

**HSCC (India) Limited
as Executing Agency on behalf of
MINISTRY OF HEALTH & FAMILY WELFARE,
NEW DELHI**

TENDER

FOR

**External Electrical Works for
All India Institute of Medical Sciences
(AIIMS) at Mangalagiri Distt. Guntur (AP)**

under

**Pradhan Mantri Swasthya Suraksha Yojana
(PMSSY)**

**VOLUME – V
Bill of Quantities**

SEPTEMBER' 2018

Executing Agency



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Tender No. HSCC/PMSSY/AIIMS/Guntur/Ext-Elect/2018

ABSTRACT OF COST FOR EXTERNAL ELECTRICAL WORKS								
Name of Work: External Electrical works for All India Institute of Medical Sciences Campus (AIIMS) Mangalagiri at Guntur, A. P.								
Sub Head: External Electrical Works								
S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
1		TRANSFORMERS :						
		Design, manufacture, supply, installation, testing and commissioning of following transformers:						
1.1	MR	33KV ONAN with ON Load Tap Changer. (For Hostel, OPD, IPD & Academic blocks)						
		Supply, Installation, Testing & Commissioning of 12 MVA 3 phase, 33/ 11 kV outdoor, oil filled type Power Transformer, Dyn 11 vector group connection, having impedance as per IS, Transformer winding & Insulation : CRGO type core, 99.9% pure copper copper winding and neutral brought out for earthing, paper insulated Insulation & cooling : Class A insulation, Oil natural, Air Natural/ Oil Natural, Air Force (ONAN/ ONAF) type cooling. Suitable for continuously rated for full load, temperature rise not exceeding 45 deg C by thermometer in oil or 55 deg C by resistance. ON load tap changer on HT side with 2.5% step each, range (-) 15% and (+) 5% along with RTCC Panel. Primary side cable termination box shall be suitable for 33 KV, 2 x 3C X 300 Sqmm XLPE cable and 11 kV side terminal box shall be suitable for termination of 11 KV, 3 x 3C x 300 sq.mm XLPE AL. cable. Transformer should be as per IS standards or ammended upto date. Civil foundation as per the manufacturer recomendation is also in the scope. Price of civil work included in the items.						
		The transformer shall be supplied with following Fitting & Accessories:						
		All standard fitting viz Humidistat for Alarm and Trip						
		Transformer Oil Temperature Alarm & Tripping						
		Winding temperature relay unit with Alarm and trip						
		Oil Level Low Alarm with trip						
		Electronic temperature controlled with RTD.						
		Gas Pressure Relays						
		OLTC Oil Surge Relay						
		3 No. 1 phase, 30 kV, 10 kA discharge current, class-II Surge arresting device for protection against lightning including Structural support for mounting lightning arrester on the body above HT bushing.						
		Buchholz relay of double float type with high gas pressure alarm & trip suitable for 24 volts DC supply. With wiring upto marshalling Box & RTCC Panel.						
		1 No. 650/5A, 5P10, 10 VA, Protection class, CT after Neutral trifurcation point forbackup earth faul protection (51S).						
		Outdoor type Marshalling box with RS-485 communication port for BMS integration to monitor all transformer parameters or having 2 No. potential free contact for alram, trip & annunciation (one for BMS and one for control system).						

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
		The transformers shall have bi-directional rollers, winding temperature indicator, oil temperature indicator and Buchholz relay with wiring up to the marshalling box and RTCC Panel complete. The transformers shall have first filling of oil, weather proof HT cable box. The transformer shall have suitable disconnecting chamber at the ends with min 8mm thick non-magnetic gland plate, including M.S. channel and suitable size foundation complete with earth terminals/ lifting lugs and other standard accessories as required, as per relevant IS to successfully test & commission the Power Transformer as described above and technical specification.	2	Set		11,491,825	-	22,983,650
1.2	MR	33kV ONAN with ON Load Tap Changer. (For Residential blocks)						
		Supply, Installation, Testing & Commissioning of 2 MVA 3 phase, 33/ 11 kV outdoor, oil filled type Power Transformer, Dyn 11 vector group connection, having impedance as per IS, Transformer winding & Insulation: CRGO type core, 99.9% pure copper copper winding and neutral brought out for earthing, paper insulated Insulation & cooling: Class A insulation, Oil natural, Air Natural/ Oil Natural, Air Force (ONAN/ ONAF) type cooling. Suitable for continuously rated for full load, temperature rise not exceeding 45 deg C by thermometer in oil or 55 deg C by resistance. ON load tap changer on HT side with 2.5% step each, range (-) 15% and (+) 5% along with RTCC Panel. Primary side cable termination box shall be suitable for 33 KV, 2 x 3C X 300 Sqmm XLPE cable and 11 kV side terminal box shall be suitable for termination of 11 kV, 2 x 3C x 300 sq.mm XLPE AL. cable. Transformer should be as per IS standards or ammended upto date.Civil foundation as per the manufacturer recommendation is also in the scope. Price of civil work included in the items.						
		The transformer shall be supplied with following Fitting & Accessories:						
		All standard fitting viz Humidistat for Alarm and Trip						
		Transformer Oil Temperature Alarm & Tripping						
		Winding temperature relay unit with Alarm and trip						
		Oil Level Low Alarm with trip						
		Electronic temperature controlled with RTD.						
		Gas Pressure Relays						
		OLTC Oil Surge Relay						
		3 No. 1 phase, 30 kV, 10 kA discharge current, class-II Surge arresting device for protection against lightning including Structural support for mounting lightning arrester on the body above HT bushing.						
		Buchholz relay of double float type with high gas pressure alarm & trip suitable for 24 volts DC supply. With wiring upto marshalling Box & RTCC Panel						
		1 No. 150/5A, 5P10,10 VA, Protection class, CT after Neutral trifurcation point for backup earth fault protection (51S).						
		Outdoor type Marshalling box with RS-485 communication port for BMS integration to monitor all transformer parameters or having 2 No. potential free contact for alarm, trip & annunciation (one for BMS and one for control system).						

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
		The transformers shall have bi-directional rollers, winding temperature indicator, oil temperature indicator and Buchholz relay with wiring up to the marshalling box and RTCC Panel complete. The transformers shall have first filling of oil, weather proof HT cable box. The transformer shall have suitable disconnecting chamber at the ends with min 8mm thick non-magnetic gland plate, including M.S. channel and suitable size foundation complete with earth terminals/ lifting lugs and other standard accessories as required, as per relevant IS to successfully test & commission the Power Transformer as described above and technical specification.	2	Set		2,513,609	-	5,027,218
1.3	MR	11kV ONAN with ON Load Circuit Tap Changer. (For IPD & Academic Blocks)						
		Design, supply, installation, testing & commissioning of 2500kVA continuous duty cycle, 11kV/415V or 433V, 3 phase, 50Hz, Dyn-11 vector group, step down, outdoor type, copper wound, ONAN type transformers with OLTC, RTCC & AVR complete with all accessories including Bucholz relay with alarm and trip contact, OTI with alarm & trip contact and WTI with alarm and trip contact, fittings and conforming to specifications. Tap changing range shall be +15% to -15% in steps of 2.5%. Transformer shall have Cable box for 11kV XPLE cable on HT side and Busduct/ cable box on 415V or 433V voltage side. Control wiring for from trafo. to RTCC and AVR shall be included in the cost. Transformer shall be as per IS : 1180 ammendment upto date and transformer losses as per latest ECBC code of India & ammendment upto date.Civil foundation as per the manufacturer recomendation is also in the scope. Price of civil work included in the items.	5	Set		2,759,102	-	13,795,510
		TOTAL CARRIED OVER TO SUMMARY					-	41,806,378

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
2		HT PANEL						
2.1	MR	33KV FIVE PANEL HT VCB (INDOOR)- TWO INCOMERS, ONE BUS COUPLER AND TWO OUT GOINGS IN IP-44 ENCLOSURE, INSIDE A ROOM (For Residential, Hostel, OPD, IPD & Academic blocks)						
		Design, manufacture and supply of 5 panel, 33 kV HT VCB switch board with following accessories:						
		Each Incoming:						
		1250A, 33kV, 1000MVA for 3 Sec., TP, horizontally isolated, horizontally drawout type, motorised spring charged, closing mechanism, motor voltage 230V AC, shunt tripping & closing coil voltage 24V DC, electrically operated, trip free, dust & vermin proof, vacuum circuit breaker (VCB) with mechanical & Electrical OFF/ ON indicators & provided with following:						
		1 No.						
		CT chamber with double wound single phase, cast resin CT, 15VA burden with core-1 for metering (CL-1) and core-2 for protection (CL-5P10) and of 250/5/5A ratio or as required.						
		3 Nos.						
		Micro-processor based, communicable type IDMT relay with 3 elements for over current (50% - 200%) and 1 element for earth fault protection (10% -40%) & with high set element for three phases. Relay shall be with fault indications.						
		1 Set						
		Differential protection Relay						
		1 Set						
		Anti Pumping Relay						
		1 Set						
		Master Trip Relay						
		1 Set						
		Trip circuit supervision relay						
		1 Set						
		Potential transformers, 3 phase, 3 limb, drawout type, resin cast 33000/ (Root 3)/ 110/ (Root 3) ratio class 1 accuracy, 150 VA burden, with HV fuse on primary side and MCB/ MPCB on secondary side.						
		1 Set						
		6 Windows Annunciator with Hooter & Accept Button:						
		1 window for over current trip						
		1 window for earth fault trip						
		1 window for master trip relay						
		1 window for emergency stop push button						
		2 windows spare						
		1 Set						
		Digital Multifunction meter with MDI, communicable type (V, A, Hz PF, KVA, KVARH, KWH, KVAR, KVAH, KW).						
		1 Set						
		Voltmeter with selector switch.						

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
			1 Set					
		Ammeter with selector switch.						
			1 Set					
		A set of breaker ON/ OFF/ Trip/ DC control supply healthy/ Trip circuit healthy/ Spring Charged VCB in test/ VCB in service & R,Y,B Phase Indication Lamps.						
			1 Set					
		Emergency stop push button						
			1 Set					
		4 NO/ 4 NC breaker auxiliary contacts						
			1 Set					
		Control:- T-N-C (Trip, Neutral, Close) breaker control switch with indication arrangement, pistol grip type.						
			1 Set					
		All control wiring with protection & test terminal block as required.						
			1 Set					
		Strip heater with thermostat for moisture absorption.						
			1 Set					
		Suitable for connection to 2 x 3C x 300sq.mm. Cross linked polythelene (XLPE) 33kV cables or as called for.						
			1 Set					
		Cable box for 2 x 3C x 300sq.mm 33kV XLPE Al. conductor cable.						
			1 Set					
		HT Danger Plate						
			1 Set					
		Each Incoming as described above.						
			2 Sets					
		Bus Bars:						
		1250A, 33kV, 1000MVA for 3 Sec., 3phase, Electrolytic grade copper bus bars.						
			1 Set					
		Bus Coupler:						
		1250A, 33kV, 1000MVA for 3 Sec., TP, horizontally isolated, horizontally drawout type, motorised spring charged, closing mechanism, motor voltage 230V AC, shunt tripping & closing coil voltage 24V DC electrically operated, trip free, dust and vermin proof, vacuum circuit breaker (VCB) with mechanical & Electrical OFF/ ON indicators & provided with following:						
			1 No.					
		A set of breaker ON/ OFF/ Trip/ Spring Charged VCB in test/ VCB in service indication lamp.						
			1 Set					
		Emergency stop push button						
			1 Set					
		4 NO/ 4 NC breaker auxiliary contacts						
			1 Set					
		Control:- T-N-C (Trip, Neutral, Close) breaker control switch with indication arrangement, pistol grip type.						
			1 Set					

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
		All control wiring with protection & test terminal block as required.	1 Set					
		Strip heater with thermostat for moisture absorption.	1 Set					
		Each Outgoing:						
		1250A, 33kV, 1000MVA for 3 Sec., TP, horizontally isolated, horizontally drawout type, motorised spring charged, closing mechanism, motor voltage 230V AC, shunt tripping & closing coil voltage 24V DC electrically operated, trip free, dust & vermin proof, vacuum circuit breaker (VCB) with mechanical & Electrical OFF/ ON indicators & provided with following:	1 No.					
		CT chamber with double wound single phase, cast resin CT, 15VA burden with core-1 for metering (CL-1) and core-2 for protection (CL-5P10) and of 250/5/5A ratio or as required.	3 Nos.					
		Ammeter with selector switch	1 Set					
		Micro-processor based, communicable type IDMT relay with 3 elements for over current (50% - 200%) and 1 element for earth fault protection (10% -40%) & with high set element for three phases. Relay shall be with fault indications.	1 Set					
		Differential protection Relay	1 Set					
		Anti Pumping Relay	1 Set					
		Master Trip Relay	1 Set					
		Trip circuit supervision relay	1 Set					
		A set of breaker ON/ OFF/ Trip/ DC control supply healthy/ Trip circuit healthy/ Spring Charged VCB in test/ VCB in service indication lamp.	1 Set					
		Auxiliary relays for transformer faults WTI, OTI and Buchholz Relay . (To be checked with the requirement of transformer i.e. for ONAN or Dry Type) for alarm & trip.	1 Set					
		12 window annunciator with Hooter & Accept Button:						
		1 window for over current trip						
		1 window for earth fault trip						
		1 window for winding temperature alarm						
		1 window for winding temperature trip						
		1 window for Oil temperature alarm						
		1 window for Oil temperature trip						
		1 window for Buchholz alarm						
		1 window for Buchholz trip						
		1 window for master trip relay						
		1 window for emergency stop push button						
		2 windows spare						

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
			1 Set					
		Emergency stop push button	1 Set					
		4 NO/ 4 NC breaker auxiliary contacts	1 Set					
		Control:- T-N-C (Trip, Neutral, Close) breaker control switch with indication arrangement, pistol grip type.	1 Set					
		All control wiring with protection & test terminal block as required.	1 Set					
		Strip heater with thermostat for moisture absorption.	1 Set					
		Cable box for 2 x 3C x 300 sq.mm 33KV XLPE Al. conductor cable.	1 Set					
		HT Danger Plate	1 Set					
		Each Outgoing as described above.	2 Sets					
		Note: Powerpack as required to be included (220V/24V DC), 7AH battery for each breaker module.						
		FIVE PANEL 33KV HT VCB PANEL AS DESCRIBED ABOVE	2	Set		3,866,077	-	7,732,154
		Important Note :						
		Both the incomers breakers & the Bus coupler breaker shall be Electrically & Mechanically interlocked to ensure only two breakers are 'ON' at a time.						
2.2	MR	11KV NINE PANEL HT VCB (INDOOR)- FOUR INCOMERS, ONE BUS COUPLER & FOUR OUTGOINGS IN IP-4X ENCLOSURE (For Residential Blocks)						
		Design, manufacture and supply of 9 panel, 11 kV HT VCB, 500MVA (26.3 KA) switch board with following accessories:						
		Incoming						
		1250A, 11kV, 500MVA for 3 Sec., TP, horizontally isolated, horizontally drawout type, motorised spring charged, closing mechanism, motor voltage 230V AC, shunt tripping & closing coil voltage 24V DC, electrically operated, trip free, dust & vermin proof, vacuum circuit breaker (VCB) with mechanical & Electrical OFF/ ON indicators & provided with following:	1 No.					
		CT chamber with double wound single phase, cast resin CT, 15VA burden with core-1 for metering (CL-1) and core-2 for protection (CL-5P10) and of 150/5/5A ratio.	3 Nos.					
		IDMT relay with 3 elements for over current (50-200%) and 1 element for earth fault protection (10-40%).						

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
			1 Set					
		Differential protection Relay	1 Set					
		Anti Pumping Relay	1 Set					
		Master Trip Relay	1 Set					
		Trip circuit supervision relay	1 Set					
		Potential transformers, 3 phase, 3 limb, drawout type, resin cast 11000/ (Root 3)/110/ (Root 3) ratio class 1accuracy, 100 VA burden, with HV fuse on primary side and MCB/ MPCB on secondary side.	1 Set					
		6 Windows Annunciator with Hooter:						
		1 window for over current trip						
		1 window for earth fault trip						
		1 window for master trip relay						
		1 window for emergency stop push button						
		2 windows spare						
		Digital Ammeter with inbuilt selector switch	1 Set					
		Digital Voltmeter with inbuilt selector switch	1 Set					
		A set of breaker ON/ OFF/ Trip/ DC control supply healthy/ Trip circuit healthy/ Spring Charged VCB in test/ VCB in service & R,Y,B phase indication lamps.	1 Set					
		Emergency stop push button	1 Set					
		Limit switches with 4 NO/ 4 NC breaker auxiliary contacts	1 Set					
		Control:- T-N-C (Trip, Neutral, Close) breaker control switch with indication arrangement.	1 Set					
		All control wiring with protection & test terminal block as required.	1 Set					
		Strip heater with thermostat for moisture absorption.	1 Set					
		Suitable for connection to 3R x 3C x 300sq.mm . Cross linked polythelene (XLPE) 11kV cables or as called for.	1 Set					
		Cable box for 3R x 3C x 300sq.mm 11kV XLPE Al. conductor cable.	1 Set					
		HT Danger Plate	1 Set					
		Incoming as described above.	4 Sets					

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
		Bus Bars:						
		1250A, 11kV, 500MVA for 3 Sec., 3phase, Electrolytic grade copper bus bars.	1 Set					
		Bus Coupler:						
		1250A, 11kV, 500MVA for 3 Sec., TP, horizontally isolated, horizontally drawout type, motorised spring charged, closing mechanism, motor voltage 230V AC, shunt tripping & closing coil voltage 24V DC, electrically operated, trip free, dust and vermin proof, vacuum circuit breaker (VCB) with mechanical & Electrical OFF/ ON indicators & provided with following:	1 No.					
		A set of breaker ON/ OFF/ DC control supply/ Spring Charged.	1 Set					
		Emergency stop push button	1 Set					
		Limit switches with 6 NO/ 6 NC breaker auxiliary contacts	1 Set					
		Control:- T-N-C (Trip, Neutral, Close) breaker control switch with indication arrangement.	1 Set					
		All control wiring with protection & test terminal block as required.	1 Set					
		Strip heater with thermostat for moisture absorption.	1 Set					
		Outgoings:						
		800A, 11kV, 500MVA for 3 Sec., TP, horizontally isolated, horizontally drawout type, motorised spring charged, closing mechanism, motor voltage 230V AC, shunt tripping & closing coil voltage 24V DC, electrically operated, trip free, dust & vermin proof, vacuum circuit breaker (VCB) with mechanical & Electrical OFF/ ON indicators & provided with following:	1 No.					
		CT chamber with double wound single phase, cast resin CT, 15VA burden with core-1 for metering (CL-1) and core-2 for protection (CL-5P10) and of 150 /5/5A ratio.	3 Nos.					
		Digital Ammeter with inbuilt selector switch	1 Set					
		IDMT relay with 3 elements for over current (50-200%) and 1 element for earth fault protection (10-40%) with high set.	1 Set					
		Differential protection Relay	1 Set					
		Anti Pumping Relay	1 Set					
		Master Trip Relay	1 Set					
		Trip circuit supervision relay	1 Set					
		A set of breaker ON/ OFF/ Trip/ DC control supply healthy/ Trip circuit healthy/ Spring Charged VCB in test/ VCB in service.	1 Set					

