.				
		230 volt, 50Hz,AC operated Hooter with noise level of 80db at every 3 metres with acknowledge and reset push button-2 Nos.				
		16-window microprocessor based annunciation panel with visual LED indicator complete as per specifications and schedule as required. - 2 Nos.				
		<b>Busbar :</b>				
		Busbar (1 Set - 3P + E) Busbar made up of electrolytic grade high conductivity copper in tubular / rectangular cross section and suitable for 11 KV, TP 50 Hz, 630 A, 25 kA for 3 sec of required length and cross sectional area. Note : Concerning vendor needs to furnish the busbar calculations (for both phase and earth bus) at the time of GA approval and busbar size has to be as per the approved GA drawing.				
		Bus PT (2 Nos.) 2 core bus mounted, withdrawable type,3 phase, cast resin, potential transformer with rated turn/voltage ratio of 11000/(1.732):110/(1.732) ,rated burden of 100 VA, 11kV rated inbuilt primary side fuse,110V rated secondary and tertiary side fuses complete with isolating plugs as required. Core 1 : CL 0.5, star connected with neutral grounded for metering and indications. Core 2 : CL 3P, star connected with neutral grounded for protections. 110V DC operated earth truck suitable for 11kV bus - 1 No. 0-11000 volts analog type voltmeter with selector switch for Vr, Vy, Vb - 2 Nos. LED type phase indication lamps suitable for 110V,50Hz AC (red, yellow, blue) - 2 Nos				
		VCB Bus Coupler (1 No.) 11kV, 50Hz, 630A, 3P, 25kA for 3 sec rated SCADA compatible, drawout type, VCB breaker panel with 110 volts DC closing and tripping coils, with a provision of secondary trip coil and 230 Volts AC spring charging motor, locking magnet, inbuilt antipumping relay, potential free NO & NC contacts required in addition to 4 spare NO and 4 spare NC contacts, door interlocking, racking interlocking and any other controls or interlocks as described in specifications or schedules, solenoids, TNC switch and inbuilt earth switch / earth truck, connected on the line side of VCB and mechanically interlocked with VCB, complete etc. as required.  LED type Indication lamps for breaker, suitable for 110V DC supply (on, off, trip, test, service, spring charge,TCH,earth truck on) LED type Indication lamps for DC healthy, suitable for 110V DC supply				
		<b>Outgoing :</b>				
		Surge arrester (2 Nos.) 9kV,10kA, metal oxide varistor type surge arrester suitable fo both lightning and switching surges,complete with its bushings and earthing terminations etc. as required.				
		VCB (2 Nos.) 11kV, 50Hz, 630A, 3P, 25kA for 3 sec rated SCADA compatible, drawout type, VCB breaker panel with 110 volts DC closing and tripping coils, with a provision of secondary trip coil and 230 Volts AC spring charging motor, locking magnet, inbuilt antipumping relay, potential free NO & NC contacts required in addition to 4 spare NO and 4 spare NC contacts, door interlocking, racking interlocking and any other controls or interlocks as described in specifications or schedules, solenoids, TNC switch complete etc. as required.				

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		Indication lamps (18 Nos.) LED type Indication lamps for breaker, suitable for 110V DC supply (on, off, trip, test, service, spring charge,TCH,earth truck on) LED type Indication lamps for DC healthy, suitable for 110V DC supply				
		Numeric relay (4 Nos.) Numeric relay module with LCD display having following inbuilt protection functions : under voltage, over voltage, frequency , phase sequence,instantaneous overcurrent,instantaneous earth fault,overcurrent and earth fault, suitable to record and store at least 100 events with date and time with last five fault records stored in nonvolatile memory and with self supervision function, 4 spare digital binary inputs and 4 spare digital output contacts in addition to those required as per the scheme, SCADA & modbus communication protocol with RS-485 Port, breaker control (on/off) along with 3No. 11kV ,200/1A, 15VA, CL-5P10 current transformers, complete etc. as required. - 2Nos.  Numeric relay module (for safe tripping of transformer's 11kV feed breaker) with LCD display having following inbuilt protection functions : Restricted earth fault protection of transformer, high oil temperature, high winding temperature, sudden pressure, suitable to record and store at least 100 events with date and time with last five fault records stored in nonvolatile memory and with self supervision function, 4 spare digital binary inputs and 4 spare digital output contacts in addition to those required as per the scheme, SCADA & modbus communication protocol with RS-485 Port, breaker control (on/off) along with 3No. 11kV ,300/1A, 15VA, CL-5P10 current transformers, complete etc. as required. - 2 Nos. Note : Numeric relays shall have a provision of by-passing the second harmonic current during transformer switching operation so that feed breaker does not trip during transformer switching.				
		Electro-mechanical relay (6 Nos.) Hinged armature type electromechanical master trip (lockout) relay complete with assembly- 2 Nos. Hinged armature type trip circuit supervision relay complete with assembly- 2 Nos. Hinged armature type dc fail relay complete with assembly- 2 Nos.				