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
		Auxiliary relays for transformer faults <u>WTI, OTI and Bucholz Relay</u> . (To be checked with the requirement of transformer i.e. for ONAN or Dry Type) for alarm & trip.	1 Set					
		12 windows annunciator with hooter:						
		1 window for over current trip						
		1 window for earth fault trip						
		1 window for winding temperature alarm						
		1 window for winding temperature trip						
		1 window for Oil temperature alarm						
		1 window for Oil temperature trip						
		1 window for Buchloz alarm						
		1 window for Buchloz trip						
		1 window for master trip relay						
		1 window for emergency stop push button						
		2 windows spare						
		Emergency stop push button	1 Set					
		Limit switches with 4 NO/ 4 NC breaker auxiliary contacts	1 Set					
		Control:- T-N-C (Trip, Neutral, Close) breaker control switch with indication arrangement.	1 Set					
		All control wiring with protection & test terminal block as required.	1 Set					
		Strip heater with thermostat for moisture absorption.	1 Set					
		Cable box for 1R x 3C x 300 sq.mm 11kV XLPE Al. conductor cable.	1 Set					
		HT Danger Plate	1 Set					
		Outgoing as described above.	4 Sets					
		Note: Powerpack as required to be included (220V/24V DC), 7AH battery for each breaker module.						
		NINE PANEL 11KV HT VCB PANEL AS DESCRIBED ABOVE	1	Set		3,479,469	-	3,479,469
2.3	MR	11kV SINGLE PANEL HT VCB (INDOOR) IN IP-44 ENCLOSURE INSIDE A ROOM (For IPD Substation)						
		Design, manufacture and supply of Single panel, 11kV HT VCB switch board with following accessories:						

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
		Incoming						
		1250A, 11kV, 500MVA for 3 Sec., TP, horizontally isolated, horizontally drawout type, motorised spring charged, closing mechanism, motor voltage 230V AC, shunt tripping & closing coil voltage 24V DC, electrically operated, trip free, dust & vermin proof, vacuum circuit breaker(VCB) with mechanical & Electrical OFF/ ON indicators & provided with following:						
		1 No.						
		CT chamber with double wound single phase, cast resin CT, 15VA burden with core-1 for metering (CL-1) and core-2 for protection (CL-5P10) and of 150/5/5A ratio.						
		3 Nos.						
		Micro-processor based, communicable type IDMT relay with 3 elements for over current (50% - 200%) and 1 element for earth fault protection (10% -40%) & with high set element for three phases. Relay shall be with fault indications.						
		1 Set						
		Differential protection Relay						
		1 Set						
		Anti Pumping Relay						
		1 Set						
		Master Trip Relay						
		1 Set						
		Trip circuit supervision relay						
		1 Set						
		Potential transformers, 3 phase, 3 limb, drawout type, resin cast 11000/(Root 3)/110/(Root 3) ratio class 1accuracy, 150 VA burden, with HV fuse on primary side and MCB/ MPCB on secondary side.						
		1 Set						
		Digital Multifunction meter with MDI, communicable type (V, A, Hz PF, KVA, KVARH, KWH, KVAR, KVAH, KW).						
		1 Set						
		Voltmeter with selector switch.						
		1 Set						
		Ammeter with selector switch.						
		1 Set						
		A set of breaker ON/ OFF/ Trip/ DC control supply healthy/ Trip circuit healthy/ Spring Charged VCB in test/ VCB in service & R,Y,B Phase indication lamps.						
		1 Set						
		Auxiliary relays for transformer faults WTI, OTI and Bucholz Relay . (To be checked with the requirement of transformer i.e. for ONAN or Dry Type) for alarm & trip.						
		1 Set						
		12 Windows Annunciator with Hooter & Accept Button:						
		1 window for over current trip						
		1 window for earth fault trip						
		1 window for winding temperature alarm						
		1 window for winding temperature trip						
		1 window for Oil temperature alarm						
		1 window for Oil temperature trip						

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
		1 window for Buchloz alarm						
		1 window for Buchloz trip						
		1 window for master trip relay						
		1 window for emergency stop push button						
		2 windows spare						
		Emergency stop push button	1 Set					
		4 NO/ 4 NC breaker auxiliary contacts.	1 Set					
		Control:- T-N-C (Trip, Neutral, Close) breaker control switch with indication arrangement, pistol grip type.	1 Set					
		All control wiring with protection & test terminal block as required.	1 Set					
		Strip heater with thermostat for moisture absorption.	1 Set					
		Suitable for connection to 3C x 300 sq.mm. Cross linked polythelene (XLPE) 11kV cables or as called for incoming and out going cables.	1 Set					
		Cable box for 3C x 300sq.mm 11kV XLPE Al. conductor cable for incoming and out going cable	1 Set					
		HT Danger Plate	1 Set					
		Incoming as well as outgoing as described above.	1 Set					
		Bus Bars:						
		Link work as required of electrolytic grade copper bus bars, 11KV shrouded.	1 Set					
		Note: Powerpack as required to be included (220V/24V DC), 7AH battery for each breaker module.						
		SINGLE PANEL 11KV HT VCB PANEL AS DESCRIBED ABOVE	2	Set		388,077	-	776,154
2.4	MR	HT APFC PANEL: Automatic Power Factor Controller Panel with Capacitor panel [Indoor Type]						
		Supply, Erection, Testing and Commissioning of 11 kV 2000 kVAR, 0.2% reactor, with 15% Over voltage 5 Steps APFC Panel with communication provision for Electrical parameters KWH, KVAH, PF, HZ and ON, OFF, TRIP, FAULT, Suitable Ventilation and Temperature Indications and Capacitor Bank: 2652 kVAR, 12.65kV, 3 phase capacitor Panel in star configuration along with cast resin/ resin impregnated air cooled series reactors, cast resin neutral CT in a closed container detailed as per technical specification.	1	SET		4,197,455	-	4,197,455

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
2.5		DC POWER SYSTEM						
2.5.1	MR	BATTERY CHARGER						
		Design, Supply, Installation, Testing & Commissioning of Battery Charger Unit with maintenance free batteries as per the details & specifications given below:						
		TECHNICAL SPECIFICATIONS OF 24V/15A CVCC BATTERY CHARGER WITH POTENTIAL FREE CONTACT						
		Type : CVCC (constant voltage constant current)						
		Rated Input Voltage : 230 VAC						
		Input Voltage Tolerance : 180v to 270 V						
		Rated Input Frequency : 50 Hz.						
		Input Frequency Tolerance : ± 5%						
		Output Voltage : 27.5V ± .5V DC for 24V Battery Bank						
		Output Current : 0-15Amps.or as required/specified. (Contractor to check the load of all the relays, coils & lamps & confirm that 15 Amp will be adequate or suggest an alternate capacity.)						
		Primary : Normal Step-down						
		(F-THYRISTOR Controlled)						
		Secondary Rectification : Full Wave						
		Ripple filtration : 35,000 mfd /50						
		Surge Suppression time _ 5pico seconds						
		Spike suppression energy : 20 Joule						
		Short Circuit protection : Electronically						
		Recharge time : As per battery rating/Condition						
		Protections : Over Charge and low battery						
		Electronically controlled.						
		Indications : Float & Boost						
		Potential free contact : Mains ON / Charging/ ON/Boost/						
		Float/High Voltage Trip						
		Ventilation : Air cooled						
		Sealed maintenance free batteries with 30 minutes back-up in fully charged conditions.						
		Sheet steel enclosure / rack with ventilation.						
Notes:		1. Battery charger unit shall support: All 24V DC indication lamps, shunt trip coils & relays of Main LT Panel .						
		2. Contractor to check the load of all the relays, coils & lamps & confirm that <u>15 Amp</u> will be adequate or suggest an alternate capacity.						
		Battery charges as described above	2	Set		75,139	-	150,278
2.5.2	MR	DC DISTRIBUTION BOARD						
		Supply, Installation, Testing & Commissioning of DC Distribution Board comprising 1 no. 40A DP MCB as incomer & 4 Nos. 10A/ 16A DP MCB's as outgoing feeders for DC supply for operating indication lamps, shunt trip coil & relays of LT Panel.	2	Set		16,873	-	33,746

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
2.5.3	MR	AC DISTRIBUTION BOARD						
		Supply, Installation, Testing & Commissioning of AC Distribution Board comprising 1 no. 40A DP MCB as incomer & 6 Nos. 6A/ 10A /16A DP MCB's as outgoing feeders for AC supply to HT Panels & Battery charger unit.	2	Set		20,248	-	40,496
		TOTAL CARRIED OVER TO SUMMARY					-	16,409,752

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
3		D.G. SETS & HSD TANK						
3.1	MR	DG SET WITH REMOTE RADIATOR - IN ACCOUSTIC HOOD, 11 KV						
		Design, Manufacture, Supply, Unloading & shifting, Installation, testing, commissioning and alignment at site of Prime Duty continuous rated 4 stroke, Prime duty 2250 KVA DG Set with an alternator of standby duty 2500 KVA comprising of Engine of 1500 rpm, remote Radiator Cooled (to be mounted on top of DG set Canopy) , 11 KV 50 Hz- 3 phase prime (actual) rating diesel generating set (11000 Volts Alternator with PCCM or equivalent), With electronic AVR mounted on a common base frame. Alternator shall be complete with suitable terminal box with Aluminium link work to accomodate the Aluminium Armoured cables as may be required. Along with its Exhaust pipe & its insulation with all supporting structure & as per CPCB norms complete as required. Engine shall not be derated upto 50 deg.C ambient and suitable for bearing the starting current after changeover. Note: DG set shall be auto start within 3 seconds.						
		DG Set shall be complete with following accessories:						
	a.	3mm thick MS painted 990 litres Day Oil Tank with float & board level indicator						
	b.	Fully charged Lead Acid batteries with painted angle iron stand						
	c.	Battery leads						
	d.	Residential Silencer & Flexible coupling/ Bellows						
	e.	Base frame with Anti vibration mountings as required.						
		Supplying and fixing of suitable sizes Heavy class MS pipe for DG exhaust complete with bends, elbow, flanges etc including silencer and catalytic convertor exhaust pipe chimney 30 meter high or as per CPCB norms for exhaust of DG sets including foundation of chimney , fixing of LED Aviation light including its wiring , lighting arrestor including copper strips and earthing (2 strip per light aresstor and two earth pits with cooper plate earthing) etc. & supporting structure for each DG sestsas per pollution control board norms and as required.						
		O/M Manuals, Test Certificates & Warranty certificates:						
		DG Set shall have 1 set (Original) + 3 sets photocopies of engine & alternator O/M manuals, Test certificates of Engine & alternator, warranty certificates of engine, Alternator & Batteries etc.						
		Fuel Pump & Governor:						
		Engine fuel pump shall be with electrically operated actuator & electronic/ digital governor suitable for synchronization.						
		Alternator AVR:						
		Alternators shall be suitable for synchronization i.e. AVR with droop facility.						
		DG Set Controller:						
		The DG Set shall be complete with DG Controller. The controller shall be able to perform the following functions & monitor various parameters::						
	a.	Perform following functions:						
	i.	Manual Start/ Stop facility through key/ Push button & with remote input acceptance for remote start and with cranking relay. It should be able to perform AMF, Auto synchronizatn and Auto load sharing of DG Sets.						
	b.	Engine monitoring & protection:						
	i.	Lub oil pressure						
	ii.	Coolant temperature						
	iii.	Engine Speed						

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
iv.		Run Hour						
v.		Battery Voltage						
vi.		Low Lub oil pressure & warning						
vii.		High coolant temp. warning & shut down						
viii.		Low coolant level shut down						
ix.		Over speed shut down						
x.		Charging failure indication						
xi.		Low/ high battery voltage warning						
xii.		Fail to Crank/ Fail to start/ Shut down						
Note:		Accoustic enclosure to maintain 75dB at 1 mtr distance@ 75% load, from enclosure in all the direction.						
		Installation complete with AVM mounting, leveling and commissioning of D.G. Set and co-ordination with other agencies etc. complete with attached and allied accessories like silencer, fuel tank and batteries etc.						
		DG exhaust pipes and pipe installation as per norms and steel structures for mounting pipes at certain height as per norm inclusive.						
		11 KV 2250 KVA DG Set with Remote Radiator - In Accoustic Hood as described above.	3	Set		22,521,139	-	67,563,417
		Important Notes:						
1		All DG Sets in the out door installation irrespective of capacity has to be with acoustic hoods.						
2		Vendor/ supplier to check and ensure with the Owner/ PMC on the type of DG set i.e. with or without hood before quoting and supply, irrespective of what is mentioned in this BOQ/ Specifications.						
3		Vendor/ supplier to check and ensure with the Owner/ PMC on the type of DG set i.e. with heat exchanger or with radiator or with remote fluid cooler before quoting and supply, irrespective of what is mentioned in this BOQ/ Specifications.						
4		Vendor/ supplier to ensure suitability of the set from all aspects including need of the acoustic hood, type of the DG set like with heat exchanger or with radiator or with remote fluid cooler before quoting and supply, irrespective of what is mentioned in this BOQ/ Specifications.						
5		Vendor/ supplier to check, verify and confirm to Owner/ PMC the size of the exhaust pipe for the DG sets as per site requirement based on back-pressure calculations before quoting and supply, irrespective of what is mentioned in this BOQ/ Specifications.						
6		Vendor/ supplier to check, verify and confirm to Owner/ PMC the size of the cooling tower, pumps and piping for the DG sets as per site requirement before quoting and supply, irrespective of what is mentioned in this BOQ/ Specifications.						
7		Vendor/ supplier to check, verify and confirm to Owner/ PMC the ventilation requirement being provided for the DG Set area.						
8		Vendor/ supplier to assume complete responsibility of a technically correct and safe installation. Vendor/ supplier is adviced to collect all the details/ facts from Owner/ PMC and visit site before quoting/ supplying.						

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
9		Vendor/ supplier to to study architectural drawings and visit site to findout suitability of DG sets shifting into basement/ (DG set room/ location) through ramps/ hatches etc. and confirm to owners/ PMC the suitability or otherwise before quoting/ before accpting order/ before supply of equipments.						
10		civil work of DG foundation , baffle wall , foundation of chimney etc. as per manufacturer recommendation is inclusive in the item						
3.2		HSD TANK						
		Design, supply, installation, testing & commisioning of 30 KL underground MS diesel tank including all realted civil works foundation, fencing, platform, for unloading of diesel. Flame proof push buttons, pumps (one working & one standby) for supplying of diesel from this UG tank to day tanks of all the DG sets complete with cabling, earthing, piping, float switches etc. Extinguishers shall be as per fire norms. including all necessary approvals from chief controller of explosives. (Common header for this HSD tank and existing HSD tank to be considered to fill all DG sets)	1	Set		1,896,573	-	1,896,573
		TOTAL CARRIED TO SUMMARY					-	69,459,990

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
4		HT CABLES						
4.1	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.						
4.1.1	8.1.2	Above 120 sq. mm and upto 400 sq. mm	6655	Meter	298		1,983,190	-
4.2	8.2	Laying of one number additional PVC insulated and PVC sheathed/ XLPE power cable of 11 kV grade of following size direct in ground in the same trench in one tier horizontal formation including excavation, sand cushioning, protective covering and refilling the trench etc. as required.						
4.2.1	8.2.2	Above 120 sq. mm and upto 400 sq. mm	6655	Meter	212		1,410,860	-
4.3	10.1	Supplying and making indoor cable end jointing with cast resin compound, including lugs and other jointing materials, for following size of 3 core, XLPE aluminium conductor cable of 11kV grade as required.						
4.3.1	10.1.4	300 sq. mm	20	Each	1859		37,180	-
4.4	10.2	Supplying and making outdoor cable end jointing with cast resin compound, including lugs and other jointing materials, for following size of 3 core, XLPE aluminium conductor cable of 11 kV grade as required.						
4.4.1	10.2.4	300 sq. mm	72	Each	3330		239,760	-
		Laying of 33KV/ 33KV grade XLPE insulated, Inner sheath of Extruded PVC & Outer sheath of HR-PVC (Type ST-2), Aluminium conductor, armoured cable as per IS:7098 Part-2 (Un-Earthed) in existing RCC/ Brick trenches/ hume pipes/ cable tray including necessary clamping arrangement etc. and complete as approved.						
i.	MR	3C x 300 Sq.mm	770	Meter		298	-	229,460
4.5	MR	Supplying and making terminal joints for the following sizes of 33KV/ 33KV XLPE insulated, Inner sheath of Extruded PVC & Outer sheath of HR-PVC (Type ST-2), Aluminium conductor, armoured cable as per IS:7098 Part-2 (Un-Earthed) including terminal lugs, insulation tape, heat shrinkable kit complete as required.						
		3C x 300 Sq.mm (out door type)	32	Each		11,471	-	367,072
4.6	MR	RCC HUME PIPES						
		Supply and laying of following RCC hume pipes for road crossing for laying of HT Cables including necessary civil work such as road cutting, digging upto a min of 900mm depth/ path cutting with approvals etc. and back filling and making good as required/ approved including sealing the ends.						
i.		300 mm dia.	1660	RM		1,206	-	2,001,960

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
4.7	MR	CABLE TAGGING						
		Supply and fixing of cable tags of aluminum	25	No.		59	-	1,475
4.8		HT CABLES						
	MR	Supply of the following sizes of 11KV, 33KV XLPE insulated, PVC type ST-2 inner & outer sheath, Aluminium conductor, armoured cable as per IS:7098 Part-2 (UnEarthed).						
Note:		Leave sufficient cable loops at both the cable ends.						
		11 KV						
4.8.1	MR	11 KV, 3C x 300 Sq. mm	13310	Meter		1,548	-	20,603,880
		33 KV						
4.8.2	MR	33 KV, 3C x 300 Sq. mm	770	Meter		2,186	-	1,683,220
		Total Carried to Summary					3,670,990	24,887,067

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
5		BUSDUCT						
5.1	MR	BUS DUCT - INDOOR (IN AIR - OVER HEAD TYPE) IP 65						
		Manufacture, Supply, Installation, Testing and Commissioning of Sandwich Busway IP-65 , 1000 volts system Busduct 3 Phase, 4 Wire, sandwich construction Aluminium Bus Duct having 65kA short ckt for one Second with temperature rise of 55Deg. above ambient of 40deg. In extruded aluminium suitable for operation on 50Hz AC supply with 100% neutral complete with all accessories bends, flange ends. The Busway shall have a system of single bolt double head section jointing system. The bus duct suspension system shall be complete with steel rods, GI angle supports and dash fasteners etc. at required intervals for safe installation of bus ducts. Supporting system shall be fail proof even in earth quake situations, as per Sismic requirement at site.						
		Necessary flexible joints to be provided for building expansion joints and for thermal expansion as may be required.						
		100% sized Neutral as of phase current.						
i.		3200Amp, 65KA, 4P, IP 65, Aluminum Conductor including all the accessories/ horizontal & vertical bends. (from Main LT Panel to Chiller Panel Section-1, 2 & 3)						
a.	MR	Straight Run Horizontal as well as Vertical	180	RM		34,469	-	6,204,420
ii.		2000Amp, 65KA, 4P, IP 65, Aluminum Conductor including all the accessories/ horizontal & vertical bends. (from Main LT Panel to Capacitor Panel-1, 2, 3 & 4)						
a.	MR	Straight Run Horizontal as well as Vertical	72	RM		23,691	-	1,705,752
iii.		2000Amp, 65KA, 4P, IP 65, Aluminum Conductor including all the accessories/ horizontal & vertical bends. (from Main LT Panel to Academic)						
a.	MR	Straight Run Horizontal as well as Vertical	15	RM		23,691	-	355,365
iv		5000Amp, 65KA, 4P, in Tunnel - IP 65, Aluminum Conductor including all the accessories/ horizontal & vertical bends. (from Main LT Panel to IPD LT panel section-1, 2 & 3)						
a.	MR	Straight run Horizontal as well as Vertical	870	RM		58,000	-	50,460,000
v		5000Amp, 65KA, 4P, in Tunnel - IP 65, Aluminum Conductor including all the accessories/ horizontal & vertical bends. (from Main LT Panel to IPD Medical Equip. panel section-1 & 2)						
a.	MR	Straight run Horizontal as well as Vertical	580	RM		58,000	-	33,640,000

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
5.2	MR	BUS DUCT - OUTDOOR - IP 68						
Note:		Design, Manufacture, Supply, Installation, Testing and Commissioning of Cast Resin Busway 1000 volts system Busduct, 4bar - 3P & 1N, Aluminum conductor with aluminium busbar casted in homogenous insulated compound made epoxy resin mixed with fillers under vacume short circuit faust withstand for 1 sec as specified. IT will be as per IS 8623 IP68 degree of protection as per IEC 60529, having mechanical impact strength IK 10. Busduct design as per IEC 61439 part 1 & 6 amended up to date. The bus duct suspension system shall be complete with steel rods, GI angle supports and dash fasteners etc. at required intervals for safe installation of bus ducts. Supporting system shall be fail proof even in earth quake situations, as per Sismic requirement at site. Necessary flexible joints to be provided for building expansion joints & for thermal expansion as may be required.						
		100% sized Neutral as of phase current.						
i.		5000Amp, 65KA, 4P, IP 68, Aluminum Conductor including all the accesories/ horizontal & vertical bends. (from 5 nos. transformer to Main LT Panel) (Considered Cast Resin Bus Duct)						
a.	MR	Straight run Horizontal as well as Vertical	175	RM		68,357	-	11,962,475
		Total Carried to Summary					-	104,328,012

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
6		DISTRIBUTION BOARDS & PANELS:						
6.1	MR	UPS INPUT PANEL -OFFICE/ IT+LABS: (FOR IPD)						
		IP Rating : IP 42						
		Incomer						
		1No. 400A 35KA, FP, MCCB (fixed Thermal & fixed Magnetic releases) upto 250A, thermal-magnetic releases OR Micro-Processor based releases beyond 250A. MCCB shall have 1NO + 1NC auxiliary contacts + a trip contact.						
		Incomer Metering & Indication:						
		415V/ $\sqrt{3}$ / 110V/ $\sqrt{3}$ PT's, Cast Resin type, 3 Phase for metering & indications, suitable rated 6A, TP MPCB of the fault withstand capacity as of the panel on the primary side of PT & suitable rated 6A, TP MCB on the secondary side of PT. This metering PT shall be of Class-1 accuracy.						
		R,Y,B phase indication lamps (110V) LED Type						
		ON' & Trip indication lamps (110V) LED Type						
		Cast resin metering CT's for each phase of class-1 accuracy & of suitable burden & ratio						
		1 No. Digital VAF + PF Meter (110V) (With RS 485 Port)						
		Bus bars						
		500 A, TPN, Aluminium Bus bars of Electrolytic grade with heat shrinkable sleeves 35KA.						
		Outgoings :						
		4 No. 400A, 35 KA, FP MCCB (fixed thermal & fixed magnetic releases) upto 250A & beyond microprocessor based releases with KWH meter with RS-485 Port With ON/ Off/ trip indication lamps.						
		TVSS:						
		Supply, installation, testing & commissioning of 36 kA surge handling capacity TVSS with 10 mode protection including EMI & RFI filters and with inbuilt back up fuse protection, with 4P MCB of 50 kA breaking capacity and complete with wiring as required.						
		All UPS & UPS output panels to have a raw body earth bus & a dedicated earth bus on insulated supports.						
		Protections, Indication & metering as per general notes & specification of panel & switch boards						
		Surge Protection device to be earthed suitably as per manufacturers recommendation.						
		Vendor to ensure selection of MCCB & MCB through cascading effect to mitigate the prospective fault circuit current.						
		UPS INPUT PANEL -OFFICE/ IT+LABS as described above.	1	SET		204,576	-	204,576

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
6.2	MR	UPS OUTPUT PANEL OFFICE/ IT+LABS: (FOR IPD)						
		IP Rating : IP 42						
		Incomer						
		2 No. 400A 35 KA, TP MCCB and neutral isolation link 200% (fixed Thermal & fixed Magnetic releases) upto 250A, thermal-magnetic releases OR Micro-Processor based releases beyond 250A. MCCB shall have 1NO + 1NC auxiliary contacts + a trip contact.						
		Incomer Metering & Indication for each incomer:						
		415V/ $\sqrt{3}$ / 110V/ $\sqrt{3}$ PT's, Cast Resin type, 3 Phase for metering & indications, suitable rated 6A, TP MPCB of the fault withstand capacity as of the panel on the primary side of PT & suitable rated 6A, TP MCB on the secondary side of PT. This metering PT shall be of Class-1 accuracy.						
		R,Y,B phase indication lamps (110V) LED Type						
		ON & Trip indication lamps (110V) LED Type						
		Cast resin metering CT's for each phase of class-1 accuracy & of suitable burden & ratio						
		1 No. Digital Multifunction meter (110V) (With RS 485 Port)						
		Bus bars						
		500 A, 4P AL, Bus bars of Electrolytic grade with heat shrinkable sleeves 35 KA.						
		Outgoings:						
		3 Nos. 400A, 35 KA, TP+2N MCCB (fixed thermal & fixed magnetic releases) upto 250A & beyond microprocessor based releases with KWH meter with RS-485 Port With ON/ Off/ trip indication lamps.						
		2 Nos. 125A, 35 KA, TP+2N MCCB (fixed thermal & fixed magnetic releases) upto 250A & beyond microprocessor based releases with KWH meter with RS-485 Port With ON/ Off/ trip indication lamps.						
		2 Nos. 63A, 35 KA, TP+2N MCCB (fixed thermal & fixed magnetic releases) upto 250A & beyond microprocessor based releases with KWH meter with RS-485 Port With ON/ Off/ trip indication lamps.						
		TVSS:						
		Supply, installation, testing & commissioning of 36 kA surge handling capacity TVSS with 10 mode protection including EMI & RFI filters and with inbuilt back up fuse protection, with 4P MCB of 50 kA breaking capacity and complete with wiring as required.						
		All UPS & UPS output panels to have a raw body earth bus & a dedicated earth bus on insulated supports.						
		Protections, Indication & metering as per general notes & specification of panel & switch boards						
		Surge Protection device to be earthed suitably as per manufacturers recommendation.						
		Vendor to ensure selection of MCCB & MCB through cascading effect to mitigate the prospective fault circuit current.						
		UPS OUTPUT PANEL OFFICE/ IT+LABS as described above.	1	SET		224,383	-	224,383
6.3	MR	UPS INPUT PANEL -OT's/ ICU's/ NICU's/ Emergency Beds : (FOR IPD)						
		IP Rating : IP 42						
		Incomer:						
		1 No., 1000 A, 50 kA, 4P, EDO, ACB with:						
i.		230V, AC spring charging motor						

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
ii.		230V, AC closing coil						
iii.		24V, DC shunt trip coil						
iv.		4 NO + 4NC Aux. contacts						
v.		In built trip LED's						
vi.		Breaker control switch						
		Protection:						
i.		In built micro processor based releases (O/C, S/C & E/F).						
ii.		Restricted earth fault relay with 4 Nos. PS class cast resin CT's of suitable burden & ratio (1 No. at transformer & 3 Nos. at ACB incomer)						
		Metering & Indications						
i.		R, Y, B LED indications (110V)						
ii.		ON, OFF, TRIP LED indications (24V DC)						
iii.		Trip circuit healthy indications (24V DC)						
iv.		415V/√3/110V/√3 PT's, Cast Resin type, 3 Phase for metering & indications, suitable rated 6A, TP MPCB of the fault withstand capacity as of the panel on the primary side of PT & suitable rated 6A, TP MCB on the secondary side of PT. This metering PT shall be of Class-1 accuracy.						
v.		3 Nos. cast resin class 1 metering CT's of adequate burden & ratio.						
vi.		MFM meter (with RS 485 port) with following parameter: A,V, PF, Hz, KW, KWH, KVA, KVAR, KVARH. (110V AC).						
vii.		3 Nos. Cast resin Class 1 CT's of adequate burden & ratio for automatic power factor capacitor relay.						
		Bus bars						
		1200 A, TPN, Aluminium Bus bars of Electrolytic grade with heat shrinkable sleeves 50KA.						
		Outgoings :						
		5 No. 630A, 50 KA, FP MCCB (fixed thermal & fixed magnetic releases) upto 250A & beyond microprocessor based releases with KWH meter with RS-485 Port With ON/ Off/ trip indication lamps.						
		TVSS:						
		Supply, installation, testing & commissioning of 36 kA surge handling capacity TVSS with 10 mode protection including EMI & RFI filters and with inbuilt back up fuse protection, with 4P MCB of 50 kA breaking capacity and complete with wiring as required.						
		All UPS & UPS output panels to have a raw body earth bus & a dedicated earth bus on insulated supports.						
		Protections, Indication & metering as per general notes & specification of panel & switch boards						
		Surge Protection device to be earthed suitably as per manufacturers recommendation.						

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
		Vendor to ensure selection of MCCB & MCB through cascading effect to mitigate the prospective fault circuit current.						
		UPS INPUT PANEL -OT's/ICU's/NICU's/Emergency Beds as described above.	1	SET		482,163	-	482,163
6.4	MR	UPS OUTPUT PANEL OT's/ICU's/NICU's/Emergency Beds : (FOR IPD)						
		IP Rating : IP 42						
		Incomer						
		3 No. 630 A 35 KA, TP MCCB and neutral isolation link 200% (fixed Thermal & fixed Magnetic releases) upto 250A, thermal-magnetic releases OR Micro-Processor based releases beyond 250A. MCCB shall have 1NO + 1NC auxiliary contacts + a trip contact.						
		Incomer Metering & Indication for each incomer:						
		415V/√3/110V/√3 PT's, Cast Resin type, 3 Phase for metering & indications, suitable rated 6A, TP MPCB of the fault withstand capacity as of the panel on the primary side of PT & suitable rated 6A, TP MCB on the secondary side of PT. This metering PT shall be of Class-1 accuracy.						
		R,Y,B phase indication lamps (110V) LED Type						
		ON' & Trip indication lamps (110V) LED Type						
		Cast resin metering CT's for each phase of class-1 accuracy & of suitable burden & ratio						
		1 No. Digital Multifunction meter (110V) (With RS 485 Port)						
		Bus bars						
		1200 A, 4P AL, Bus bars of Electrolytic grade with heat shrinkable sleeves 35 KA.						
		Outgoings:						
		4 No. 800 35 KA, TP+2N MCCB (fixed thermal & fixed magnetic releases), upto 250A & beyond microprocessor based releases with KWH meter with RS-485 Port With ON/Off/trip indication lamps.						
		TVSS:						
		Supply, installation, testing & commissioning of 36 kA surge handling capacity TVSS with 10 mode protection including EMI & RFI filters and with inbuilt back up fuse protection, with 4P MCB of 50 KA breaking capacity and complete with wiring as required.						
		All UPS & UPS output panels to have a raw body earth bus & a dedicated earth bus on insulated supports.						
		Protections, Indication & metering as per general notes & specification of panel & switch boards						
		Surge Protection device to be earthed suitably as per manufacturers recommendation.						
		Vendor to ensure selection of MCCB & MCB through cascading effect to mitigate the prospective fault circuit current.						
		UPS OUTPUT PANEL OT's/ICU's/NICU's/Emergency Beds as described above.	1	SET		363,755	-	363,755

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
6.5	MR	UPS INPUT PANEL (MEDICAL LAB) :						
		IP Rating : IP 42						
		Incomer						
		1No. 315A 35KA, FP, MCCB (fixed Thermal & fixed Magnetic releases) upto 250A, thermal-magnetic releases OR Micro-Processor based releases beyond 250A. MCCB shall have 1NO + 1NC auxiliary contacts + a trip contact.						
		Incomer Metering & Indication:						
		415V / $\sqrt{3}$ / 110V/ $\sqrt{3}$ PT's, Cast Resin type, 3 Phase for metering & indications, suitable rated 6A, TP MPCB of the fault withstand capacity as of the panel on the primary side of PT & suitable rated 6A, TP MCB on the secondary side of PT. This metering PT shall be of Class-1 accuracy.						
		R,Y,B phase indication lamps (110V) LED Type						
		ON' & Trip indication lamps (110V) LED Type						
		Cast resin metering CT's for each phase of class-1 accuracy & of suitable burden & ratio						
		1 No. Digital VAF + PF Meter (110V) (With RS 485 Port)						
		Bus bars						
		400 A, TPN, Aluminium Bus bars of Electrolytic grade with heat shrinkable sleeves 35KA.						
		Outgoings :						
		3 Nos. 315 A, 35 KA, FP MCCB (fixed thermal & fixed magnetic releases) upto 250A & beyond microprocessor based releases with KWH meter with RS-485 Port With ON/Off/trip indication lamps.						
		3Nos.40 Amp,DP,10kA MCBs						
		TVSS:						
		Supply, installation, testing & commissioning of 36 kA surge handling capacity TVSS with 10 mode protection including EMI & RFI filters and with inbuilt back up fuse protection, with 4P MCB of 50 kA breaking capacity and complete with wiring as required.						
		All UPS & UPS output panels to have a raw body earth bus & a dedicated earth bus on insulated supports.						
		Protections, Indication & metering as per general notes & specification of panel & switch boards						
		Protections, Indication & metering as per general notes & specification of panel & switch boards						

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
		Vendor to ensure selection of MCCB & MCB through cascading effect to mitigate the prospective fault circuit current.						
		UPS INPUT PANEL(MEDICAL LAB) as described above.	1	SET		244,624	-	244,624
6.6	MR	UPS OUTPUT PANEL (MEDICAL LAB) :						
		IP Rating : IP 42						
		Incomer						
		2 Nos. 315A 35 KA, TP+2N MCCB and neutral isolation link 200% (fixed Thermal & fixed Magnetic releases) upto 250A, thermal-magnetic releases OR Micro-Processor based releases beyond 250A. MCCB shall have 1NO + 1NC auxiliary contacts + a trip contact.						
		Incomer Metering & Indication for each incomer:						
		415V/ √3/ 110V/ √3 PT's, Cast Resin type, 3 Phase for metering & indications, suitable rated 6A, TP MPCB of the fault withstand capacity as of the panel on the primary side of PT & suitable rated 6A, TP MCB on the secondary side of PT. This metering PT shall be of Class-1 accuracy.						
		R,Y,B phase indication lamps (110V) LED Type						
		ON' & Trip indication lamps (110V) LED Type						
		Cast resin metering CT's for each phase of class-1 accuracy & of suitable burden & ratio						
		1 No. Digital Multifunction meter (110V) (With RS 485 Port)						
		Bus bars						
		400 A, 4P AL, Bus bars of Electrolytic grade with heat shrinkable sleeves 35 KA.						
		Outgoings:						
		10Nos.63 Amp,4P,10kA MCBs						
		TVSS:						
		Supply, installation, testing & commissioning of 36 kA surge handling capacity TVSS with 10 mode protection including EMI & RFI filters and with inbuilt back up fuse protection, with 4P MCB of 50 kA breaking capacity and complete with wiring as required.						
		All UPS & UPS output panels to have a raw body earth bus & a dedicated earth bus on insulated supports.						
		Protections, Indication & metering as per general notes & specification of panel & switch boards						
		Surge Protection device to be earthed suitably as per manufacturers recommendation.						
		Vendor to ensure selection of MCCB & MCB through cascading effect to mitigate the prospective fault circuit current.						
		UPS OUTPUT PANEL (MEDICAL LAB) as described above.	1	SET		244,624	-	244,624

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
6.7	MR	MAIN LT PANEL-IPD (TTA PANEL)						
		IP Rating : IP 42 Double Door						
		Incomer-1 : Transformer (2500 kVA)						
		1 No., 5000 A, 65 kA, 4P, EDO, ACB with:						
i.		230V, AC spring charging motor						
ii.		230V, AC closing coil						
iii.		24V, DC shunt trip coil						
iv.		4 NO + 4NC Aux. contacts						
v.		In built trip LED's						
vi.		Breaker control switch						
		Protection:						
i.		In built micro processor based releases (O/C, S/C & E/F).						
ii.		Restricted earth fault relay with 4 Nos. PS class cast resin CT's of suitable burden & ratio (1 No. at transformer & 3 Nos. at ACB incomer)						
iii.		Differential Protection Relay						
		Metering & Indications						
i.		R, Y, B LED indications (110V)						
ii.		ON, OFF, TRIP LED indications (24V DC)						
iii.		Trip circuit healthy indications (24V DC)						
iv.		415V / $\sqrt{3}$ / 110V/ $\sqrt{3}$ PT's, Cast Resin type, 3 Phase for metering & indications, suitable rated 6A, TP MPCB of the fault withstand capacity as of the panel on the primary side of PT & suitable rated 6A, TP MCB on the secondary side of PT. This metering PT shall be of Class-1 accuracy.						
v.		3 Nos. cast resin class 1 metering CT's of adequate burden & ratio.						
vi.		MFM meter (with RS 485 port) with following parameter: A,V, PF, Hz, KW, KWH, KVA, KVAR, KVARH. (110V AC).						
vii.		One set of dual core ratio CT of 5000/2500/5/5A for Capacitor Panel.						
viii.		One set of CT suitable for AHF-class of accuracy should be 0.5, burden 15VA, secondary ratio 5000/1 Amp (for Active Hermonic filter).						
		Bus Bars:						
		5000 A, TPN, Copper Bus bars of Electrolytic grade with heat shrinkable sleeves 65 KA. Bus bar rated for 50 deg. C temp. rise over the ambient temperature of 40 deg. C (for all indoor panels)						
		Out goings on section-1:						
		1 No. 2000 A 65 kA, 3P EDO ACB (with lockable push button) with 4NO + 4NC Auxiliary contacts, with inbuilt Micro Processor based releases (O/C, S/C, E/F), inbuilt trip LED, 3 Nos. Class-1 dual switch, dual ratio CT with day/ night time switch of suitable ratio & burden & digital ammeter with inbuilt selector switch, ON/OFF LED indications (24V DC) for 850 KVAR Capacitor Panel/ Bank.						
		Feeders for Active Harmonic Filter						
		2 Nos. 630A, 65 KA, 3P Microprocessor based MCCB						

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
		4 Nos. 3200 A 65 kA, 4P EDO ACB with 4NO + 4NC Auxiliary contacts, with inbuilt Micro Processor based releases (O/C, S/C, E/F), inbuilt trip LED, 3 Nos. Class-1 Cast Resin metering CT's of suitable ratio & burden, ON/OFF LED indications (24V DC).						
		For Each :						
		1 No. Digital Multi Function Meter (110V) (With RS 485 Port) with following parameters: A, V, PF, Hz, KW, KWH, KVA, KVAH, KVAR, KVARH						
		Bus Coupler - 1:						
		Between Section 1 & 2nd Incomer:						
		1 No. 5000 A, 65 KA, 4P, EDO ACB with:						
	i.	230V AC spring charging motor						
	ii.	230V AC closing coil						
	iii.	24V, DC shunt trip coil						
	iv.	4NO + 4NC Aux. contacts						
		Indications						
		ON, OFF LED indications (24V DC)						
		Incomer-2 : Transformer (2500 kVA)						
		1 No., 5000 A, 65 kA, 4P, EDO, ACB with:						
	i.	230V, AC spring charging motor						
	ii.	230V, AC closing coil						
	iii.	24V, DC shunt trip coil						
	iv.	4 NO + 4NC Aux. contacts						
	v.	In built trip LED's						
	vi.	Breaker control switch						
		Protection:						
	i.	In built micro processor based releases (O/C, S/C & E/F).						
	ii.	Restricted earth fault relay with 4 Nos. PS class cast resin CT's of suitable burden & ratio (1 No. at transformer & 3 Nos. at ACB incomer)						
		Metering & Indications						
	i.	R, Y, B LED indications (110V)						
	ii.	ON, OFF, TRIP LED indications (24V DC)						
	iii.	Trip circuit healthy indications (24V DC)						
	iv.	415V/ $\sqrt{3}$ / 110V/ $\sqrt{3}$ PT's, Cast Resin type, 3 Phase for metering & indications, suitable rated 6A, TP MPCB of the fault withstand capacity as of the panel on the primary side of PT & suitable rated 6A, TP MCB on the secondary side of PT. This metering PT shall be of Class-1 accuracy.						
	v.	3 Nos. cast resin class 1 metering CT's of adequate burden & ratio.						
	vi.	MFM meter (with RS 485 port) with following parameter: A, V, PF, Hz, KW, KWH, KVA, KVAR, KVARH. (110V AC).						