		Metering (2 Nos.) Multifunction meter with inbuilt selector switch for measurement of current, voltage, power factor, KVA, kVAh, KVARh, KVAR, frequency, %THD (upto 15th order), THDi,THDv,KWhr (both line and phase) and maximum demand recording and indicating etc. complete as per specifications, compatibility to SCADA along with ethernet IP port along with 3No. 11kV ,300/1A, 15VA, CL-0.5 current transformer as required				
		11kV ,300/1A, 15VA, CL-PS current transformer as required. - 3Nos for restricted earth fault				
		Emergency trip button on front door at an accessible height -2 Nos.				
		Selector type auto / manual switch -2 Nos.				
		230 volt, 50Hz,AC operated Hooter with noise level of 80db at every 3 metres with acknowledge and reset push button- 2 Nos.				
		16-window microprocessor based annunciation panel with visual LED indicator complete as per specifications and schedule as required.- 2 Nos.				
<b>2</b>		<b>Subhead 2 : Transformers</b>				<b>40,25,290.36</b>
2.1	MR 3	<b>500 kVA , 11/0.415 kV, distribution transformer</b>	Each	2	2012645.18	40,25,290.36
2.1		Supplying, installation testing and commissioning of, indoor type, air cooled, dry type, caste resin distribution transformer, suitable for 3 phase, 50HZ, AC supply with rated power of 500kVA, rated turn/voltage ratio of 11kV/0.415kV.Dyn 11 vector group, percentage impedance of 4%, air natural air natural (ANAN) mechanism,core made of good quality CRGO, windings made of double wound copper, insulation class F,approved danger and arc flash signages and with all components as mentioned in BOQ, specifications and schedule, complete etc. as required.				
2.1.1		Cable termination box with disconnecting facility for 11 KV XLPE cable at 11 KV side.				
2.1.2		Cable termination box with disconnecting facility for 1.1 KV XLPE cable at 0.415 KV side.				
2.1.3		On load tap changer +5 to - 15 % in the steps of 2.5 with AVR				
2.1.4		Bi directional rollers				
2.1.5		Earthing terminals.				
2.1.6		Rating and diagram plate.				
2.1.7		Winding temperature indicator. (WTI) along with RTD				
2.1.8		Marshalling box with watertight lockable cover lid and all associated accessories as per schedules and specifications.				
2.1.9		Remote tap changer circuit (RTCC) panel with all associated accessories as per schedules and specifications.				

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<b>3</b>		<b>Subhead 3 : Ring Main Unit</b>				<b>6,40,516.50</b>
3.1	MR 4	Fully compartmentalized, non extendable, dust/vermin/corrosion proof, powder coated, fully type tested, SCADA compatible (complete with fault passage indicator in loop in / loop out feeders, battery and battery charger, relay and other control accessories), internal arc tested for rated fault current rating for 1s (on front and lateral side), indoor type, metal enclosed, 4 function ring main unit mounted upon suitable size ISMC-100 channel, properly grouted and suitable for 11kV, 630A, 25kA for 3sec, 50Hz, AC with SF6 insulated compact switchgear enclosed in stainless steel tank (thickness as per type test design) having IP67 degree of protection, outer structure made up of 2mm thick CRCA sheet, internal partitions of 1.5mm thick CRCA, approved danger and arc flash signages and with all components as mentioned in BOQ, specifications and schedule, complete etc. as required.	Each	1	646921.67	6,40,516.50
		<b>Busbar</b> : Busbar made up of electrolytic grade high conductivity copper and suitable for 11 KV, TP 50 Hz, 630 A, 25 kA for 3 sec of required length and cross sectional area.				
		Function 1 & 2 : 11kV, 3P, 630A, 25kA for 3sec, 50Hz, AC, motorized, load break switch used as loop in feeder with termination facility for 11/11kV (UE) 3C x 300 sqmm aluminium armoured cable, auto/manual selector switch, VPIS (voltage presence indication system), inbuilt earth switch of suitable rating connected on the cable side and mechanically interlocked with load break switch, spring charge indication, mechanical rod for spring charge, digital ammeter with range 0-300A with inbuilt selector switch and 3Nos. 11kV, SUITABLE , current transformer, interlocks as described in specifications or schedules etc. complete etc. as required.				
		Function 3 & 4: 11kV, 50Hz, 630A, 3P, 25kA for 3 sec rated SCADA compatible, VCB breaker with 110 volts DC closing and tripping coils, with a provision of secondary trip coil and 110Vdc / 230 Volts AC spring charging motor, inbuilt antipumping relay, potential free NO & NC contacts required in addition to 4 spare NO and 4 spare NC contacts, LED indication (on, off, trip), emergency button, push buttons (on, off), auto/manual selector switch, termination facility for 11/11kV (UE) 3C x 300 sqmm aluminium armoured cable, VPIS (voltage presence indication system), inbuilt earth switch of suitable rating connected on the cable side and mechanically interlocked with VCB, spring charge indication, solenoids, interlocks as described in specifications or schedules complete etc. as required. Numeric relay module with LCD display having following inbuilt protection functions : instantaneous overcurrent, instantaneous earth fault, overcurrent and earth fault, suitable to record and store at least 100 events with date and time with last five fault records stored in nonvolatile memory and with self supervision function, SCADA & modbus communication protocol with ethernet IP Port complete etc. as required.				