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
vii.		One set of dual core ratio CT of 5000/2500/5/5A for Capacitor Panel.						
viii.		One set of CT suitable for AHF-class of accuracy should be 0.5, burden 15VA, secondary ratio 5000/1 Amp (for Active Hermonic filter).						
		Bus Coupler - 2:						
		Between Section 2 & 2nd Incomer:						
		1 No. 5000 A, 65 KA, 4P, EDO ACB with:						
i.		230V AC spring charging motor						
ii.		230V AC closing coil						
iii.		24V, DC shunt trip coil						
iv.		4NO + 4NC Aux. contacts						
		Indications						
		ON, OFF LED indications (24V DC)						
		Bus Bars (section 2 & 3):						
		5000 A, 4P, Copper Bus bars of Electrolytic grade with heat shrinkable sleeves 65 KA. Bus bar rated for 50 deg. C temp. rise over the ambient temperature of 40 deg. C (for all indoor panels)						
		Out goings on section-2:						
		1 No. 2000 A 65 KA, 3P EDO ACB (with lockable push button) with 4NO + 4NC Auxiliary contacts, with inbuilt <u>Micro Processor based releases</u> (O/C, S/C, E/F), inbuilt trip LED, 3 Nos. Class-1 dual switch, dual ratio CT with day/ night time switch of suitable ratio & burden & digital ammeter with inbuilt selector switch, ON/ OFF LED indications (24V DC) for 850 KVAR Capacitor Panel/ Bank.						
		Feeders for Active Harmonic Filter						
		2 Nos. 630A, 65 KA, 3P Microprocessor based MCCB						
		3 Nos. 3200 A 65 KA, 4P EDO ACB with 4NO + 4NC Auxiliary contacts, with <u>inbuilt Micro Processor based releases</u> (O/C, S/C, E/F), inbuilt trip LED, 3 Nos. Class-1 Cast Resin metering CT's of suitable ratio & burden, ON/ OFF LED indications (24V DC).						
		For Each :						
		1 No. Digital Multi Function Meter (110V) (With RS 485 Port) with following parameters:						
		Bus Coupler - 3:						
		Between Section 2 & 3rd Incomer:						
		1 No. 5000 A, 65 KA, 4P, EDO ACB with:						
i.		230V AC spring charging motor						
ii.		230V AC closing coil						
iii.		24V, DC shunt trip coil						
iv.		4NO + 4NC Aux. contacts						
		Indications						
		ON, OFF LED indications (24V DC)						

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
		Incomer-3 : Transformer (2500 kVA)						
		1 No., 5000 A, 65 kA, 4P, EDO, ACB with:						
i.		230V, AC spring charging motor						
ii.		230V, AC closing coil						
iii.		24V, DC shunt trip coil						
iv.		4 NO + 4NC Aux. contacts						
v.		In built trip LED's						
vi.		Breaker control switch						
		Protection:						
i.		In built micro processor based releases (O/C, S/C & E/F).						
ii.		Restricted earth fault relay with 4 Nos. PS class cast resin CT's of suitable burden & ratio (1 No. at transformer & 3 Nos. at ACB incomer)						
		Metering & Indications						
i.		R, Y, B LED indications (110V)						
ii.		ON, OFF, TRIP LED indications (24V DC)						
iii.		Trip circuit healthy indications (24V DC)						
iv.		415V/√3/ 110V/√3 PT's, Cast Resin type, 3 Phase for metering & indications, suitable rated 6A, TP MPCB of the fault withstand capacity as of the panel on the primary side of PT & suitable rated 6A, TP MCB on the secondary side of PT. This metering PT shall be of Class-1 accuracy.						
v.		3 Nos. cast resin class 1 metering CT's of adequate burden & ratio.						
vi.		MFM meter (with RS 485 port) with following parameter: A,V, PF, Hz, KW, KWH, KVA, KVAR, KVARH. (110V AC).						
vii.		One set of dual core ratio CT of 5000/2500/5/5A for Capacitor Panel.						
viii.		One set of CT suitable for AHF-class of accuracy should be 0.5, burden 15VA, secondary ratio 5000/1 Amp (for Active Hermonic filter).						
		Bus Coupler - 4:						
		Between Section 3 & 3rd Incomer:						
		1 No. 5000 A, 65 KA, 4P, EDO ACB with:						
i.		230V AC spring charging motor						
ii.		230V AC closing coil						
iii.		24V, DC shunt trip coil						
iv.		4NO + 4NC Aux. contacts						
		Indications						
		ON, OFF LED indications (24V DC)						
		Bus Bars (section 4 & 5):						
		5000 A, 4P, Copper Bus bars of Electrolytic grade with heat shrinkable sleeves 65 KA. Bus bar rated for 50 deg. C temp. rise over the ambient temperature of 40 deg. C (for all indoor panels)						

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
		Out goings on section-3:						
		1 No. 2000 A 65 kA, 3P EDO ACB (with lockable push button) with 4NO + 4NC Auxiliary contacts, with inbuilt Micro Processor based releases (O/C, S/C, E/F), inbuilt trip LED, 3 Nos. Class-1 dual switch, dual ratio CT with day/ night time switch of suitable ratio & burden & digital ammeter with inbuilt selector switch, ON/ OFF LED indications (24V DC) for 850 KVAR Capacitor Panel/ Bank.						
		Feeders for Active Harmonic Filter						
		1 No. 630A, 65 KA, 3P Microprocessor based MCCB						
		2 Nos. 2000 A 65 kA, 4P EDO ACB with 4NO + 4NC Auxiliary contacts, with inbuilt Micro Processor based releases (O/C, S/C, E/F), inbuilt trip LED, 3 Nos. Class-1 Cast Resin metering CT's of suitable ratio & burden, ON/ OFF LED indications (24V DC).						
		For each:						
		1 No. Digital Multi Function Meter (110V) (With RS 485 Port) with following parameters:						
		A,V, PF, Hz, KW, KWH, KVA, KVAH, KVAR, KVARH						
		2 Nos. 3200 A 65 kA, 4P EDO ACB with 4NO + 4NC Auxiliary contacts, with inbuilt Micro Processor based releases (O/C, S/C, E/F), inbuilt trip LED, 3 Nos. Class-1 Cast Resin metering CT's of suitable ratio & burden, ON/ OFF LED indications (24V DC).						
		For each:						
		1 No. Digital Multi Function Meter (110V) (With RS 485 Port) with following parameters:						
		A,V, PF, Hz, KW, KWH, KVA, KVAH, KVAR, KVARH						
		Bus Coupler - 5:						
		Between Section 3 & 4th Incomer:						
		1 No. 5000 A, 65 KA, 4P, EDO ACB with:						
	i.	230V AC spring charging motor						
	ii.	230V AC closing coil						
	iii.	24V, DC shunt trip coil						
	iv.	4NO + 4NC Aux. contacts						
		Indications						
		ON, OFF LED indications (24V DC)						
		Bus Bars:						
		5000 A, 4P, Copper Bus bars of Electrolytic grade with heat shrinkable sleeves 65 KA. Bus bar rated for 50 deg. C temp. rise over the ambient temperature of 40 deg. C (for all indoor panels)						
		Incomer-4 : Transformer (2500 kVA)						
		1 No., 5000 A, 65 kA, 4P, EDO, ACB with:						
	i.	230V, AC spring charging motor						
	ii.	230V, AC closing coil						
	iii.	24V, DC shunt trip coil						

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
iv.		4 NO + 4NC Aux. contacts						
v.		In built trip LED's						
vi.		Breaker control switch						
		Protection:						
i.		In built micro processor based releases (O/C, S/C & E/F).						
ii.		Restricted earth fault relay with 4 Nos. PS class cast resin CT's of suitable burden & ratio (1 No. at transformer & 3 Nos. at ACB incomer)						
		Metering & Indications						
i.		R, Y, B LED indications (110V)						
ii.		ON, OFF, TRIP LED indications (24V DC)						
iii.		Trip circuit healthy indications (24V DC)						
iv.		415V/√3/ 110V/√3 PT's, Cast Resin type, 3 Phase for metering & indications, suitable rated 6A, TP MPCB of the fault withstand capacity as of the panel on the primary side of PT & suitable rated 6A, TP MCB on the secondary side of PT. This metering PT shall be of Class-1 accuracy.						
v.		3 Nos. cast resin class 1 metering CT's of adequate burden & ratio.						
vi.		MFM meter (with RS 485 port) with following parameter: A.V, PF, Hz, KW, KWH, KVA, KVAR, KVARH. (110V AC).						
vii.		One set of dual core ratio CT of 5000/2500/5/5A for Capacitor Panel.						
viii.		One set of CT suitable for AHF-class of accuracy should be 0.5, burden 15VA, secondary ratio 5000/1 Amp (for Active Hermonic filter).						
		Bus Coupler - 6:						
		Between Section 4 & 4th Incomer:						
		1 No. 5000 A, 65 KA, 4P, EDO ACB with:						
i.		230V AC spring charging motor						
ii.		230V AC closing coil						
iii.		24V, DC shunt trip coil						
iv.		4NO + 4NC Aux. contacts						
		Indications						
		ON, OFF LED indications (24V DC)						
		Incomer-5 : Transformer (2500 kVA)						
		1 No., 5000 A, 65 kA, 4P, EDO, ACB with:						
i.		230V, AC spring charging motor						
ii.		230V, AC closing coil						
iii.		24V, DC shunt trip coil						
iv.		4 NO + 4NC Aux. contacts						
v.		In built trip LED's						
vi.		Breaker control switch						
		Protection:						
i.		In built micro processor based releases (O/C, S/C & E/F).						

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
ii.		Restricted earth fault relay with 4 Nos. PS class cast resin CT's of suitable burden & ratio (1 No. at transformer & 3 Nos. at ACB incomer)						
		Metering & Indications						
i.		R, Y, B LED indications (110V)						
ii.		ON, OFF, TRIP LED indications (24V DC)						
iii.		Trip circuit healthy indications (24V DC)						
iv.		415V/√3/ 110V/√3 PT's, Cast Resin type, 3 Phase for metering & indications, suitable rated 6A, TP MPCB of the fault withstand capacity as of the panel on the primary side of PT & suitable rated 6A, TP MCB on the secondary side of PT. <u>This metering PT shall be of Class-1 accuracy.</u>						
v.		3 Nos. cast resin class 1 metering CT's of adequate burden & ratio.						
vi.		MFM meter (with RS 485 port) with following parameter: A,V, PF, Hz, KW, KWH, KVA, KVAR, KVARH. (110V AC).						
vii.		One set of dual core ratio CT of 5000/2500/5/5A for Capacitor Panel.						
viii.		One set of CT suitable for AHF-class of accuracy should be 0.5, burden 15VA, secondary ratio 5000/1 Amp (for Active Hermonic filter).						
		Bus Bars (Section 4):						
		5000 A, 4P, Copper Bus bars of Electrolytic grade with heat shrinkable sleeves 65 KA. Bus bar rated for 50 deg. C temp. rise over the ambient temperature of 40 deg. C (for all indoor panels)						
		Out goings on section-4:						
		1 No. 2000 A 65 kA, 3P <u>EDO ACB</u> (with lockable push button) with 4NO + 4NC Auxiliary contacts, with inbuilt <u>Micro Processor based releases</u> (O/C, S/C, E/F), inbuilt trip LED, 3 Nos. Class-1 dual switch, dual ratio CT with day/ night time switch of suitable ratio & burden & digital ammeter with inbuilt selector swtich, ON/ OFF LED indications (24V DC) for 850 KVAR Capacitor Panel/ Bank.						
		Feeders for Active Harmonic Filter						
		1 No. 630A, 65 KA, 3P Microprocessor based MCCB						
		2 Nos. 3200 A 65 kA, 4P <u>EDO ACB</u> with 4NO + 4NC Auxiliary contacts, with <u>inbuilt Micro Processor based releases</u> (O/C, S/C, E/F), inbuilt trip LED, 3 Nos. Class-1 Cast Resin metering CT's of suitable ratio & burden, ON/OFF LED indications (24V DC).						
		For Each:						
		1 No. Digital Multi Function Meter (110V) (With RS 485 Port) with following parameters:						
		A,V, PF, Hz, KW, KWH, KVA, KVAH, KVAR, KVARH						
		2 Nos. 2000 A 65 kA, 4P <u>EDO ACB</u> with 4NO + 4NC Auxiliary contacts, with <u>inbuilt Micro Processor based releases</u> (O/C, S/C, E/F), inbuilt trip LED, 3 Nos. Class-1 Cast Resin metering CT's of suitable ratio & burden, ON/OFF LED indications (24V DC).						
		For Each:						
		1 No. Digital Multi Function Meter (110V) (With RS 485 Port) with following parameters:						
		A,V, PF, Hz, KW, KWH, KVA, KVAH, KVAR, KVARH						

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
		2 Nos. 800 A, 65 KA, FP MCCB (with fixed thermal & fixed magnetic releases) upto 250A & beyond microprocessor based releases) with KWH meter with RS-485 Port With ON/Off/trip indication lamps.						
		2 Nos. 400 A, 65 KA, 4P MCCB (with fixed thermal & fixed magnetic releases) upto 250A & beyond microprocessor based releases) with KWH meter with RS-485 Port With ON/Off/trip indication lamps.						
		2 Nos. 200 A, 65 KA, 4P MCCB (with fixed thermal & fixed magnetic releases) upto 250A & beyond microprocessor based releases) with KWH meter with RS-485 Port With ON/Off/trip indication lamps.						
		3 Nos. 100 A, 65 KA, 4P MCCB (with fixed thermal & fixed magnetic releases) upto 250A & beyond microprocessor based releases) with KWH meter with RS-485 Port With ON/Off/trip indication lamps.						
		PLC						
		1 No. BMS compatible PLC with MMI (man machine interface) to manage the electrical interlocking between incoming breakers & Bus couplers.						
		UPS						
		1 No. suitable capacity UPS.						
		MAIN LT PANEL -SUBSTATION (TTA PANEL) as described above	1	Set		16,078,015	-	16,078,015
6.8		Automatic Power Factor Correction Panel 850KVAR						
		Design, manufacture, assembly, wiring, testing at works and supply to site, installation, testing & commissioning at site, complete in all respect:						
		IP Rating: IP 54						
		Incomer :						
		1 No. 1600A 50KA, TPN, EDO, ACB with 4 NO + 4 NC Auxiliary contacts and with inbuilt Micro Processor based releases (O/C, S/C, E/F) & inbuilt Trip LED.						
		Indications & PT's						
		400V/ $\sqrt{3}$ / 110V/ $\sqrt{3}$ PT's, Cast Resin type, 3 Phase for metering & indications, suitable rated 32A, TP bus mounted fuse with 6A TP MCB on the primary side of PT & suitable rated 6A, TP MCB on the secondary side of PT. This metering PT shall be of Class-1 accuracy.						
		R,Y,B phase indication lamps (110V) LED Type						
		ON,OFF indication lamps (110V) LED Type						
		Bus bars:						
		1800A, 3P+N/L, Aluminium Bus Bars of Electrolytic grade with heat shrinkable sleeves 50KA.						
		Automatic PF correction relay - Micro processor based, BMS Compatible:						
		3 Phase Intelligent Power factor correction relay with inbuilt metering features like:						
		14 Steps Relay						

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
		Total Current						
		Voltage						
		Power Factor						
		Current of each bank						
		Dual source settings						
		Dielectric lossess shall less than or equal to 0.2W/ Watt/ KVAR						
		1 No. Off delay timer for manual operation						
		850KVAR Capacitor bank, MPP (Heavy duty) with 14% detuned reactor.						
		Control Transformer & Control Circuiting for Contactors & Indication Lamps :						
		1 No. 400V/ 55-0-55V Cast resin Dry type control transformer of adequate 'VA' burden to take care of load of all the contactor coils.						
		Suitable rated 6A, DP, MPCB of the fault withstand capacity as of the panel for control circuiting for contactors coils on the primary side of control transformer & suitable rated 6A, DP MCB on the secondary side of control transformer. (Transformer with primary taps at $\pm 2.5\%$, $\pm 5\%$, 50 Hz, centre tap earthed).						
		110V Control circuiting						
		110V Control supply healthy indication (LED Type).						
		Outgoings:						
		5 Nos. 100 KVAR Sets, each comprising :						
		1 No. 250A,TP, MCCB of capacitor duty 35KA for 100KVAR Bank alongwith:						
		3P capacitor duty contactor with 2 NO + 2 NC auxilliary contacts for 100KVAR capacitor						
		A/M Selector switch						
		Illuminated ON/OFF Push buttons						
		100KVAR Capacitor bank, MPP (Super Heavy duty) with 14% detuned reactor.						
		6 Nos. 50 KVAR Sets, each comprising :						
		1 No. 125A,TP, MCCB of capacitor duty 35KA for 50KVAR Bank alongwith:						
		3P capacitor duty contactor with 2 NO + 2 NC auxilliary contacts for 50KVAR capacitor						
		A/M Selector switch						
		Illuminated ON/OFF Push buttons						
		50KVAR Capacitor bank, MPP (Super Heavy duty) with 14% detuned reactor.						
		2 Nos. 25 KVAR Sets, each comprising :						
		1 No. 63A,TP, MCCB of capacitor duty 35KA for 50KVAR Bank alongwith:						
		3P capacitor duty contactor with 2 NO + 2 NC auxilliary contacts for 25KVAR capacitor						
		A/M Selector switch						
		Illuminated ON/OFF Push buttons						
		25KVAR Capacitor bank, MPP (Super Heavy duty) with 14% detuned reactor.						
		In case of capacitor banks with de-tuned reactor, the operating voltage for capacitors shall be 480V minimum.						
		Automatic Power Factor Correction Panel 850KVAR as described above.	4	Set		1,799,778	-	7,199,112