<b>4</b>		<b>Subhead 4 : HT cables and terminations</b>				<b>14,03,498.44</b>
		<b>11 kV grade XLPE FRLS armoured power cables</b>				
4.1		Supplying 11KV/11KV (unearthed) grade, heavy duty XLPE insulated, FRLS type, armoured cables suitable for 11kV, 50Hz, AC system with inner and outer PVC sheath, outer sheath provided with FRLS insulation, galvanised steel wound armouring and with all components as mentioned in BOQ, specifications and schedule, complete etc. as required.				
4.1.1	MR - 5 .	3 core x 300 sq. mm	Meter	400	2794.96	11,17,985.89
4.1.2	MR - 6 .	3 core x 120 sq. mm	Meter	50	1652.98	82,648.98
		<b>11 kV grade cable laying</b>				
4.2	8.1	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 11 kV grade of following size direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc. as required.				
4.2.1	8.1.2	Above 120 sqmm and up to 400 sqmm	Meter	300	359.42	1,07,825.34
		<b>4.3</b> Laying of one number XLPE power cable of 11kV grade of following size in the existing RCC trench complete etc. as required.				
4.3.1	MR - 7 .	Upto 120 sqmm	Meter	50	43.43	2,171.50
4.3.2	MR - 8 .	Above 120 sqmm and up to 400 sqmm	Meter	100	79.79	7,979.00
		<b>11 kV grade cable terminations</b>				
4.4		Supplying and making indoor cable end termination with heat shrinkable jointing kit complete with all accessories including lugs suitable for following size of 3 core, XLPE aluminium conductor cable of 11kV grade as required.				
4.4.1	10.4.4	300 sqmm	Each	8	7787.79	62,302.30
4.5		Supplying and making outdoor cable end termination with heat shrinkable jointing kit complete with all accessories including lugs suitable for following size of 3 core, XLPE aluminium conductor cable of 11kV grade as required.				
4.5.1	10.5.4	300 sqmm	Each	1	11414.53	11,414.53
4.6		Supplying and making straight through cable jointing with cast resin compound, including ferrule and other jointing materials for following size 3 core, XLPE aluminium conductor cable of 11kV grade as required.				
4.6.1	10.3.4	300 sqmm	Each	2	5585.45	11,170.90
<b>5</b>		<b>Subhead 5 : LT cables and terminations</b>				<b>37,96,608.61</b>
		<b>1.1 kV grade XLPE FRLS armoured power cables</b>				
5.1		Supplying following 1.1kV grade, heavy duty XLPE insulated, FRLS type armoured cables suitable for 415V, 50Hz, AC system, with inner and outer PVC sheath, outer sheath provided with FRLS insulation, galvanised steel armouring (round or flat as mentioned) and with all components as mentioned in BOQ, specifications and schedule, complete etc. as required.				
5.1.1	MR - 9 .	3.5C X 300 sqmm aluminium conductor, A2XFY.	Meter	1082	1518.57	22,83,211.34
5.1.2	MR - 10 .	3.5C x 185 sqmm aluminium conductor, A2XFY.	Meter	356	983.83	9,58,335.93
5.1.3	MR - 11 .	3.5C x 50 sqmm aluminium conductor, A2XFY.	Meter	64	325.01	1,04,588.80
		<b>1.1 kV grade FRLS control cables</b>				
		Supplying following 1.1kV grade, XLPE insulated, FRLS type control cables, suitable for 415V, 50Hz, AC system, with inner and outer PVC sheath, outer sheath provided with FRLS insulation and with all components as mentioned in BOQ, specifications and schedule, complete etc. as required.				
5.2.1	MR - 12 .	2C X 2.5 sqmm copper conductor	Meter	100	74.12	7,411.66
5.2.2	MR - 13 .	4C X 2.5 sqmm copper conductor	Meter	100	134.51	13,450.79
		<b>1.1 kV grade cable laying</b>				
		Laying of one number PVC insulated and PVC sheathed/XLPE power cable of 1.1kV grade of following size in the existing RCC trench / Hume pipe / pipe complete etc. as required.				
5.3.1	MR - 14 .	Above 35 sqmm and up to 95 sqmm	Meter	57	37.37	2,145.79

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5.3.2	MR - 15 .	Above 95 sqmm and up to 185 sqmm	Meter	321	55.55	17,818.22	
5.3.3	MR - 16 .	Above 185 sqmm and up to 400 sqmm	Meter	866	73.73	63,820.69	
5.4	7.8	Laying and fixing of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size on cable tray as required.					
5.4.1	7.8.2	Above 35 sq. mm and upto 95 sq. mm (clamped with 25x3mm MS flat clamp)	Meter	6	59.10	377.05	
5.4.2	7.8.3	Above 95 sq. mm and upto 185 sq. mm (clamped with 25/40x3mm MS flat clamp)	Meter	36	73.57	2,622.11	
5.4.3	7.8.4	Above 185 sq. mm and upto 400 sq. mm (clamped with 40x3mm MS flat clamp)	Meter	216	115.79	25,056.00	
5.5		Supplying and making end termination with double compression brass gland and aluminum lugs for following size of PVC insulated and PVC sheathed /XLPE aluminum/Copper conductor cable of 1.1 KV grade of the following sizes as required The cost shall include the cost of crimping and all tools and accessories required to complete the job in full respect.					