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
6.9		ACTIVE HARMONIC FILTER (AHF) 300Amps at 440V						
		Supply, installation, testing, supply and commissioning of LV cubicle type totally enclosed free standing type, powder coated, dust, damp and vermin proof Active harmonic filter of 3-phase/ 3-wire, 440V, 300A IGBT based AHF with 300 Amp module. It should eliminate the harmonic up to the 51th order and should have 3 level topology with IP 20 encloser. AHF shall have low losses (less then or equal 21W/ Amp) and As per technical Specifications required						
	a)	INCOMER:						
		630A, 415 Volts, MCCB, 50 KA, Four Pole, with microprocessor based overload, Ics = 100% Icu as per IEC 60947-2, short circuit & Instantaneous Earth fault trip, Embedded Energy metering and communication capable, Power Quality Indicator (Total Harmonic Distortion for Current and Voltage)						
		Indicating lamps with 6A protection MCBs to indicate OPEN, CLOSE, TRIP.						
		R, Y & B Phase indicating lamps (LED type) with 6A control SP MCBs.						
		Extension of incoming busbars for connection of multicore armoured aluminium cables.						
		CT Position Closed Loop Control: Source sense (at mains) CT or Load sense CT, Automatic C.T.detection & calibration from AHF						
	b)	METERING:						
		1 set of Multifunction meter display Current, Power factor and Voltage with RS 485 Port.						
	c)	BUSBARS:						
		630 Amps TPN busbars of aluminum with temperture rise of 40 degree celsius over and above Ambient temperture of 45 degree celsius.						
	d)	OUTGOINGS:						
	i)	4Nos.60 Amp at 440V IGBT based Module step as per following details/ specification:						
		60 Amp module with 12 IGBTs, 3 level topology .						
		Internal fuse suitable for 60Amp module.						
		"ON" and "OFF" LED indicating lamp ON Modules						
	ii)	1Nos.60 Amp at 440V IGBT based Module step as per following details/ specification:						
		60 Amp module with 12 IGBTs, 3 level topology in future.						
		AHF PANEL as mentioned above	4	Set		719,911	-	2,879,644
		Note:-						
		The AHF should be with compatible with Grid Power OR D.G. Power Supply.						
		Total Carried to Summary					-	27,920,896

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
7		MV CABLES, CABLE JOINTING & END TERMINATIONS						
7.1	7.1	Laying of one number PVC insulated and PVC sheathed/ XLPE power cable of 1.1 kV grade of following size direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc. as required.						
7.1.1	7.1.2	Above 35 sq. mm and upto 95 sq. mm	10	meter	214		2,140	-
7.2	7.2	Laying of one number additional PVC insulated and PVC sheathed/ XLPE power cable of 1.1 kV grade of following size direct in ground in the same trench in one tier horizontal formation including excavation, sand cushioning, protective covering and refilling the trench etc. as required.						
7.2.1	7.2.2	Above 35 sq. mm and upto 95 sq. mm	1000	meter	149		149,000	-
7.2.2	7.2.3	Above 95 sq. mm and upto 185 sq. mm	1500	meter	158		237,000	-
7.2.3	7.2.4	Above 185 sq. mm and upto 400 sq. mm	750	meter	183		137,250	-
7.3	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.						
7.3.1	7.8.1	Upto 35 sq. mm (clamped with 1mm thick saddle)	10	Metre	21		210	-
7.4	9.1	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed/ XLPE aluminium conductor cable of 1.1 kV grade as required.						
7.4.1	9.1.30	3.5 C x 300 Sqmm	8	Each	1106		8,848	-
7.4.2	9.1.27	3.5 C x 185 Sqmm	12	Each	804		9,648	-
7.4.3	9.1.26	3.5 C x 150 Sqmm	2	Each	592		1,184	-
7.4.4	9.1.25	3.5 C x 120 Sqmm	4	Each	500		2,000	-
7.4.5	9.1.24	3.5 C x 95 Sqmm	2	Each	482		964	-
7.4.6	9.1.11	3C x 50 Sqmm	12	Each	286		3,432	-
7.5	MR	Supply, loading, transportation unloading at site, storages at site, shifting from storage place to site of following sizes of 1.1kV grade XLPE insulated, Extruded PVC inner sheathed & overall FR-LSH PVC outer sheathed, Aluminium conductor, Armoured cables as per IS:7098 Part-I or amended upto date and as per specifications.						
7.4.1	MR	3.5 C x 300 Sqmm	750	Metre		1,225	-	918,750
7.4.2	MR	3.5 C x 185 Sqmm	1200	Metre		953	-	1,143,600
7.4.3	MR	3.5 C x 150 Sqmm	15	Metre		736	-	11,040
7.4.4	MR	3.5 C x 120 Sqmm	400	Metre		647	-	258,800
7.4.5	MR	3.5 C x 95 Sqmm	10	Metre		497	-	4,970
7.4.6	MR	3C x 50 Sqmm	1000	Metre		280	-	280,000
		Total Carried to Summary					551,676	2,617,160

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
8		CABLE TRAYS						
		Hot Dipped Galvanized Iron Cable Tray						
8.1	4.7	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.						
8.1.1	4.7.2	150 mm width X 50 mm depth X 1.6 mm thickness	100	Meter	976		97,600	-
8.1.2	4.7.6	450 mm width X 50 mm depth X 2.0 mm thickness	100	Meter	2184		218,400	-
8.2	4.8	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.						
8.2.1	4.8.2	150 mm width X 50 mm depth X 1.6 mm thickness	15	Each	976		14,640	-
8.2.2	4.8.6	450 mm width X 50 mm depth X 2.0 mm thickness	15	Each	2576		38,640	-
8.3	MR	LADDER TYPE CABLE TRAY						
		Supply, fabrication and installation of pre-galvanised factory built G.I ladder type cable trays complete with all bends, tees, elbows, reducers, supports & fixing arrangement etc. of various widths in single tier/ two tier/ three tier/ five tier fashion either on one side of the wall or on two sides of the wall or at ceiling/ wall/ floor. (All bends & tee shall be of factory built of same make as that of tray). Cable tray supports are supposed to be included in the rate of the trays. Nothing extra to be paid for cable tray supports. Cable trays and supports shall be as per specifications.						
8.3.1	MR	750mm wide tray	500	RM		810	-	405,000

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
8.3.2	MR	1000mm wide tray	100	RM		895	-	89,500
8.3.3	MR	1500mm wide tray	200	RM		1,064	-	212,800
8.4	MR	Providing and fixing of MS slotted angle "C" channel/ ladder type rack/ ytray including fixing material grouted in the wall or hanging with MS rod hanger from ceiling including 2 coat synthetic enamel painting over 1 coat of resoxide primer etc. as required.	200	KG		159.00	-	31,800
Note		Contractor to ensure that cable trays and their supports are strong enough to take care of the loads of the cables without sagging and the supporting arrangement shall be safe enough to withstand earthquake situations as per seismic conditions prevailing at site. Contractor to improve upon specifications of trays and supports as specified in the specifications and BOQ, if it is felt necessary for the safety and with the approval of owner/ PMC.						
		Total Carried to Summary					369,280	739,100

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
9		UPS						
9.1	MR	UPS FOR IPD BLOCK (OT's/ ICU's/ NICU's/ Emergency & Dialysis Beds)						
		Supply, installation, testing & commissioning of IGBT based micro processor controlled True On line double conversion 3 phase input and 3 phase 415V output 3 x 250 kVA (0.9PF) Parallel Redundant UPS operating in Parallel redundant configuration (N+1) consisting of following:						
a.		Each UPS module with integrated 100% rectifier + inverter.						
b.		Battery Circuit breaker for Each UPS Module in CRCA housing with all required fixing accerrories & hardware.						
c.		Galvanic Isolation transformer K-13, at the inverter output of Each UPS Module.						
d.		RS 485 BACnet/ Modbus protocol with each UPS module for BMS Connectivity. All the informations to be provided to the BMS vendor at one point.						
e.		In-built Static switch for bypass & inverter in each UPS module.						
f.		In-built Manual Maintenance bypass for each UPS.						
g.		Interconnecting copper cabling (DC cabling) between UPS, Battery breaker & Batteries of required length and size for each UPS.						
h.		Each UPS shall have a SNMP card for LAN/ WEB connectivity. The SNMP card shall have an inbuilt memory for event logging.						
i.		Sealed Maintenance free batteries for 3 X 250 kVA UPS with 30 Mins. backup time on each UPS module with inerconnectors, Rack and accessories. Rack shall have shrouds for safety from live battery terminals.						
j.		Suitable MS stand of 450mm high for each UPS module duly painted for each UPS.						
k.		RAM Module with each UPS and Cat 5 cable for RAM connectivity.						
l.		Charger Capacity 120%						
m.		UPS to have atleast two dry contacts for remote alarms.						
		3X250 kVA UPS described above	1	Set		11,025,857	-	11,025,857
9.2	MR	UPS FOR IPD BLOCK (Offices/IT +Labs)						
		Supply, installation, testing & commissioning of IGBT based micro processor controlled True On line double conversion 3 phase input and 3 phase 415V output 2 X 120 kVA (0.9PF) Parallel Redundant UPS operating in Parallel redundant configuration (N+1) consisting of following:						
a.		Each UPS module with integrated 100% rectifier + inverter.						
b.		Battery Circuit breaker for Each UPS Module in CRCA housing with all required fixing accerrories & hardware.						
c.		Galvanic Isolation transformer K-13, at the inverter output of Each UPS Module.						
d.		RS 485 BACnet / Modbus protocol with each UPS module for BMS Connectivity. All the informations to be provided to the BMS vendor at one point.						
e.		In-built Static switch for bypass & inverter in each UPS module.						
f.		In-built Manual Maintenance bypass for each UPS.						
g.		Interconnecting copper cabling (DC cabling) between UPS, Battery breaker & Batteries of required length and size for each UPS.						
h.		Each UPS shall have a SNMP card for LAN/WEB connectivity. The SNMP card shall have an inbuilt memory for event logging.						

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
i.		Sealed Maintenance free batteries for 2 X 120 kVA UPS with 30 Mins. backup time on each UPS module with inerconnectors, Rack and accessories. Rack shall have shrouds for safety from live battery terminals.						
j.		Suitable MS stand of 450mm high for each UPS module duly painted for each UPS.						
k.		RAM Module with each UPS and Cat 5 cable for RAM connectivity.						
l.		Charger Capacity 120%						
m.		UPS to have atleast two dry contacts for remote alarms.						
		2X120 kVA UPS described above	1	Set		4,330,834	-	4,330,834
9.3	MR	UPS FOR ACADEMIC BLOCK (MEDICAL LAB)						
		Supply, installation, testing & commissioning of IGBT based micro processor controlled True On line double conversion 3 phase input and 3 phase 415V output 2 X 160 kVA (0.9PF) Parallel Redundant UPS operating in Parallel redundant configuration (N+1) consisting of following:						
a.		Each UPS module with integrated 100% rectifier + inverter.						
b.		Battery Circuit breaker for Each UPS Module in CRCA housing with all required fixing accerories & hardware.						
c.		Galvanic Isolation transformer K-13, at the inverter output of Each UPS Module.						
d.		RS 485 BACnet/ Modbus protocol with each UPS module for BMS Connectivity. All the informations to be provided to the BMS vendor at one point.						
e.		In-built Static switch for bypass & inverter in each UPS module.						
f.		In-built Manual Maintenance bypass for each UPS.						
g.		Interconnecting copper cabling (DC cabling) between UPS, Battery breaker & Batteries of required length and size for each UPS.						
h.		Each UPS shall have a SNMP card for LAN/WEB connectivity. The SNMP card shall have an inbuilt memory for event logging.						
i.		Sealed Maintenance free batteries for 2 X 160 kVA UPS with 30 Mins. backup time on each UPS module with inerconnectors, Rack and accessories. Rack shall have shrouds for safety from live battery terminals.						
j.		Suitable MS stand of 450mm high for each UPS module duly painted for each UPS.						
k.		RAM Module with each UPS and Cat 5 cable for RAM connectivity.						
l.		Charger Capacity 120%						
m.		UPS to have atleast two dry contacts for remote alarms.						
		2X160 kVA UPS described above	1	Set		5,715,854	-	5,715,854
		Total Carried to Summary					-	21,072,545

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
10		EARTHING						
10.1	MR	Providing and fixing 32 mm X 6 mm G.I. strip in 40 mm dia G.I. pipe from earth electrode including connection with G.I. nut, bolt, spring, washer excavation and re-filling etc. as required.	1120	meter		595	-	666,400
10.2	5.15	Providing and fixing 25 mm X 5 mm G.I. strip on surface or in recess for connections etc. as required.	1500	meter	129		193,500	-
10.3	5.16	Providing and fixing 6 SWG dia G.I. wire on surface or in recess for loop earthing as required.	200	meter	37		7,400	-
10.4	5.20	Providing and fixing earth bus of 50 mm X 5 mm copper strip on surface for connections etc. as required.	80	meter	1283		102,640	-
10.5	MR	Providing and fixing earth bus of 50 mm X 6 mm GI strip on surface for connections etc. as required.	100	meter		595	-	59,500
10.6	5.10	Providing and fixing 25 mm X 5 mm copper strip in 40 mm dia G.I. pipe from earth electrode including connection with brass nut, bolt, spring, washer excavation and re-filling etc. as required.	150	meter	872		130,800	-

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
10.7	MR	Supply and installation of one number earth pit with advance maintenance free Earthing System consisting of one Number, CPRI tested copper bonded steel electrode of minimum 25 mm dia. (as per IE C62561-2) With a minimum coating thickness of 250 microns and length of 3 meters, 25 kg/ Electrode of earth enhancing compound (tested as per IEC-62561-7) fill the 100mm augered hole surrounding to the electrode, SS Universal Clamp of Size 175X50X3 mm for terminal Connection including Poly Propylene Heavy duty Pit cover including all accessories, excavation of earth, filling with back fill compound, and earth pit marking. The Complete installation shall be as per the drawing, technical specifications and as required.	25	Set		11,183	-	279,575
10.8	MR	Supply and installation of one number earth pit with advance maintenance free Earthing System consisting of one Number, CPRI tested copper bonded steel electrode of minimum 19 mm dia (as per IE C62561-2) With a minimum. coating thickness of 250 microns and length of 3 meters. 25 kg/ Electrode of earth enhancing compound (tested as per IEC-62561-7) fill the 100mm augered hole surrounding to the electrode, SS Universal Clamp of Size 175X50X3 mm for terminal Connection including Poly Propylene Heavy duty Pit cover including all accessories, excavation of earth, filling with back fill compound, and earth pit marking. The Complete installation shall be as per the drawing, technical specifications and as required.	60	Set		10,018	-	601,080
10.9	MR	Supply and installation of one number earth pit with of advance maintenance free Earthing System consisting of one Number UL Listed CPRI tested copper bonded steel electrode of minimum 13 mm dia. (as per IE C62561-2.) With a minimum. coating thickness of 250 microns and length of 3 meters. 25 kg/ Electrode of earth enhancing compound (tested as per IEC-62561-7) fill the 100mm augered hole surrounding to the electrode , SS Universal Clamp of Size 175X50X3 mm for terminal Connection including Poly Propylene Heavy duty Pit cover including all accessories, excavation of earth, filling with back fill compound, and earth pit marking. The Complete installation shall be as per the drawing, technical specifications and as required.	2	Set		8,977	-	17,954
Total Carried to Summary							434,340	1,624,509

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
11		EXTERNAL LIGHTING & FEEDER PILLAR						
		Rate for Supply, Storing, installation, tetsing & commisioning of fixtures shall also include the following :						
		All component that may be required to make the installation complete in all respects, such as:						
		a. Suitable length of connecting wires.						
		b. Connecting wires to the point through connection block.						
		c. Bonding to earth wires.						
		Drilling holes in supports wherever required.						
		Fixing clamps, GI bolts and nuts/ brass screws, saddles, rawl bolts and other fixing accessories as required.						
		Painting with enamel paint of clamps and other fixing accessories.						
		Suitable size junction boxes with connector block for loop in loop out where ever applicable.						
11.1	11.3	Erection of metallic pole of following length in cement concrete 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size) foundation including excavation and refilling etc. as required.						
11.1.1	11.3.1	Above 4.5 meter and upto 6.5 meter	190	Each	2760		524,400	-
11.1.2	11.3.2	Above 6.5 meter and upto 8.0 meter	245	Each	3322		813,890	-
11.2	MR	Supply, Installation, testing & commsiioning of 90 W LED lamp Roadway light similar to (Cat no crompton greaves LSTN-90-CDL-A) or equivalent as per tender makes on 9 mtr. High GI double arm pole including Pole complete as required.	25	Each		40,170	-	1,004,250
11.3	MR	Supply, Installation, testing & commsiioning of 90 W LED lamp Roadway light similar to (Cat no crompton greaves LSTN-90-CDL-A) or equivalent as per tender makes on 9 mtr. High GI single arm pole including Pole complete as required.	220	Each		30,581	-	6,727,820
11.4	MR	Supply, Installation, testing & commsiioning of 60 W LED lamp Roadway light of similar to Cat no crompton greaves LSTP-60-CDL or equivalent as per tender makes on 6 mtr. High GI pole complete including Pole as required.	20	Each		20,943	-	418,860
11.5	MR	Supply, Installation, testing & commsiioning of 45 W LED lamp Roadway light of (similar to Cat no crompton greaves LSTP-45-CDL) or equivalent as per tender makes on 6 mtr. High GI pole complete including Pole as required.	10	Each		11,126	-	111,260
11.6	MR	Supply, Installation, testing & commsiioning of Bollard lights 10W 900mm High (similar to Cat no crompton greaves LBSL1-10-CDL) complete as required.	80	Each		3,728	-	298,240

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
11.7	MR	Supply, installation, testing & commissioning of Bollard lights 10W 600mm High (similar to Cat no crompton greaves LBSL1-10-CDL) complete as required.	80	Each		3,728	-	298,240
11.8	MR	Supply, installation, testing & commissioning of 20M High masts with following: 20 Mtr. High mast, material of construction as per IS 5986/ BSEN 10025. Fabricated in two parts of 8.350 metre each with base and top dia 460mm and 150mm approx respectively, cross section of mast (number of sides): 20 sided polygon thickness 4mm and 3mm of bottom section and top section respectively, base plate dia 670mm x 30mm thick, PCD foundation bolt 590mm, head frame and lantern carriage with 16 nos. LED light fixtures as per Crompton Greaves catalogue no. LSFO-C300-CDL-60 with 1x300w flood light with minimum lumen/ lamp 31000, including its foundation, all accessories like feeder panel, double drum winch, SS wire rope, trailing cable L-stopper, manual operating handle, motor mounting, lighting arrestors, junction box, double dome LED aviation light, wiring of all light fixture from junction box, earthing of the pole etc. including any other item required for the proper functioning of the high mast complete as per technical specification and as required.	3	Set		726,630	-	2,179,890
11.9	MR	Supply, installation, testing & commissioning of 16M High masts with following: 16 Mtr. High mast, material of construction as per IS 5986/ BSEN 10025. Fabricated in two parts of 8.350 metre each with base and top dia 460mm and 150mm approx respectively, cross section of mast (number of sides): 20 sided polygon thickness 4mm and 3mm of bottom section and top section respectively, base plate dia 670mm x 30mm thick, PCD foundation bolt 590mm, head frame and lantern carriage with 16 nos. LED light fixtures as per Crompton Greaves catalogue no. LSFO-C300-CDL-60 with 1x300w flood light with minimum lumen/ lamp 31000, including its foundation, all accessories like feeder panel, double drum winch, SS wire rope, trailing cable L-stopper, manual operating handle, motor mounting, lighting arrestors, junction box, double dome LED aviation light, wiring of all light fixture from junction box, earthing of the pole etc. including any other item required for the proper functioning of the high mast complete as per technical specification and as required.	5	Set		698,134	-	3,490,670
11.10	5.7	Supplying and laying 6 SWG G.I. wire at 0.50 meter below ground level for conductor earth electrode, including connection/ termination with GI thimble etc. as required.	3500	Metre	28		98,000	-
11.11		Earthing						
	5.2	Earthing with G.I. earth pipe 4.5 meter long, 40 mm dia including accessories and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal/ coke and salt as required.	20	Each	3672		73,440	-
11.12	MR	Providing and laying of 3 core x 1.5 sqmm flexible cable in existing PVC/ MS Pipe concealed or surfaced complete in all respect.	3000	RM		43	-	129,000