6.6.1	MR - 17 .	3.5C X 300 sqmm aluminium conductor, A2XFY.	Each	96	3154.23	3,02,806.08	
6.6.2	MR - 18 .	3.5C x 185 sqmm aluminium conductor, A2XFY.	Each	6	1601.86	9,611.16	
6.6.3	MR - 19 .	3.5C x 50 sqmm aluminium conductor, A2XFY.	Each	2	1128.17	2,256.34	
5.6		Supplying and making and termination with single compression brass gland and aluminum lugs for 1.1kV grade following XLPE insulated, FRLS type control cables, suitable for 415V, 50Hz, AC system, The cost shall include the cost of crimping and all tools and accessories required to complete the job in full respect.					
5.6.1	MR - 20 .	2C X 2.5 sqmm copper conductor	Each	6	246.44	1,478.64	
5.6.2	MR - 21 .	4C X 2.5 sqmm copper conductor	Each	6	269.67	1,618.02	

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<b>6 Subhead 6 : Cable trays</b>						<b>3,25,513.12</b>
6.1		Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray (galvanisation thickness not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.			0.00	
6.1.1	4.6.1	100 mm width x 50 mm depth x 1.6 mm thickness	Metre	50	525.86	26,292.98
6.1.3	4.6.4	300 mm width x 50 mm depth x 1.6 mm thickness	Metre	100	847.89	84,788.83
6.1.4	4.6.6	450 mm width x 50 mm depth x 2 mm thickness	Metre	50	1235.05	61,752.32
6.2		Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray "bends" (galvanisation not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.				
6.2.1	4.7.1	100 mm width X 50 mm depth X 1.6 mm thickness	Each	6	985.38	5,912.30
6.2.3	4.7.4	300 mm width X 50 mm depth X 1.6 mm thickness	Each	12	1745.23	20,942.72
6.2.4	4.7.6	450 mm width x 50 mm depth x 2 mm thickness	Each	12	2634.12	31,609.47
6.3		Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray "Tee" (galvanisation not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.				
6.3.1	4.8.1	100 mm width X 50 mm depth X 1.6 mm thickness	Each	3	1134.94	3,404.82
6.3.3	4.8.4	300 mm width X 50 mm depth X 1.6 mm thickness	Each	6	2044.34	12,266.04
6.3.4	4.8.6	450 mm width x 50 mm depth x 2 mm thickness	Each	6	3106.91	18,641.48
6.4		Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray "Cross member" (galvanisation not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.				
6.4.1	4.9.1	100 mm width X 50 mm depth X 1.6 mm thickness	Each	2	1134.94	2,269.88
6.4.3	4.9.4	300 mm width X 50 mm depth X 1.6 mm thickness	Each	4	2044.34	8,177.36
6.4.4	4.9.6	450 mm width x 50 mm depth x 2 mm thickness	Each	4	3285.42	13,141.67
6.5		Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray "Reducer" (galvanisation not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.				
6.5.1	4.10.1	100 mm width X 50 mm depth X 1.6 mm thickness	Each	2	1922.52	3,845.05
6.5.3	4.10.3	300 mm width X 50 mm depth X 1.6 mm thickness	Each	4	3562.82	14,251.28
6.5.4	4.10.6	450 mm width x 50 mm depth x 2 mm thickness	Each	4	4554.23	18,216.93
<b>7 Subhead 7 : UPS</b>						<b>6,88,210.59</b>
		<b>UPS</b>				
7.1		Supplying, installation, testing and commissioning of online double conversion fully microprocessor based ,indoor type, compact UPS system of following rating with IGBT based PWM technology to achieve THD < 3% and input power factor of greater than 0.95 at 50% loading,suitable for three phase AC input voltage 380 V to 440 V, 50 Hz +3% / - 3 % and three phase AC output voltage 415 ± 1% volts & frequency 50 ± 0.5 Hz , inbuilt isolation transformer, necessary VRLA batteries of suitable size having 30 minutes back up time , mounting rack including and suitable size connecting cable (for UPS to Battery and battery to battery), static and maintenance bypass switch, SNMP card for RS232/ ethernet IP computability for operation and monitoring etc. with all components as mentioned in BOQ, specifications and schedule, complete etc. as required. Note : Concerning vendor needs to furnish the battery sizing calculations at the time of GA approval and battery size has to be as per the approved GA drawing.				
7.1.1	MR - 22 .	10 kVA	Each	1	688210.59	6,88,210.59

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<b>8</b>		<b>Subhead 8 : LT Panels</b>				<b>69,03,341.00</b>
8.1		Supply, installation, testing and commissioning of indoor floor mounted/ wall mounted, IP42, factory built, modular, sectionalised, compartmentalized, extendable type LT cubicle panel of suitable size suitable for operation on 433/415 volts, 50 Hz AC 3 phase 4 wire supply system fabricated from CRCA sheet steel of 2mm thick for frame work and covers, 3mm thick for gland plates with stiffeners wherever required, having vibration free structure chemically treated with seven tank process or better before painting for surface treatment and powder coated in approved shade, with suitable electrolytic grade high conductivity bus bars extensible, DMC/ SMC (whichever is superior) bus bar supports, with short circuit withstand capacity as mentioned ,bottom base channel of section not less than 100mmX 50mmX 5 mm thick, fabrication shall be done in transportable sections, entire panel shall have a common earth bar of required size at the rear with 2 Nos. earth stud, connections and interconnection with solid conductor wires / copper strips, neutral links, control wiring with 1.5 sqmm. & 2.5sqmm. PVC insulated FRLS copper conductor S/C cable for voltage & current respectively, including providing and fixing following switch gears and as per schedules ,technical specifications etc.complete etc. as required.				
8.1.1	MR - 23 .	<b>Main Incoming Panel</b>	Each	1	3859844.28	38,21,628.00
		<b>Incoming :</b>				
		Surge arrester (4 No.) 2kVp,75kA rated surge arrester suitable fo both lightning and switching surges,complete with suitable protection fuse (inbuilt) along with 160A, 36kA, FP, MCCB (Thermal magnetic based) and surge counter.				
		ACB (4 No.) 415V, 50Hz, 800A, 4P, 50kA for 1 sec rated SCADA compatible, electrical drawout (EDO) type, ACB breaker with microprocessor based inbuilt release having LSIG protection, 230 volts AC closing and tripping coils, spring charging motor, inbuilt antipumping feature, potential free NO & NC contacts, undervoltage/shunt coils as required in addition to 4 spare NO and 4 spare NC contacts, breaker trolley, door interlocking, racking interlocking and any other controls or interlocks as described in specifications or schedules complete etc. as required.- 3No.				
		Indication lamps (36 Nos.) LED type phase indication lamps suitable for 230V,50Hz AC (red, yellow, blue) - 4 Nos. LED type Indication lamps for breaker, suitable for 230V,50Hz AC supply (on, off, trip, spring charge,control supply healthy,ready to close) - 4 Nos.				
		Metering (4 No.) Multifunction meter with inbuilt selector switch for measurement of current, voltage, power factor, KVA, kVAh, KVArh, KVAR, frequency, %THD (upto 15th order), THDi,THDv,KWHr (both line and phase) and maximum demand recording and indicating etc. complete as per specifications, compatibility to SCADA along with ethernet IP port along with 3Nos. , 415V ,800/5A, 15VA, CL-0.5 current transformer as required and 4Nos. , 415V ,2000/5A, 15VA, CL-0.5 current transformer as required.				
		415V ,Suitable size, CL-PS current transformer for REF protection of transformer - 16 Nos.				
		Emergency trip button on front door at an accessible height -4 Nos.				
		Selector type auto / manual switch -4 Nos.				
		230 volt, 50Hz,AC operated Hooter with noise level of 80db at every 3 metres with acknowledge and reset push button-4 Nos.				
		8-window microprocessor based annunciation panel with visual LED indicator complete as per specifications and schedule as required. - 4 Nos.				
		PLC along with wiring complete as per logic required.				
		<b>Busbar :</b>				
		Busbar (1 Set - 4P + E) Busbar made up of electrolytic grade high conductivity aluminium in rectangular cross section and suitable for 415V, FP, 50 Hz, 800 A, 50 kA for 1 sec of required length and cross sectional area. Note : Concerning vendor needs to furnish the busbar calculations (for both phase and earth bus) at the time of GA approval and busbar size has to be as per the approved GA drawing.				
		Buscoupler 415V, 50Hz, 800A, 4P, 50kA for 1 sec rated SCADA compatible, electrical drawout (EDO) type, ACB breaker with microprocessor based inbuilt release having LSIG protection, 230 volts AC closing and tripping coils, spring charging motor, inbuilt antipumping feature, potential free NO & NC contacts, undervoltage/shunt coils as required in addition to 4 spare NO and 4 spare NC contacts, breaker trolley, door interlocking, n , off, trip lamps,racking interlocking and any other controls or interlocks as described in specifications or schedules complete etc. as required.- 1No.				

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		<b>Outgoing :</b>				
		ACB (2 No.) 415V, 50Hz, 800A, 4P, 50kA for 1 sec rated SCADA compatible, electrical drawout (EDO) type, ACB breaker with microprocessor based inbuilt release having LSIG protection, 230 volts AC closing and tripping coils, spring charging motor, inbuilt antipumping feature, potential free NO & NC contacts, undervoltage/shunt coils as required in addition to 4 spare NO and 4 spare NC contacts, door interlocking, racking interlocking and any other controls or interlocks as described in specifications or schedules complete etc. as required.- 1No.				
		Indication lamps (12 Nos.) LED type Indication lamps for ACB, suitable for 230V,50Hz AC supply (on, off, trip, spring charge,control supply healthy,ready to close) - 2 Nos.				
		Metering (2 No.) Multifunction meter with inbuilt selector switch for measurement of current, voltage, power factor, KVA, kVAh, KVArh, KVAR, frequency, %THD (upto 15th order), THDi,THDv,KWHR (both line and phase) and maximum demand recording and indicating etc. complete as per specifications, compatibility to SCADA along with ethernet IP port . - 1 Nos. 4Nos. 415V ,800/5A, 15VA, CL-0.5 current transformer as required. - 2 No.				
8.1.2	MR - 24 .	<b>Main Outgoing Panel</b>	Each	1	232300.00	2,30,000.00
		<b>Incoming :</b>				
		Surge arrester (2 No.) 2kVp,75kA rated surge arrester suitable fo both lightning and switching surges,complete with suitable protection fuse (inbuilt) along with 160A, 36kA, FP, MCCB (Thermal magnetic based) and surge counter.				