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
11.13	MR	Supply, laying, testing & commissioning of following sizes of XLPE insulated PVC sheathed, FRLS, Cu. conductor armoured power cable of 1.1 KV grade conforming to IS amended upto date and as per specifications.						
11.13.1	MR	3 C x 10 Sqmm	3200	Metre		376	-	1,203,200
11.13.2	MR	3 C x 6 Sqmm	4500	Metre		234	-	1,053,000
11.14	MR	Supplying and making end termination with brass compression gland and Cu. lugs for following size of PVC insulated and PVC sheathed/ XLPE Cu. conductor cable of 1.1 KV grade as required.						
11.14.1	MR	3 C x 10 Sqmm	250	Nos.		230	-	57,500
11.14.2	MR	3 C x 6 Sqmm	220	Nos.		228	-	50,160
11.15	MR	External lighting-Feeder Pilar						
		Design, supply, installation & commissioning of floor/ wall mounting/ free standing, totally enclosed compartmentalized, cubical, dust, vermin proof external lighting panel fabricated out of 2mm thick cold rolled carbon annealed, sheet steel, internally straightened with 35mm x35mm x6mm angle iron frame work with hinged centre opening type double doors, (fabricated out of 2mm CRCA sheet steel) The fabricated panel with IP-65 as enclosure protection as per specification						
		Supplying and mounting including making connections/ interconnection with lugs/ glands testing and commissioning of following items inside the panel.						
		Incomer						
i)		Aluminium bus strips of high electrolytic conductivity 200A, 3- Phase with neutral, 415V, 50 Hz, (+/- 10%) AC supply -1set.						
ii)		MCCB 4 pole 100 Amps, 25 kA, 415 V, 3 phase, AC supply with in built overload, short circuit & ON/ OFF indication on the front- 1No.						
iii)		LED type phase indicating (R-Y-B) lamps provided with MCB's protections and individual toggle switches having lens and lamp visible from the front -1set.						
iv)		1 Set of (0-500V) voltmeter with selector switch & Control MCB's.						
v)		1 Set of (0-100A) ammeter with selector switch & 100/5A ratio CTs.						
vi)		1 No. Astronomical timer						
		Outgoings						
i)		MCBs 16A/20A, DP, 10kA, C series -7 Nos. on each phase						
ii)		MCBs 25A/40A, 4P, 10kA, C series -2 Nos.						
		Feeder Pilar as described above	4	Set		38,783	-	155,132
		TOTAL CARRIED TO SUMMARY					1,509,730	17,177,222

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
12		IP CCTV SURVEILLANCE SYSTEMS						
		Server considered separately on other packages.						
12.1	MR	Supply, installation, testing and commissioning of Outdoor IR 1080p 60fps HD PTZ Camera with 1/2.8" progressive scan Exmor CMOS, Effective pixels 1920 x 1080 approx. 2.1M pixels, 30x Optical Zoom 4.5 mm - 135 mm (F1.6 - F4.4); Optical Zoom Field of View (FOV) :- 2.4° - 60.9°, 16X Digital Zoom, Minimum Illumination-Sense up on- Color: 0.05 lux, B/W: 0.01 lux, With infrared (IR) 0 lux, WDR 90dB, Video Analysis (Object removal, Loitering, Enter or Exit from the Field, Object Classification etc.) Intelligent Dynamic Noise Reduction, BLC, White Balance, Mechanical switchable IR filter, Pan Range 360° continuous, Tilt Range 0°-90°, Pan/ Tilt Modes - Pan: 0.1°/s - 240°/s; Tilt: 0.1°/s - 120°/s, Presets 256 , Tours, IR distance 150 m (590 feet) (Detection), IR can be internal or external with full 360 deg PAN coverage Audio- 1/1 Channel In/ Out, Memory card slot (support upto 1TB), 24 individually configurable privacy masks, Simple singlecable installation with POE+ support for indoor/ Outdoor application, art. site condition.	29	Nos.		62,014	-	1,798,406
12.2	MR	Supply, installation, testing and commissioning of 5MP 30 fps HD Outdoor IR IP bullet camera with 1/2.9-inch CMOS, Sensor pixels 2612 (H) x 1980(V), Sensitivity-0.24 lx (color) 0.05 lx (mono), IR range 60 mtrs, Dynamic range 100 db, True day/ night, Automatic Electronic Shutter, Video compression H.265 MP; M-JPEG, White balance, BLC, H.265 quad-streaming, Video Analysis (Object removal, Loitering, Enter or Exit from the Field, Object Classification etc.), Privacy Mask, Analog video output, Auto Varifocal Lens (zoom/ focus) 2.7mm to 12 mm lens, Two-way, full duplex Audio, Audio compression AAC, G.711, L16 (live and recording), 60 s pre-alarm recording Memory card slot support upto 256 GB, IP66, ONVIF Profile S.	2	Nos.		56,882	-	113,764
12.3	MR	Supply, Installation & Commissioning of Workstation latest Intel® i7 7th Generation, processor, Intel Chipset motherboard, 8GB DDR3 RAM, 500 GB SATA HDD at 7200 rpm, Graphic card with 2 GB edicated RAM with display ports/ DVI/ HDMI port, DVD writer, Giga LAN Card, Keyboard, optical Mouse as per list of approved makes.	1	Nos.		127,410	-	127,410

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
12.4	MR	Supply, Installation & Commissioning of 55" Monitor complete as required	1	Nos.		58,006	-	58,006
12.50	MR	Supply, Installation & Commissioning of 32" Monitor complete as required	1	Nos.		35,448	-	35,448
12.60	MR	Supply, Installation, Testing & Commissioning of 12 ports full loaded LIU Box with all the required pigtailed complete in all respect as approved by Engineer in charge of works.	4	Nos.		11,099	-	44,396
12.70	MR	Supply, Installation, Testing & Commissioning of 1-port 1000BASE-LX Small Form Factor Pluggable (SFP) Gigabit Ethernet Transceiver, connector type: LC. Digital Diagnostic Monitoring Interface. Complete in all respect up to entire satisfaction Engineer in charge of works. Switch and SFP should be from same OEM only	8	Nos.		22,395	-	179,160
12.80	MR	Supply, Installation, Testing & Commissioning of OFC Patch Cord.	4	Nos.		2,251	-	9,004
12.90	MR	Supply, Installation, Testing and commissioning of Managable 24 port Switch with Power on Ethernet (PoE) enabled, 10/100, RJ45 Access ports with PoE complete as required	2	Nos.		34,908	-	69,816
12.10	MR	Supply, Installation, Testing and commissioning of Layer -2 Switch with Power on Ethernet (PoE) enabled, 24 x Gigabit RJ45 Access ports with PoE+, including 2 x Combo Gigabit ports, plus 2 x 10 Gigabit SFP+ Uplink ports and 2 x 10 Gigabit SFP+ dual-use Stack/ Uplink ports, All 24 access ports should be capable of providing 30W of Power uddget Non-Blocking Switching fabric of 128 GBPS and Forwarding rate of 95 MBPS, 16 K MAC Address and 256 VLAN Operating Temperature – 0 to 50* C, RIP v1/v2 Dynamic IP Routing, DHCPv6 Guard, Multicast Listener Discovery v1/v2 Snooping & Proxy, IPv6 features, including First-Hop Security, Neighbour Discovery Inspection, Source Guard, and Router Advertisement Guard with 600VA UPS, 15M Backup, Internal SMF Batteries Switch and SFP should be from same OEM only.	2	Nos.		36,063	-	72,126
12.11	MR	Supply, Installation, Testing and commissioning Core Switch Layer 3 Port Density: 12 x 10/ 100/ 1000 Base-T PoE+ ports, 36 x 1G SFP ports and two 10G SFP+ uplink port, Switching Fabric - 172 Gbps Packer Forwarding - 100 Mbps, 32K MAC Addresses and 4K VLAN and Switch configured with 2GB of 800 DDR3 DRAM JUMBO FRAME: At least 9Kb support, support internal Field Replaceable and Hot Swappable PSU in N+N Redundancy architecture from day 1.Layer 3 Features - Static Routing, RIPng, OSPFv3, VRRP, PIM SM and BGP+ support from day 1 Should support up-to at least 4000 IP Multicast Streams simultaneously and at least 4000 IGMP interfaces Switch should have capability to support MAC-Sec in future, if required, Core Switch should ideally be EAL/ NDcPP certified, Operating Temperature-0 to 50*C Switch and SFP should be from same OEM only.	1	Nos.		238,768	-	238,768

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
12.12	MR	Supply, Installation, Testing & Commissioning of 24 Port Patch Panel.	4	Nos.		4,824	-	19,296
12.13	MR	Supply, Installation, Testing & Commissioning of 6U rack indoor/ outdoor for switch Mounting with Fan and power Strip, PDU, Hardware Mounting Kit	2	Nos.		9,208	-	18,416
12.14	MR	Supply, Installation, Testing & Commissioning of 3 Core Power Cable 1.5 sqmm.	3000	Meters		100	-	300,000
12.15	MR	Supply, Installation, Testing & Commissioning of Single mode 6 OFC ARMoured cable.	2000	Meters		96	-	192,000
12.16	MR	Supply, Installation, Testing & Commissioning of CAT 6 STP Cable complete in all respect up to entire satisfaction Engineer in charge of works.	2400	Meters		67	-	160,800
12.17	1.2	Supply and fixing of following sizes of PVC conduit along with the accessories in surface/ recess including painting in case of surface conduit, or cutting the wall and making good the same in case of recessed conduit as required						
12.17.1	1.21.2	25 mm dia	1500	Meters	69		103,500	-
12.18	MR	Supply, Installation, Testing and Commissioning of 10 KVA UPS On Line With 1 hour Backup complete in all respect up to entire satisfaction Engineer in charge of works	1	Nos.		254,636	-	254,636
12.19	MR	Supply, Installation, Testing and Commissioning of 10/ 100/ 1000 Media Converter.	2	Nos.		22,183	-	44,366
12.20	MR	Supply, Installation, Testing and Commissioning of Junction Box.	5	Nos.		5,107	-	25,535
12.21	14.14	Providing, laying and fixing following dia RCC pipe NP2 class (light duty) in ground complete with RCC collars, jointing with cement mortar 1:2 (1 cement : 2 fine sand) including trenching (75 cm deep) and refilling etc as required (for road crossing)						
a.	14.14.4	300 mm dia	200	Meters	592		118,400	-
b.	14.14.2	150 mm dia	260	Meters	405		105,300	-
12.22	MR	Supply, Installation, Testing and Commissioning of 6m high (5m above ground) 80mm dia upto 3 meter and 60mm dia for other 3meter GI pole as approved, adopting socket at top for fixture mentioned below, base plate 300 x 300 x 6 mm and provision for mounting junction box etc. - 1 set.ith suitable cement concrete foundation including excavaton, ncluding supply and fixing of foundation & all civil work suitable for outdoor camera includng connection etc. complete as per pecifications & as required for mounting of PTZ CCTV Camera.	29	Nos.		18,922	-	548,738
TOTAL CARRIED TO SUMMARY							327,200	4,310,091

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
13		<u>OUTDOOR PA SYSTEM</u>						
13.1	MR	Landscape garden speaker built-in 70v/ 100v transformer. The built-in 6.5"+1.5" two-way waterproof speaker driver is designed of wide frequency response 120-15kHz, the multiple power taps of 12.5W & 25W with Heavy damage proof nish, Max. SPL (Rated W/ 1M) 108dB±3dB.	15	Nos.		10,180	-	152,700
13.2	MR	IP network audio adopter built-in digital class-D 500W amplifier Direct to receive internet audio source and transmit to 70V, 100V and low impedance loudspeakers. Non-dedicated network system solution. Could be installed anywhere of the LAN network. Economy network audio solution for multiple speaker applications.	1	Nos.		355,986	-	355,986
13.3	MR	Horn speaker built-in 70v/ 100v transformer The built-in horn speaker driver is designed of wide frequency response 250-8kHz, the multiple power taps 7.5W & 15W.	60	Nos.		4,558	-	273,480
13.4	MR	IP network audio adopter built-in digital class-D 500W amplifier Direct to receive internet audio source and transmit to 70V, 100V and low impedance loudspeakers. Non-dedicated network system solution. Could be installed anywhere of the LAN network. Economy network audio solution for multiple speaker applications.	4	Nos.		355,986	-	1,423,944
13.5	MR	IP Network Audio Adaptor for the Integration with Third Party Audio System.	1	Nos.		160,132	-	160,132
13.6	MR	Built-in single channel TCP/ IP decoder Decode digital audio data to analogue amplifier Hear of IP background music, zone paging & voice alarm system Built-in 3.4-inch LCD screen display the IP address and status in English n.	1	Nos.		447,300	-	447,300
13.7	MR	The IP network paging microphone has several paging modes include: zone paging, group paging, all zone paging, two-way intercom, conference system, discussion system & voting system. The IP network paging microphone is built-in a LCD to display program status and its IP address, end-user is accessible to change the IP setting.	6	Nos.		197,841	-	1,187,046
13.8	MR	SOFTWARE	1	Nos.		70,122	-	70,122
13.9		PC	1	Nos.		43,590	-	43,590
13.10	MR	Speaker Cable	4000	RM		72	-	288,000
13.11	MR	Microphone Cable	500	RM		72	-	36,000
13.12	MR	Cat6 Cable	2000	RM		72	-	144,000
		Total Carried to Summary					-	4,582,300

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
14		<u>EPABX SYSTEM</u>						
14.1		DIGITAL EPABX SYSTEM (COMMUNICATION SERVER)						
		Supply, installation, testing & commissioning of 32 bit microprocessor based, fully digital, 100% non blocking, PCM-TDM, true ISDN & PRI Line and IP ready digital EPABX with distributed architecture for power supply cards, as per specifications with following configuration:						
		IP PBX 2000 Extensions Expandable upto 10000 extension						
		IP User -50 users						
		Configured For-						
		Analog P&T Lines- 32 (Expandable upto 48 Lines)						
		ISDN PRI Line (30 Channels)- 6 nos with CLIP Facility						
		24 Extension Digital Card : 2no						
		SUBSCRIBER INTERFACE:						
		Voice Mail system Consisting of Voice mail Boxes for all Users, Auto attendted system with greeting messages						
		PC for Attending voice mail system						
		Redundant Lan Port and Wan Port-2						
		Redundant Call Processor						
		Redundant Power Supply						
		Full Software Licences & Support						
		In-built Music on Hold						
		Remote maintenance.						
		Ethernet port for LAN connectivity and System Management						
		Support for Voice over IP (VoIP)						
		Day/ Night service						
		8 party conference Facility						
		Speed Dail						
		Support for OFC Connectivity						
		Support for Wi-Fi based wireless extensions.						
		System Documentation on CD-ROM						
		Hot Standby Duplication of all common control card without call disconnection.						
		IP Based operator Console with PC - 1 Nos.						
		should support IP Telephony and should be able to intergrate other EPBAX System on IP						
		DIGITAL EPABX SYSTEM AS MENTIONED ABOVE	1	Set		10,799,541	-	10,799,541
14.2		DIGITAL EPABX SYSTEM (COMMUNICATION SERVER)						
		Supply, installation, testing & commissioning of 32 bit microprocessor based, fully digital, 100% non blocking, PCM-TDM, true ISDN & PRI Line and IP ready digital EPABX with distributed architecture for power supply cards, as per specifications with following configuration:						
		IP PBX 400 Extensions Expandable upto 2000 extension						
		IP User -24 users						
		Configured For-						
		Analog P&T Lines- 8 (Expandable upto 12 Lines)						
		ISDN PRI Line (30 Channels)- 1 nos with CLIP Facility						
		24 Extension Digital Card : 1no						
		SUBSCRIBER INTERFACE:						
		Voice Mail system Consisting of Voice mail Boxes for all Users, Auto attendted system with greeting messages						
		PC for Attending voice mail system						
		Redundant Lan Port and Wan Port-2						
		Redundant Call Processor						
		Redundant Power Supply						

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
		Full Software Licences & Support						
		In-built Music on Hold						
		Remote maintenance.						
		Ethernet port for LAN connectivity and System Management						
		Support for Voice over IP (VoIP)						
		Day/ Night service						
		8 party conference Facility						

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
		Speed Dial						
		Support for OFC Connectivity						
		Support for Wi-Fi based wireless extensions.						
		System Documentation on CD-ROM						
		Hot Standby Duplication of all common control card without call disconnection.						
		IP Based operator Console with PC - 1 Nos.						
		should support IP Telephony and should be able to intergrate other EPBAX System on IP						
		DIGITAL EPABX SYSTEM AS MENTIONED ABOVE	6	Set		2,374,508	-	14,247,049
14.3		Flaot Cum Boost Charger (FCBC) for Above EPBAX System 48 V/125 Amp Inculding SMS Batteries with 2 hr Battery Back Up)	7	Set		115,884	-	811,188
14.4		Supply, Installation, Testing and commissioning of IP Digital Phone having following features						
		IP Hard Console Phone						
		Full Colour VGA Display with 4096 different colours!						
		Full alphabetic keyboard						
		Key-based navigation						
		Hands free operation						
		Best in Class loudspeaker for speakerphone operation; also includes microphones						
		Jack for headset expansion						
		Compatible with PC applications						
		Bluetooth connectivity for the ultimate in integration						
		2 Ethernet ports						
		Downloadable admin softwar						
		Eight Personalized Ring Patterns.						
		Either desk or wall mountable.						
		DIGITAL IP PHONES AS MENTIONED ABOVE	50	Set		17,089	-	854,426
14.5		Supply, installation of 24-port loaded, Angled Jack Panel compatible for Cat-6 cable, with labels and clear label covers, Height, 1U including all accessories as required.	15	Set		49,676	-	745,139
14.6		Supply, Installation, Testing and commissioning of Digital Phone having following features (Before procurement of this item, the contractor shall have necessary approval approval of quantity from HSCC/ Client.						
		Adjustable graphical display						
		Resolution 64X128 pixels.						
		Size 70X38 mm						
		Socket for headset						
		40 Programmable keys						
		2X3 contextual keys, 2 personal keys/LED						
		Navigator keys 4 directions						
		Alphabetic keyboard (Dial by name)						
		Feature keys Like: Message + LED, Redial, End Key, Volume +/-, Mute with LED, Help, Handsfree with LED						
		Digital Phone AS MENTIONED ABOVE	150	Set		7,749	-	1,162,416
14.7		Supply of Analog phones having following features (Before procurement of this item, the contractor shall have necessary approval approval of quantity from HSCC/ Client.						
		FSK/ DTMF Compatible Caller-Id						
		16 Digit LCD single Display						

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
		30 Incoming Memory						
		5 Outgoing Memory						
		Real Time Clock with Year, Date and Month display						
		Conversation Time Display (Approx.)						
		6 Step LCD Contrast Adjustable						
		36 Digits Redial Memory						
		Auto Filter Local Area Code up to 5-digit						
		Real time & Date in Idle Mode						
		Analog phones as mentoned above	2500	Sets		616	-	1,540,000
		TOTAL CARRIED TO SUMMARY					-	30,159,758