		ACB (2 No.) 415V, 50Hz, 800A, 4P, 50kA for 1 sec rated SCADA compatible, electrical drawout (EDO) type, ACB breaker with microprocessor based inbuilt release having LSIG protection, 230 volts AC closing and tripping coils, spring charging motor, inbuilt antipumping feature, potential free NO & NC contacts, undervoltage/shunt coils as required in addition to 4 spare NO and 4 spare NC contacts, door interlocking, racking interlocking and any other controls or interlocks as described in specifications or schedules complete etc. as required.- 1No.				
		Indication lamps (18 Nos.) LED type phase indication lamps suitable for 230V,50Hz AC (red, yellow, blue) - 2 Nos. LED type Indication lamps for ACB, suitable for 230V,50Hz AC supply (on, off, trip, spring charge,control supply healthy,ready to close) - 2 Nos.				
		Metering (2 No.) Multifunction meter with inbuilt selector switch for measurement of current, voltage, power factor, KVA, kVAh, KVArh, KVAR, frequency, %THD (upto 15th order), THDi,THDv,KWHR (both line and phase) and maximum demand recording and indicating etc. complete as per specifications, compatibility to SCADA along with ethernet IP port . - 1 Nos. 4Nos. 415V ,800/5A, 15VA, CL-0.5 current transformer as required. - 1 No.				
		Emergency trip button on front door at an accessible height -1 Nos.				
		Selector type auto / manual switch -2 Nos.				
		230 volt, 50Hz,AC operated Hooter with noise level of 80db at every 3 metres with acknowledge and reset push button-2 Nos.				
		8-window microprocessor based annunciation panel with visual LED indicator complete as per specifications and schedule as required. - 2 Nos.				



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		<b>Busbar :</b> Busbar (1 Set - 4P + E) Busbar made up of electrolytic grade high conductivity aluminium in rectangular cross section and suitable for 415V, FP, 50 Hz, 800 A, 50 kA for 1 sec of required length and cross sectional area. Note : Concerning vendor needs to furnish the busbar calculations (for both phase and earth bus) at the time of GA approval and busbar size has to be as per the approved GA drawing.				
		<b>Outgoing :</b> MCCB (9 No.) 415V, 50Hz, 400A, 4P, 50kA for 1 sec rated microprocessor based MCCB with inbuilt LSIG protection and TNC switch - 5 Nos. 415V, 50Hz, 100A, 4P, 50kA for 1 sec rated microprocessor based MCCB with inbuilt LSIG protection and TNC switch - 6 Nos.				
		Indication lamps (54 Nos.) LED type phase indication lamps suitable for 230V,50Hz AC (red, yellow, blue) - 11 Nos. LED type Indication lamps for MCCB, suitable for 230V,50Hz AC supply (on, off, trip)- 11 Nos.				
		Metering (9 No.) Multifunction meter with inbuilt selector switch for measurement of current, voltage, power factor, KVA, kVAh, KVArh, KVAR, frequency, %THD (upto 15th order), THDi,THDv,KWVhr (both line and phase) and maximum demand recording and indicating etc. complete as per specifications, compatibility to SCADA along with ethernet IP port . - 9 Nos. 4Nos. 415V , 400/5A, 15VA, CL-0.5 current transformer as required. -5 No. 4Nos. 415V , 100/5A, 15VA, CL-0.5 current transformer as required. - 6 No.				
8.1.3	MR - 25 .	<b>Sync Panel</b>	Each	1	2880230.13	28,51,713.00
		<b>Incoming :</b> Surge arrester (2 No.) 2kVp,75kA rated surge arrester suitable fo both lightning and switching surges,complete with suitable protection fuse (inbuilt) along with 160A, 36kA, FP, MCCB (Thermal magnetic based) and surge counter.				
		ACB (2 No.) 415V, 50Hz, 800A, 4P, 50kA for 1 sec rated SCADA compatible, electrical drawout (EDO) type, ACB breaker with microprocessor based inbuilt release having LSIG protection, 230 volts AC closing and tripping coils, spring charging motor, inbuilt antipumping feature, potential free NO & NC contacts, undervoltage/shunt coils as required in addition to 4 spare NO and 4 spare NC contacts, door interlocking, racking interlocking and any other controls or interlocks as described in specifications or schedules complete etc. as required.- 2No.				
		Indication lamps (18 Nos.) LED type phase indication lamps suitable for 230V,50Hz AC (red, yellow, blue) - 2 Nos. LED type Indication lamps for ACB, suitable for 230V,50Hz AC supply (on, off, trip, spring charge,control supply healthy,ready to close) - 2 Nos.				
		Metering (2 No.) Multifunction meter with inbuilt selector switch for measurement of current, voltage, power factor, KVA, kVAh, KVArh, KVAR, frequency, %THD (upto 15th order), THDi,THDv,KWVhr (both line and phase) and maximum demand recording and indicating etc. complete as per specifications, compatibility to SCADA along with ethernet IP port . - 1 Nos. 4Nos. 415V ,800/5A, 15VA, CL-0.5 current transformer as required. - 1 No.				
		Emergency trip button on front door at an accessible height -2 Nos.				
		Selector type auto / manual switch -2 Nos.				
		230 volt, 50Hz,AC operated Hooter with noise level of 80db at every 3 metres with acknowledge and reset push button-2 Nos.				
		8-window microprocessor based annunciation panel with visual LED indicator complete as per specifications and schedule as required. - 2 Nos.				
		PLC along with wiring complete as per logic required.				
		<b>Busbar :</b> Busbar (1 Set - 4P + E) Busbar made up of electrolytic grade high conductivity aluminium in rectangular cross section and suitable for 415V, FP, 50 Hz, 800 A, 50 kA for 1 sec of required length and cross sectional area. Note : Concerning vendor needs to furnish the busbar calculations (for both phase and earth bus) at the time of GA approval and busbar size has to be as per the approved GA drawing.				
		Buscoupler 415V, 50Hz, 800A, 4P, 50kA for 1 sec rated SCADA compatible, electrical drawout (EDO) type, ACB breaker with microprocessor based inbuilt release having LSIG protection, 230 volts AC closing and tripping coils, spring charging motor, inbuilt antipumping feature, potential free NO & NC contacts, undervoltage/shunt coils as required in addition to 4 spare NO and 4 spare NC contacts, breaker trolley, door interlocking, n , off, trip lamps,racking interlocking and any other controls or interlocks as described in specifications or schedules complete etc. as required.- 1No.				
		<b>Outgoing :</b> ACB (2 No.) 415V, 50Hz, 800A, 4P, 50kA for 1 sec rated SCADA compatible, electrical drawout (EDO) type, ACB breaker with microprocessor based inbuilt release having LSIG protection, 230 volts AC closing and tripping coils, spring charging motor, inbuilt antipumping feature, potential free NO & NC contacts, undervoltage/shunt coils as required in addition to 4 spare NO and 4 spare NC contacts, door interlocking, racking interlocking and any other controls or interlocks as described in specifications or schedules complete etc. as required.- 2No.				

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		Indication lamps (18 Nos.) LED type phase indication lamps suitable for 230V,50Hz AC (red, yellow, blue) - 2 Nos. LED type Indication lamps for ACB, suitable for 230V,50Hz AC supply (on, off, trip, spring charge,control supply healthy,ready to close) - 2 Nos.				
		Metering (2 No.) Multifunction meter with inbuilt selector switch for measurement of current, voltage, power factor, KVA, kVAh, KVAh, KVAR, frequency, %THD (upto 15th order), THDI,THDv,KVWhr (both line and phase) and maximum demand recording and indicating etc. complete as per specifications, compatibility to SCADA along with ethernet IP port . - 1 Nos. 4Nos. 415V ,800/5A, 15VA, CL-0.5 current transformer as required. - 1 No.				
		Emergency trip button on front door at an accessible height -2 Nos.				
		Selector type auto / manual switch -2 Nos.				
		230 volt, 50Hz,AC operated Hooter with noise level of 80db at every 3 metres with acknowledge and reset push button-2 Nos.				
		8-window microprocessor based annunciation panel with visual LED indicator complete as per specifications and schedule as required. - 2 Nos.				
<b>9</b>		<b>Subhead 9 : Digital voltage regulator</b>				<b>47,85,321.42</b>
9.1	MR - 26 .	Supplying, installation, testing and commissioning of totally enclosed,fully wired,indoor type,digital, stepless voltage regulator suitable to be fixed on the LT side of 500KVA transformer, with switching device, regulating transformer, auto operated ventilation fans for transformer cabinet, control circuitry and with all components as mentioned in BOQ, specifications and schedule, complete etc. as required.	Each	2	2392660.71	47,85,321.42
<b>10</b>		<b>Subhead 10 : Earthing &amp; Miscellaneous works</b>				<b>10,20,553.89</b>
10.1	6.2	Providing and fixing of lightning conductor finial , made of 25mm dia 300mm long Copper tube, having single prong at top, with 85mm dia 6mm thick G.I. base plate including holes etc. complete etc. as required.	Each	4	366.65	1,466.62
10.2	6.7	Providing and fixing G.I. tape 20 mm X 3 mm thick on parapet or on surface of wall for lightning conductor and external lighting complete etc. as required. (For Horizontal run).	Meter	80	79.60	6,368.21
10.3	6.8	Providing and fixing G.I. tape 20 mm X 3 mm thick on parapet or on surface of wall for lightning conductor complete etc. as required. (For vertical run).	Meter	20	120.61	2,412.20
10.4	6.12	Providing and fixing testing joint, made of 20 mm X 3 mm thick G.I. strip, 125 mm long, with 4 Nos. of G.I. bolts, nuts, chuck nuts and spring washers etc. complete etc. as required.	Meter	20	88.05	1,760.91
10.5	MR - 27 .	Laying of earth mat in the substations by laying of 1.5 metre long copper rods of 17.5 mm dia in 1.5 metre deep trenches as per drawing, including exothermic welding of earth electrodes and connecting all exposed metallic parts and electrical components in the substation with copper earth strip of size 50 x 6 mm as per below mentioned item details complete etc. as required. NOTE : Seperate earth mat shall be provided for neutral.	Each	1	72947.25	72,947.25
		Excavation of earth for laying mat - 400 cum				
		Driving of earth electrode. - 50 Nos.				