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
15		BUILDING MANAGEMENT SYSTEM (BMS)						
		Design, Supply, Installation, Testing, Commissioning & Handing over the Building Management System (BMS) and allied systems as per specifications as below.						
15.1	MR	BMS Computer System: PC (i7 with latest Generation processor), 16GB RAM, 52X DVD Writer, 22" LED Color monitor, 1 TB HDD SATA, Microsoft Bus mouse with pad, 2serial, 1 parallel port, Windows 10 operating system, 104 Keyboard, Expansion Bus with spare Slot, with original license, protection & restore key, includes LAN Card, USB ports and furniture for system (one table and one chair).	1	No.		94,965	-	94,965
15.2	MR	BMS System Software: Web Based UL listed Graphical Software meeting the requirements in the Given I/O Summary and technical specifications including configuration and facility to create/ provide the graphic mapping for all I/O Summary points, animate the Graphics, Navigation between pages, display of logs, changing the time zones, popup alarms, configurable password protection for Building Mgmt System as per Specifications. Software shall be able to communicate with Lonworks, Bacnet, Modbus devices simultaneously. Same software can be utilized as programming/ commissioning software of DDC, NAC etc.	1	No.		618,074	-	618,074
15.3		Energy Analytics/ Energy Auditing System Software: Web Based Graphical Software meeting the requirements in the Given I/O Summary and technical specifications including configuration and facility to create/ provide the graphic mapping for points, animate the Graphics, configurable password protection for Energy Auditing Software as per Specifications.	1	No.		104,987	-	104,987
		Note:						
		All required Software with original license competent with BMS software)						
15.4	MR	Web Based Router/ Network Area Controller interfacing the DDC controllers and Integrators for the system with PC. It has capacity to store trends & program backup. It should be BTL & UL Listed.	1	Lot		38,462	-	38,462
15.5	MR	Web Based Integrator for interfacing Modbus RTU Unit, Bacnet IP/ MSTP, Open Protocol Software Integration for following:						
15.5.1	MR	For 7 Nos. Chiller System Interface on BACnet IP/ Modbus RTU/ BACnet MSTP	1	Lot		32,071	-	32,071
15.5.2	MR	For 42 Nos. Lifts Interface on Bacnet over IP/ Modbus RTU	1	Lot		32,071	-	32,071
15.5.3	MR	For Fire Alarm System Panel on Bacnet over IP/ Modbus RTU (approx. 4000 detectors)	1	Lot		17,117	-	17,117
15.5.4	MR	For Diesel Generator - 6 Nos. on Bacnet over IP/ Modbus RTU	1	Lot		17,117	-	17,117
15.5.5	MR	For KWH & MFM on Modbus RTU (200 Nos.)	1	Lot		32,071	-	32,071

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
15.5.6	MR	For Variable Frequency Drives for Pumps & AHU's, cooling towers, HRW's and Ventilation Fans on Modbus RTU.	1	Lot		32,071	-	32,071
15.5.7	MR	For Automatic Chilled water and condenser water chemical dosing system on Modbus RTU	1	Lot		17,117	-	17,117
15.5.8	MR	For Access control Integration	1	Lot		32,071	-	32,071
15.5.9	MR	For CCTV Integration	1	Lot		32,071	-	32,071
15.5.10	MR	For Ventilation on Modbus RTU	1	Lot		32,071	-	32,071
15.6	MR	Automation stations/ DDC Controller, The controllers shall be 32 bit microprocessor based. The DDC's shall be capable of peer to peer communication without help of system interface controller or PC. with locable MS mounting cabinets (see cabinet requirements in specs) duly powder coated connector strip, internal wiring and space to house controller & relays, connector strip current transformer, MCB, internal wiring. (Contractor shall confirm his I/O provision w.r.t requirement on basis of data point) on Bacnet. Controllers should be BTL & UL Listed. Quoted prices shall be inclusive of UPS power switch socket for each DDC Panel. No merging of any DDC panels into one						
15.6.1	MR	DDC Panel for Chiller Plant Room (at least 7 panels to be considered)	1	Lot		341,339	-	341,339
15.6.2	MR	DDC Panel for AHUs (max 2 AHU's/ DDC to be considered)	250	Nos.		70,479	-	17,619,750
15.6.3	MR	DDC Panel for HRW Units	33	Nos.		70,479	-	2,325,807
15.6.4	MR	DDC Panel for Pressurization Fans	1	Lot		38,825	-	38,825
15.6.5	MR	DDC Panel for Toilet Ventilation Fans	1	Lot		38,825	-	38,825
15.6.6	MR	DDC Panel for Fire Fighting System	1	Lot		38,825	-	38,825
15.6.7	MR	DDC Panel for Water Supply System	1	Lot		38,825	-	38,825
15.6.8	MR	DDC Panel for DG System/Transformer	1	Lot		38,825	-	38,825
15.6.9	MR	DDC Panel for HT/ LT Panel	1	Lot		331,459	-	331,459
15.6.10	MR	DDC Panel for Lifts	1	Lot		70,479	-	70,479

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
15.7	MR	Automation stations/ DDC Controller, The controllers shall be 32 bit microprocessor based. The DDC's shall be capable of peer to peer communication without help of system interface controller or PC. with locable MS mounting cabinets duly powder coated connector strip, internal wiring and space to house controller & relays, connector strip current transformer, MCB, internal wiring. (controller shall have 25 I/O points provision w.r.t requirement on basis of data point) on Bacnet. Controllers should be BTL/ UL Listed. Quoted prices shall be inclusive of UPS power switch socket for each DDC Panel. (20% spare IO's to be considered.)	1	LOT		53,618	-	53,618
Note:	a	Provision of integration with any BMS system conforming to ASHRAE BACnet/ IP or MODBUS IP, OPC shall be provided by respective equipment manufacture.						
15.8	MR	Sensors and field devices						
		Supply, installation, testing, commissioning of necessary input sensor transmitters/ transducers comprising the following:						
Note:		All BMS sensor Mounted open to air should have weather proof rating or enclosure.						
15.8.1	MR	Resistance type immersion temperature sensors for measuring Chilled water, condenser water temperature (Range 0-50 Deg C). The accuracy shall be at least ± 1 degree C. The pressure rating shall be 10 kgf/sq cm.	26	Nos.		2,178	-	56,628
15.8.2	MR	Outside air temperature, humidity RH & Wetbulb sensors for measuring outside air temperature (Range 0-50 °C). The accuracy of temperature sensor shall be ± 1 degree C and RH sensor is $\pm 3\%$. It should be provided with sun sheild and rain protection. It should be IP 66.	2	Nos.		6,489	-	12,978
15.8.3	MR	Water Level Switches for indicating level status in Cooling Tower, sumps & Water Tanks.	60	Nos.		36,654	-	2,199,240
15.8.4	MR	Water Differential Pressure Switch across the Pumps for indicating the Pump status of Pumps complete with all accessories.	2	Nos.		4,522	-	9,044
15.8.5	MR	Air Differential pressure switches across Air Filters for indicating status. Pressure differential – 10 mm–125 mm. The switch shall be with connecting tube and metal bends for connections to the duct. The housing shall be IP 54 rated.	212	Nos.		5,956	-	1,262,672
15.8.6	MR	Bacnet Compatible UL Listed duct mount CO2 Sensor, Measuring range 0-2000PPM CO2 with sensing resolution 1ppm, Response time (0-90%) should be 1 Minute & Warm-up Time should less than 1 minute.	161	Nos.		14,877	-	2,395,197
15.8.7	MR	Flame Proof Level Transmitter for Diesel Bulk & Day Oil tanks.	6	Nos.		34,097	-	204,582
15.8.8	MR	Flame Proof Flow Meters for DG.	6	Nos.		34,097	-	204,582
15.8.9	MR	Water Flow Switch	12	Nos.		70,720	-	848,640

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
15.8.10	MR	UL Listed Current Relay with built in LEDs for On/ Off commands Status.	10	Nos.		2,100	-	21,000
15.8.11	MR	Duct Pressure sensors with copper/ metal tubing, accessories etc.	212	Nos.		6,489	-	1,375,668
15.8.12	MR	Air Duct Temperature Sensor (Range 0-50 Deg C) shall be with rigid stem and of averaging type. These shall be Platinum sensor suitable for duct installation and accuracy shall be ± 1 degree C, for measuring supply -air temperature of AHUs etc.	33	Nos.		2,645	-	87,285
15.8.13	MR	Wall mount room temperature sensor for measuring space/ room temperature. Measuring range 0 to 40°C with accuracy ±1°C (in AHU rooms for return air temperature sensing).	146	Nos.		6,489	-	947,394
15.8.14	MR	Chilled water Line Pressure sensors UL listed 0-30 kg/ Sq.Cm.	8	Nos.		2,645	-	21,160
15.9	MR	Conduiting, Wiring and cabling						
		Supply, laying, termination, testing and commissioning of following cables:						
15.9.1	MR	1.1kV grade LT PVC insulated, FR-LSH PVC sheathed, stranded Copper conductor, Armoured cables as per IS:1554 of following sizes:						
a.	MR	2 Core 1.0 Sqmm, for Field devices	61775	RM		72	-	4,447,800
b.	MR	3 Core 1.5 Sqmm, for for Powering DDC, Actuators etc.	20450	RM		102	-	2,085,900
15.9.2	MR	2 Core 1.0 Sqmm, 1.1 KV grade PVC Insulated, PVC Sheathed, stranded flexible copper conductor, un-armoured cable as per IS:1554 for Field devices, for last mile connectivity.	9970	RM		39	-	388,830
15.9.3	MR	3 Core 1.0 Sqmm, 1.1 KV grade PVC Insulated, stranded copper conductor, armoured, twisted & Shielded cable as per BS: 5308/ IS: 694/ IS 1554, for communication.	150	RM		45	-	6,750
15.9.4	MR	PVC insulated, Twisted Pair, tinned copper conductor CAT-6 UTP cables for BMS Network.	5570	RM		60	-	334,200
15.9.5	MR	Providing and fixing in position of rigid FRLS PVC conduit including bends, junction boxes, pull boxes, GI pull wire including necessary civil work such as chase cutting, chipping, making good for recessed conduiting or clamping on surface with saddles, clamps etc. for surface conduiting:						
a)	MR	25mm dia, 2mm thick FRLS PVC conduit.	500	RM		54	-	27,000
b)	MR	20mm dia, 2mm thick FRLS PVC conduit.	500	RM		51	-	25,500
c)	MR	Supply & Fixing heavy duty steel reinforced PVC Flexible conduit with coupler at both ends. (25mm dia)	3780	RM		46	-	173,880
15.9.6	MR	Supplying, installing, testing and commissioning of 2.0 mm thick GI perforated cable trays of the following sizes complete with angle iron supports/ hanging arrangement etc.						
a.	MR	300 x 50	800	RM		507	-	405,600
b.	MR	200 x 50	800	RM		469	-	375,200
c.	MR	150 x 50	800	RM		442	-	353,600

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
d.	MR	100 x 50	400	RM		378	-	151,200
e.	MR	50 x 50	400	RM		332	-	132,800
15.9.7	MR	Supplying, installing, testing and commissioning of 2.0 mm thick GI trunking of the following sizes complete with angle iron supports/ hanging arrangement etc.						
a.	MR	300 x 150	800	RM		515	-	412,000
b.	MR	100 x 50	200	RM		378	-	75,600
15.9.8	MR	Supply, laying, Testing & commissioning of 12 Core, 50/ 125 Micron, OM2, Armoured, Outdoor Unitube Single/ Multi Mode fiber cable.	1860	RM		157	-	292,020
15.9.10	MR	Supply, Installation, Testing & commissioning of Adaptor plate with 6 SC simplex Single Mode adaptors	8	Nos.		472	-	3,776
15.9.11	MR	Supply, Installation, Testing & commissioning of Outdoor Fibre Cable Joint kit including all accessories suitable for single mode 12 core armoured cable	8	Nos.		472	-	3,776
		IMPORTANT NOTES						
1		The offered BMS shall be WEB-BASED system offering Multi-user interface without need of any proprietary BMS software License.						
2		Minimum 5 simultaneous users shall be able to log-in to the BMS WEB-SERVER. The number of users, otherwise, shall be unlimited.						
3		The Offered Web-Server and Embedded Web-Server Engines shall be capable of getting Dynamically Addressed on the DHCP Server.						
4		Number of controllers shall have spare capacity for future expansion upto 20% for each type of IO point and at System Level (Software shall have expansion capacity of 25 % IO Points and 25% Software Points)						
5		Wiring of motorized actuator shall be in BMS vendor scope and the power source shall be routed through the respective BMS panel which has UPS power.						
6		Mux not acceptable for two operating system.						
		Total Carried to Summary					-	41,410,415

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
16		<u>BOOM BARRIER SYSTEM</u>						
16.1	MR	Supply, installation, testing and commissioning of automatic boom barrier suitable for 5.0m-7.5m road width for intensive applications, high speed with 4.5 second opening time with Straight aluminium boom of minimum size 100mm x 70 mm, built in blinker indicator etc. complete as required as per specifications & at site of work.	10	Set		276,397	-	2,763,970
16.2	MR	Supply, installation, testing and commissioning of a set of Entry/ Exit push buttons for manual open and closing of barrier etc. complete as required.	10	Set		4,269	-	42,690
		TOTAL CARRIED TO SUMMARY					-	2,806,660

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
17		MISC. WORKS						
17.1	14.16	Supplying and laying of following size DWVC HDPE pipe ISI marked along with all accessories like socket, bend, couplers etc. conforming to IS 14930, Part II complete with fitting and cutting, jointing etc. direct in ground (75 cm below ground level) including excavation and refilling the trench but excluding sand cushioning and protective covering etc. complete as required.						
	14.16.2	90 mm dia (OD-90 mm & ID-76 mm nominal)	1500	Mtrs	163		244,500	-
17.2	14.14	Providing, laying and fixing following dia RCC pipe NP2 class (light duty) in ground complete with RCC collars, jointing with cement mortar 1:2 (1 cement : 2 fine sand) including trenching (75 cm deep) and refilling etc. as required.						
	14.14.2	150 mm dia	100	Mtrs	405		40,500	-
	14.14.4	300 mm dia	9340	Mtrs	592		5,529,280	-
17.3		Constructing water tight brick masonry manhole with 75 class designation bricks in cement mortar 1:4 (1 cement: 4 coarse sand), R.C.C. top slab with 1:2:4 mix (1 cement: 2 coarse sand: 4 graded stone aggregate 20 mm nominal size). Foundation concrete 150 mm thick 1:4:8 mix (1 cement: 4 coarse sand :8 graded stone aggregate 40 mm nominal size), inside and outside plastering 12 mm thick with cement plaster 1:3 (1 cement :3 coarse sand) finished with a floating coat of neat cement and making channels and benching in cement concrete 1:2:4 mix (1 cement: 2 coarse sand: 4 graded stone aggregate 20 mm nominal size) finished with a floating coat of neat cement complete as per standard design, complete with DI cover Heavy duty of adequate size as per standard design and approved drawings. (Price shall include the, cost of excavation, back filling, disposal of surplus earth, dewatering & water proofing of manholes as directed at site & other associated civil works).						
17.3.1		Inside size 600mm x 600 mm x 750 mm deep.	47	Each		12,358	-	580,826
17.3.2		Inside size 800mm x 900mm x 750mm deep.	130	Each		14,998	-	1,949,740
17.3.3		Inside size 600mm x 600 mm x 1100 mm deep.	74	Each		12,358	-	914,492
17.3.4		Inside size 800mm x 900mm x 1100mm deep.	100	Each		15,118	-	1,511,800
17.3.5		Extra over item above for depth exceeding 75 cm to 90 cm.	2	RM		10,319	-	20,638
17.3.6		Extra over item above for depth exceeding 900-2500 cm.	2	RM		19,235	-	38,470
		TOTAL CARRIED TO SUMMARY					5,814,280	5,015,966

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
18		<u>SAFETY EQUIPMENTS</u>						
18.1	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.	12	Each	149		1,788	-
18.2	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.	30	Each	163		4,890	-
18.3	MR	Supply and fixing wooden framed covered with glass shock treatment chart printed on cloth in English, Hindi & Local language.	15	Each		6,989.00	-	104,835
18.4	MR	Supply and fixing suitable size wooden framed covered with glass for Main Panel SLD in electrical room as per IE rules fixed to wall as required.	12	Each		8,543.00	-	102,516
18.5	MR	Supply, installation, testing and commissioning of Standard First aid box complete with all accessories as required.	12	Each		1,281.00	-	15,372
18.6	MR	Supply and Installation of M.S. buckets 5 nos. of 20 litres capacity painted with red oxide paint & lettered as 'Fire' with White and mounted on free standing stand, as required including filling with dry sand.	12	Set		4,194.00	-	50,328
18.7	MR	Supply and Installation of Portable 5 kg. dry type fire extinguisher suitable for electrical fire and as recommended by the tariff advisory committee.	4	Each		1,815.00	-	7,260
18.8	MR	Supply and fixing of in-position the fire extinguishers dry chemical power (ABC) 5 kg capacity.	4	No.		2,265.00	-	9,060
18.9	MR	Supply and fixing of in position the fire extinguishers dry chemical power (ABC) 2 kg capacity.	4	No.		1,153.00	-	4,612
18.10	MR	Supply and fixing of tool kit with all standard tools such as screw driver, spaner etc as required.	5	Each		8,586.00	-	42,930
18.11	MR	Supply and Installation of Elastomer mat 1000 mm. wide, 2mm thick, for upto 3.3kV grade as per Latest BIS Codes (IS: 15652/ 2006). (Vendor to check the thickness of the mat as per latest IS code & Quoe accordingly and also mention the thickness provided).	200	RM		946.00	-	189,200
18.12	MR	Supply and Installation of Elastomer mat 1000 mm. wide, 2.5mm thick, for above 3.3kV and upto 11 kV grade as per Latest BIS Codes (IS: 15652/ 2006). (Vendor to check the thickness of the mat as per latest IS code & Quoe accordingly and also mention the thickness provided).	320	RM		1,193.00	-	381,760