		Laying of earthmat copper bar including cutting, shaping and binding etc - 500 Metres				
		Preparation of joints, proper making and welding of main earthmat bar joints with exothermic welding.- 50 Nos.				
		Welding of riser strip with earthmat - 75 Metres				
10.6	MR - 28 .	Providing and fixing 50 mm X 6 mm GI strip on surface or in recess for connections etc.including the connection to earth electrode complete etc. as required.	Meter	300	149.48	44,844.00
10.9	5.16	Providing and fixing 6 SWG dia G.I. wire on surface or in recess for loop earthing as required.	Meter	150	44.63	6,693.86
10.10	5.20	Providing and fixing earth bus of 50 mm X 5 mm copper strip on surface for connections etc. as required..	Meter	250	1547.43	3,86,856.58
10.11	MR 29	Supplying and installing at approved location approved make fire buckets (6 No.) of 24 gauge galvanized steel sheet conforming to IS: 2546, standard 9 litre capacity and of round bottom shape, painted white inside and red outside and black on the bottom, inscribed with letters "FIRE" in black and gold. Cost shall be inclusive of providing MS stand duly painted over a coat of primer.	Each	1	6911.43	6,911.43
10.12	MR - 30 .	Supplying, installation, testing and commissioning of totally enclosed, indoor type IP-42 rated, fully wired, 10 Amp, battery charger cum DCDB ( for DCDB refer single line diagram for substation auxillary ), suitable for 110V bipolar DC, complete with 50 AH VRLA batteries (external), battery rack, interconnecting cables, battery charger, DC bus, DC MCBs, controller and with all components as mentioned in BOQ, specifications and schedule, complete etc. as required.	Each	1	294278.65	2,94,278.65
10.13	7.10	Supplying and fixing cable route marker with 10 cm X 10 cm X 5 mm thick G.I. plate with inscription there on, bolted /welded to 35 mm X 35 mm X 6 mm angle iron, 60 cm long and fixing the same in ground as required.	Each	20	324.44	6,488.82
10.14	2.21	Providing and fixing M.V. danger notice plate of 200 mm X 150 mm, made of mild steel, at least 2 mm thick, and vitreous enameled white on both sides, and with inscription in single red colour on front side as required.	Each	5	179.71	898.54
10.15	2.22	Providing and fixing H.T. danger notice plate of 250 mm X 200 mm, made of mild steel, at least 2 mm thick, and vitreous enameled white on both sides, and with inscription in single red colour on front side as required.	Each	5	196.59	982.97
10.16	MR - 31 .	Providing & fixing in position 1000 mm wide , Electrical Insulating Rubber Mats as per IS 15652:2006, 2 mm thick, suitable up to 1.1 KV , fire retardant, no effect of acids, alkalis and transformer oils, moisture proof, high tensile strength and texture finish / cloth impression (Anti slip , marking on top)	Metre	50	1212.00	60,600.00
10.17	MR - 32 .	Providing & fixing in position 1000 mm wide , Electrical Insulating Rubber Mats as per IS 15652:2006, 2.5 mm thick, suitable up to 11 KV , fire retardant, no effect of acids, alkalis and transformer oils, moisture proof, high tensile strength and texture finish / cloth impression (Anti slip , marking on top).	Metre	50	2211.90	1,10,595.00
10.18	MR - 33 .	Supply & fixing in position approved shock treatment chart written in English Hindi and Local language. These charts shall be framed in wooden frame & covered with clear glass.	Each	4	138.37	553.48
10.19	MR - 34 .	Supply of Tool & First Aid Box with all necessary tools for maintenance of electrical installation & First aid.	Each	2	622.16	1,244.32
10.20	MR - 35 .	Providing & fixing ISI marked (IS:2878) portable CO2 type fire extinguisher type 4.5 kg capacity, Including valve, discharge hose of not less than 10 mm dia & 1 M long complete in all respects including initial filled with CO2 gas confirming to IS:307-1966 & filled to a filling rate of not more than 0.667 and wall suspension bracket complete in all respect.	Each	2	2902.74	5,805.48

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10.21	MR - 36 .	Providing & fixing of 6 kg ABC Type, Portable Fire Extinguisher, dry powder type (Gas Cartridge) conforming to IS: 15683 : 2006 with cylinder initially fully charged with dry powder, ISI marked confirming to IS:15683 : 2006 complete with standard discharge valve with tube, CI bracket for wall mounting complete in all respect.	Each	2	4422.79	8,845.58

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11		<b>Subhead 11 : AMC (Manpower Support to undertake the operation of the machinaries installed at site)</b>				<b>13,51,440.00</b>
		Providing following manpower support to undertake the operation of the machinaries installed at site : Min 3 Nos. certified electricians and 1 Nos. helper. However contractor may deploy more man power to ensure the smooth operation and pro rata calculation shall be performed on the basis of 3 No. electrician and 1 No. helper. The contractor has to maintain the service level agreement as stipulated in NIT.				
		AMC for 1st year	Job	1		6,75,720.00
		AMC for 2nd year	Job	1		6,75,720.00
						-