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
18.13	MR	Supply and Installation of Elastomer mat 1000 mm. wide, 3mm thick, for above 11kV and upto 65kV grade as per Latest BIS Codes (IS: 15652/2006). (Vendor to check the thickness of the mat as per latest IS code & Quote accordingly and also mention the thickness provided).	100	RM		1,516.00	-	151,600
18.14	MR	Supply and Installation of Rubber gloves of 11 KV grade as per per Latest BIS Codes	10	Pair		582.00	-	5,820
18.15	MR	Supply and Installation of Rubber gloves of 33kV/ 22kV grade as per per Latest BIS Codes	10	Pair		1,106.00	-	11,060
		TOTAL CARRIED TO SUMMARY					6,678	1,076,353
19		<u>SPECIALIZED SERVICES OF AUDITORIUM</u>						
19.01		Supply, Installation, Testing & Commissioning of 54x3W CE certified LED Par with CCT 3200K,12310 lux level at 2mtr, 54 LED's each should be at warm color temperature of 3200K, back LED display, CRI Value above 85, Self dimming option from 0-100%, 5 Pin Dmx XLR for mix dimming operation but without any accessories, loop in loop out option. undergone through 7 Tank chemical treatment to keep them rust free and, black matt texture finish etc. all complete. Make:Robe / Martin / Canara lighting	16	No.		29,232.00	-	467,712
19.02		Supply, Installation, Testing & Commissioning of 3x54W LED par light complete with 8-channel DMX 512, high brightness mixing color evenly, stable performance with sound active auto, DMX, and power and DMX loop in and out option. undergone through 7 Tank chemical treatment to keep them rust free and, black matt texture finish etc. all complete. Make:Robe / Martin / Canara lighting	38	No.		25,892.00	-	983,896
19.03		Supply, Installation, Testing & Commissioning of 2x2 blinder matrix fixture with advanced COB LED technology light, 4 LEDs, Light Color: Single color warm white (3200K), Lifetime: Over 50,000 hours, Dimmer: 0-100% linearly adjustable, Beam Angle: 30 degree, Control mode: DMX512,Master/Slave, Auto Run, Sound active etc. all complete. Make:Canara Lighting / Selecon / Robe	8	No.		59,368.00	-	474,944
19.04		Supply, Installation, Testing & Commissioning of 4x 500W cyclorama light fittings with normal yoke, Lamp - 500W tungsten halogen with R7S base, Lamp Socket - Base R7s, berass tubular holder chromium plated, undergone through 7 Tank chemical treatment to keep them rust free and,black matt texture finish etc. all complete. Make:Desisti / ARRI / Canara lighting	5	No.		21,546.00	-	107,730
19.05		Supply, Installation, Testing & Commissioning of 1000W CE Certified halogen Fresnel spot light providing illumination of 28000 lix at 2 mt in spot at 10° beam angle while 4600 lix at 2 mt when operated in flood at 48° beam angle , dimension as 290 x 405 x 290mm, 150mm aid German lens, weight of 4.6Kg, Gx9.5 base lamp socket,power cord with 16amps 3 pin CE plug and normal yoke but without lamp and accessories etc. all complete. Make:Desisti / ARRI / Canara lighting	14	No.		17,658.00	-	247,212
19.60		Supply, Installation, Testing & Commissioning of 1000W spun aluminum PARCAN made out of spun aluminum 16 SWG in 2 piece cylindrical construction with punched slot on Par can housing for natural ventilation and floating ceramic GX16d base lamp socket,Yoke made of MS flat 25 X 3mm with 13mm free mounting hole to fit the adapter, spigot with 28mm and filter frame but without lamp etc. all complete. Make:Desisti / ARRI / Canara lighting	14	No.		5,200.00	-	72,800
19.07		Supply, Installation, Testing & Commissioning of 4- leaf barndoor with scrims for 1KW fresnel spot light, undergone through 7 Tank chemical treatment to keep them rust free and, duly powder coated in black matt texture finish etc. all complete. Make:Desisti / ARRI / Canara lighting	14	No.		1,806.00	-	25,284
							-	-

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
19.08		Supply, Installation, Testing & Commissioning of 4- leaf barndoor for LED PAR spot light, undergone through 7 Tank chemical treatment to keep them rust free and, duly powder coated in black matt texture finish etc. all complete. Make:Robe / Martin / Canara lighting	32	No.		1,678.00	-	53,696
							-	-
19.09		Supply, Installation, Testing & Commissioning of Diecast aluminum "C" clamp with safety locking chain, duly powder coated in black matt texture finish etc. all complete. Make:Desisti / ARRI / Canara lighting	87	No.		64.00	-	5,568
							-	-
19.10		Supply, Installation, Testing & Commissioning of Safety bond with lock clip to be fixed around the grid to avoid fall of the material in case if the "C" clamp is not locked properly . SWL 100Kgs etc. all complete. Make:Desisti / ARRI / Canara lighting	87	No.		64.00	-	5,568
							-	-
19.11		Supply, Installation, Testing & Commissioning of Grid mount photo isolator DMX splitter unit 1 DMX input and 8 isolated output with following specifications:Power Supply: 90-240V AC, 45-63Hz.Control: DMX 512 protocol,Control Signal input: 5 pin XLR female, etc. all complete.Make:Liteputer / ADB / Zero88	2	No.		57,555.00	-	115,110
							-	-
19.12		Supply, Installation, Testing & Commissioning of Rack mount 12 channel (12chx2.5KW) Dimmer pack, Automatic frequency sensor can detect power frequency (45Hz – 63Hz) in different areas & stabilizes the dimming output, Output can be limited from 50% to 100% for over load protection, intelligent thermo- protection will cease the output when over 85oC and restart output when below 65oC, Self testing function to test without a console, Each channel can be set as dimming or non-dimming, Control: DMX 512 protocol etc. all complete.Make:Liteputer / ADB / Zero88	4	No.		159,902.00	-	639,608
							-	-
19.13		Supply, Installation, Testing & Commissioning of Digital Lighting Console with 2048 dimmer, Fixture Library of more than 3,000 files, Over a hundred show files, Improved method of Fixture selection for Patching, 2048 Channels, 240 Intelligent Fixtures, 240 Dimmer Control Channels, Theatrical Plotting and Playback functions, 15 Playback Masters controlling 450 memories, chases or cue lists, MIDI and Bass, Mid, Treble sound to light triggers etc. all complete. Make:Liteputer / ADB / Zero88	1	No.		583,465.00	-	583,465
							-	-
19.14		Supply, Installation, Testing & Commissioning of MS Power junction box made up of 22SWG CRCA sheet of jindal make undergone through 7 tank process with various chemical treatment to keep them rust free, duly powder coated with Matt black texture finish 1 way 16A CEE Socket etc. all complete.	55	No.		1,150.00	-	63,250
							-	-
19.15		Supply, Installation, Testing & Commissioning of MS Power junction box made up of 22SWG CRCA sheet of jindal make 7 tank process with various chemical treatment to keep them rust free, duly powder coated with Matt black texture finish 4 way 16A CEE Socket etc. all complete.	19	No.		3,918.00	-	74,442
							-	-
19.16		Supply, Installation, Testing & Commissioning of MS Power junction box made up of 22SWG CRCA sheet of jindal make undergone through 7 tank process with various chemical treatment to keep them rust free, duly powder coated with Matt black texture finish 4 way 10A CEE Socket etc. all complete.	14	No.		901.00	-	12,614
							-	-
19.17		Supply, Installation, Testing & Commissioning of MS Signal junction box made up of 22SWG CRCA sheet of jindal make undergone through 7 tank process with various chemical treatment to keep them rust free, duly powder coated with Matt black texture finish 5 pin XLR DMX out connector etc. all complete.	14	No.		901.00	-	12,614
							-	-

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
19.18		Supply, Installation, Testing & Commissioning of MS Signal junction box made up of 22SWG CRCA sheet of jindal make undergone through 7 tank process with various chemical treatment to keep them rust free, duly powder coated with Matt black texture finish finish 5 pin XLR DMX in connector etc. all complete.	1	No.		3,585.00	-	3,585
							-	-
19.19		Supply, Installation, Testing & Commissioning of MS DMX lighting junction loop box made up of 22SWG CRCA sheet of jindal make undergone through 7 tank process with various chemical treatment to keep them rust free, duly powder coated with Matt black texture finish 5 pin XLR DMX in / out connector etc. all complete.	1	No.		3,585.00	-	3,585
							-	-
19.20		Supply, Installation, Testing & Commissioning of MS Auxilary fabricated marshalling boxes made up of 20SWG CRCA sheet undergone through 7 tank process with various chemical treatment to keep them rust free, duly powder coated with Matt black texture finish for all the light bar with required no of ivory connectors etc. all complete. Make:Canara Lighting / ABB / SCHNEIDER	1	No.		98,773.00	-	98,773
							-	-
19.21		Supply, Installation, Testing & Commissioning of MS fabricated 40 way power marshalling box made up of 20SWG CRCA sheet undergone through 7 tank process with various chemical treatment to keep them rust free, duly powder coated with Matt black texture finish ivory connect connectwell make and FC-11 nylon gland,Brass galnd suitable for power cable with proper earthing connector etc. all complete. Make:Canara Lighting / ABB / SCHNEIDER	2	No.		21,089.00	-	42,178
							-	-
19.22		Supply, Installation, Testing & Commissioning of Fabricated RACK for housing PDCP(with MCBP) and DIMMER modules etc. all complete. Make:Canara Lighting / ABB / SCHNEIDER	2	No.		58,347.00	-	116,694
							-	-
19.23		Supply, Installation, Testing & Commissioning of Well designed and engineered rack mount chocolate brown epoxy polyster coated type power distribution centre panel with necessary metering like voltmeter ammeter, Selector switch,indicators, outgoing feeders and 400amps main incomer L&T / SEIMENS make and emergency trip arrangement with shunt Release(PDCP-400) and MCB Panel rack mount internally wired to control individual Direct light points with suitable MCBs of L&T / SEIMENS make with proper erathing and suitable brss glands for outing power cables etc. all complete.Make:Canara Lighting / ABB / SCHNEIDER	1	No.		219,161.00	-	219,161
							-	-
19.24		Supply, Installation, Testing & Commissioning of MS Fabricated made up of 22SWG CRCA sheet of jindal make undergone through 7 tank process with various chemical treatment to keep them rust free, duly powder coated with Matt black texture finish power junction box (PJB) with black Matt texture finish to terminate the Motorized section power connections etc. all complete.Make:Canara Lighting / ABB / SCHNEIDER	12	No.		1,250.00	-	15,000
							-	-
19.25		Supply, Installation, Testing & Commissioning of Well designed and engineered Wall mount 10 feeder motor control centre panel with necessary meterings and contactors and relays to control motorised system (MCCP-10) etc. all complete. Make:Canara Lighting / ABB / SCHNEIDER	1	No.		92,354.00	-	92,354
							-	-
19.26		Supply, Installation, Testing & Commissioning of Well designed and engineered Wall mount 10 feeder Remote control panel with necessary meterings and contactors and relays to control the control motorised system.(RCP-10) etc. all complete.	1	No.		40,843.00	-	40,843
							-	-

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
19.27		Supply, Installation, Testing & Commissioning of Well designed and engineered Wall mount 2 feeder motor control centre panel / Remote control system with necessary meterings and contactors and relays to control motorised system (MCCP / RCP -2) etc. all Make:Canara Lighting / ABB / SCHNEIDERcomplete.	1	No.		33,342.00	-	33,342
						0.00	-	-
19.28		Supply, Installation, Testing & Commissioning of MS sheet metal fabricated emergency push button station undergone through 7 tank process with various chemical treatment to keep them rust free duly powder coated with Matt black texture finish for emergency trip etc. all complete. Make:Canara Lighting / ABB / SCHNEIDER	1	No.		1,834.00	-	1,834
							-	-
19.29		Supply, Installation, Testing & Commissioning of 1000W 230V single ended halogen lamp CP24 / CP70 Base Gx9.5 etc. all complete.Make:Philips / Osram	14	No.		2,642.00	-	36,988
							-	-
19.30		Supply, Installation, Testing & Commissioning of 1000W 230V Par-64 narrow / medium / wide lamps with base Gx16d for 1kW Halogen parcans etc. all complete. Make:Philips / Osram	14	No.		1,933.00	-	27,062
							-	-
19.31		Supply, Installation, Testing & Commissioning of Stage Furnishing System - Main Front Stage Curtain - Made out of velvet with horizontal / vertical sliding arrangement complete with fixing rails, brackets, sliding arrangement and Motorised operation complete with runners, master runners, pulleys, 3mm steel wire rope, one HP motors - 2 Nos., Air bracker contractors, 2 Nos. micro switches for auto stop, 3 Nos. push buttons for forward, reverse and stop positions, draped to half area when in closed position, minimum overlap at centre should be 900mm and should be stitched in double gathering with masking frill drop from prosc along with Motorised rail. with electric motor, Gear Box, running on bearings, switchable mode using Gear Box, railing System, Roller, Bearings, Relay, Limit Switch, Track etc. all complete. As approved by site incharge	1	No.		156,698.00	-	156,698
							-	-
19.32		Supply, Installation, Testing & Commissioning of Stage Furnishing System - Rear Stage Curtain - Made out of Glazzed Cotton / cashmilon with horizontal / vertical sliding arrangement complete with fixing rails, brackets, sliding arrangement and Motorised operation complete with runners, master runners, pulleys, 3mm steel wire rope, one HP motors - 2 Nos., Air bracker contractors, 2 Nos. micro switches for auto stop, 3 Nos. push buttons for forward, reverse and stop positions, draped to half area when in closed position, minimum overlap at centre should be 900mm and should be stitched in double gathering with masking frill drop from prosc along with Motorised rail. with electric motor, Gear Box, running on bearings, switchable mode using Gear Box, railing System, Roller, Bearings, Relay, Limit Switch, Track etc. all complete.As approved by site incharge	2	No.		138,864.00	-	277,728
							-	-
19.33		Supply, Installation, Testing & Commissioning of Stage Furnishing System - Main Side Wings - Made out of Glazzed Cotton / Cashmilon fixed on over head pivot track covered with Fabric Frame made up of 1"x2" MS Pipe etc. all complete.As approved by site incharge	8	No.		34,000.00	-	272,000
							-	-
19.34		Supply, Installation, Testing & Commissioning of Stage Furnishing System - Frills mounted on frill bar made out of double gathering glazzed cotton / casminlon to be fitted above the stage with 32mm dia GI Pipe to Cover the lights and other other stage ceiling Gadgets etc. all complete.As approved by site incharge	3	No.		2,848.00	-	8,544
							-	-
19.35		Supply, Installation, Testing & Commissioning of Stage Furnishing System - Side Ladder in Side Wings for Mounting Light Fixtures. Dimension: 2'x6'. Made up of with 1"x2" MS Pipe etc. all complete.As approved by site incharge	6	No.		14,000.00	-	84,000
19.36							-	-

S. No	DSR 2016 Code / MR	Item Description	Qty	Unit	DSR Rate	MR Rate	AMOUNT AS PER DSR 2016 (In Rs.)	AMOUNT AS PER MR (In Rs.)
		Supply, Installation, Testing & Commissioning of Stage Furnishing System - Main Lights Bars (Back, Center and FOH Light Bars) .made with 48mm GI pipe etc. all complete.	3	No.		46,280.00	-	138,840
19.37							-	-
		Supply, Installation, Testing & Commissioning of Stage Furnishing System - Cyclorama Screen with Frame - Screen Size 10x6 Mtr, Made of Matte White / High quality cinematographic material to be fixed on tubular frame 35mm dia. MS Pipe tied with rope / strings etc. all complete.As approved by site incharge	1	No.		140,672.00	-	140,672
							-	-
19.38		Supply, Installation, Testing & Commissioning of PVC Copper unarmoured flexible FRLS insulated multicore cable 1100V grade confirming to IS694 size 3cx2.5 sq mm etc. all complete.Make:Walan / SBEE / Polycab	2300	Meters		177	-	407,100
							-	-
19.39		Supply, Installation, Testing & Commissioning of PVC Copper unarmoured flexible FRLS insulated multicore cable 1100V grade confirming to IS694 size 12cx2.5 sq mm etc. all complete.Make:Walan / SBEE / Polycab	650	Meters		749	-	486,850
							-	-
19.40		Supply, Installation, Testing & Commissioning of FRLS PVC copper multistrand flexible cable 7 core x 1.5 sq.mm etc. all complete.Make:Walan / SBEE / Polycab	500	Meters		264	-	132,000
							-	-
19.41		Supply, Installation, Testing & Commissioning of PVC Copper unarmoured flexible FRLS insulated multicore cable 1100V grade confirming to IS694 size 24cx0.5sq mm etc. all complete. Make:Walan / SBEE / Polycab	60	Meters		367	-	22,020
							-	-
19.42		Supply, Installation, Testing & Commissioning of DMX signal cable for DMX network etc. all complete.Make:Falcon / Belden / Polycab	600	Meters		301	-	180,600
							-	-
19.43		Supply and laying of following size of M.S, Conduit pipe in recess including all accessories MS pull/junction boxes, GI fish wire of 6 SWG, fixing hardware etc., including cutting, chasing the walls/floor and plastering the chased portion and making good the damages etc., complete as required.						
	i	25 mm dia	1000	Mts	147		147,000	-
		TOTAL CARRIED TO SUMMARY					147,000	6,983,964
20.00		<u>SOLAR PHOTVOLTAIC POWER GENERATION</u>						
20.01		Design, Supply, installation, testing and commissioning of following capacity 3 phase 415 V grid interactive roof top solar photovoltaic power generation system including solar inverters (Make: Delta, Solis, Fronius), Data logger compatible to inverter, temperature and irradiance sensor (Make: Mahindra, IMT), AC Disconnecter Board, Cables, interconnections, chemical earthing, GI Strip, Lightning arresters etc. including all items required for its synchronization with grid and its synchronization with grid at LT Panel, complete as required in ready to use condition. liasion with authorities for subsidy, if any is also in the scope.						
	i	50KWp	2	Set		3,000,000		6,000,000
	ii	Extra for Design, Supply, installation, testing and commissioning of space frame (Module Mounting Structure) in M.S. for above 50KWp solar system including all necessary civil works in ready to use condition.	2	Set		500,000		1,000,000
		TOTAL CARRIED TO SUMMARY						7,000,000

SUMMARY OF COST

Name of Work: External Electrical works for All India Institute of Medical Sciences Campus (AIIMS) Mangalagiri at Guntur, A. P.

Sub Head: External Electrical Works

SL. NO.	SUB HEADS	AMOUNT AS PER DSR 2016	AMOUNT AS PER MR	AMOUNT AS DSR +MR
1	TRANSFORMERS :	-	41,806,378	41,806,378
2	HT PANEL	-	16,409,752	16,409,752
3	D.G. SETS & HSD TANK	-	69,459,990	69,459,990
4	HT CABLES	3,670,990	24,887,067	28,558,057
5	BUSDUCT	-	104,328,012	104,328,012
6	DISTRIBUTION BOARDS & PANELS:	-	27,920,896	27,920,896
7	MV CABLES, CABLE JOINTING & END TERMINATIONS	551,676	2,617,160	3,168,836
8	CABLE TRAYS	369,280	739,100	1,108,380
9	UPS	-	21,072,545	21,072,545
10	EARTHING	434,340	1,624,509	2,058,849
11	EXTERNAL LIGHTING & FEEDER PILLAR	1,509,730	17,177,222	18,686,952
12	IP CCTV SURVEILLANCE SYSTEMS	327,200	4,310,091	4,637,291
13	OUTDOOR PA SYSTEM	-	4,582,300	4,582,300
14	EPABX SYSTEM	-	30,159,758	30,159,758
15	BUILDING MANAGEMENT SYSTEM (BMS)	-	41,410,415	41,410,415
16	BOOM BARRIER SYSTEM	-	2,806,660	2,806,660
17	MISC. WORKS	5,814,280	5,015,966	10,830,246
18	SAFETY EQUIPMENTS	6,678	1,076,353	1,083,031
19	SPECIALIZED SERVICES OF AUDITORIUM	147,000	6,983,964	7,130,964
20	SOLAR PHOTVOLTAIC POWER GENERATION	-	7,000,000	7,000,000
	TOTAL			444,219,312

Project Name: External Electrical Works for AllIndia Institute of MedicalSciences (AIIMS) at MangalagiriDistt. Guntur (AP).

Summary Sheet

Note: Percentage should not quoted anywhere else except this summary page

Name of the Bidder						
Sr.No.	Particulars	Cost as per BOQ (in Rs.)	percentage above or below the estimated cost	% above or below in Figures	Percentage above or below in Words	Amount (in Rs.)
4	Electrical Works	444,219,312.00			Zero	0.00
Total Cost						0.00