DINING BLOCK AT IIT KANPUR					
ELECTRICAL WORKS BOQ					
S. No	**DESCRIPTION**	**UNIT**	**QTY**	**Rate**	**Amount in Rs (With GST@ 18%)**
1	**WIRING**				
1.1	Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS/HFFR PVC insulated copper conductor single core cable in surface/ recessed steel conduit, with modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm FRLS/HFFR PVC insulated copper conductor single core cable etc. as required.				
1.1.1	Group C	Point	705	2101	1481205
1.2	Wiring for group controlled (looped) light point/fan point/exhaust fan point/ call bell point (without independent switch etc.) with 1.5 sq. mm FRLS/HFFR PVC insulated copper conductor single core cable in surface/ recessed steel conduit, and earthing the point with 1.5 sq. mm FRLS/HFFR PVC insulated copper conductor single core cable etc. as required.				
1.2.1	Group C	Point	1290	1246	1607340
1.3	Wiring for circuit/ submain wiring along with earth wire with the following sizes of FRLS/HFFR PVC insulated copper conductor, single core cable in surface/ recessed medium class steel conduit as required.				
1.3.1	2 X 1.5 sq. mm + 1 X 1.5 sq. mm earth wire	Meter	2495	370	923150
1.3.2	2 X 2.5 sq. mm + 1 X 2.5 sq. mm earth wire	Meter	594	414	245916
1.3.3	2 X 4 sq. mm + 1 X 4 sq. mm earth wire	Meter	4396	476	2092496
1.3.4	2 X 6 sq. mm + 1 X 6 sq. mm earth wire	Meter	330	652	215160
1.3.5	4 X 1.5 sq. mm + 2 X 1.5 sq. mm earth wire	Meter	1871	363	679173
1.3.6	4 X 2.5 sq. mm + 2 X 2.5 sq. mm earth wire	Meter	446	621	276966
1.3.7	4 X 4 sq. mm + 2 X 4 sq. mm earth wire	Meter	3417	744	2542248
1.3.8	4 X 6 sq. mm + 2 X 6 sq. mm earth wire	Meter	338	1001	338338
1.3.9	4 X 10 sq. mm + 2 X 6 sq. mm earth wire	Meter	105	1253	131565
1.3.10	4 X 16 sq. mm + 2 X 6 sq. mm earth wire	Meter	30	1760	52800
1.4	Supplying and drawing following sizes of FRLS/HFFR PVC insulated copper conductor, single core cable in the existing surface/ recessed steel/ PVC conduit as required.				
1.4.1	3 x 1.5 sq. mm	Meter	450	104	46800
1.4.2	3 x 2.5 sq. mm	Meter	150	148	22200
1.5	Supplying and fixing of following sizes of steel conduit along with 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.				
1.5.1	20 mm	Meter	350	254	88900
1.5.2	25 mm	Meter	800	289	231200
1.5.3	32 mm	Meter	250	360	90000
1.5.4	40 mm	Meter	80	515	41200
1.6	Supplying and fixing metal box of following sizes (nominal size) on surface or in recess with suitable size of phenolic laminated sheet cover in front including painting etc. as required.				
1.6.1	100 mm X 100 mm X 60 mm deep	Each	50	245	12250
1.6.2	150 mm X 150 mm X 60 mm deep	Each	30	360	10800
1.6.3	250 mm X 300 mm X 60 mm deep	Each	10	673	6730
1.7	Supplying and fixing modular blanking plate on the existing modular plate & switch box excluding modular plate as required.	Each	50	47	2350
1.8	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 3 pin 5/6 A modular socket outlet and 5/6 A modular switch, connections etc. as required.	Each	90	545	49050
1.9	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providng and fixing 2 Nos. 3 pin 5/6 A modular socket outlet and 2 Nos. 5/6 A modular switch, connections etc. as required. (For light plugs to be used in non residential buildings).	Each	41	757	31037
1.10	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 6 pin 5/6 A & 15/16 A modular socket outlet and 15/16 A modular switch, connections etc. as required.	Each	167	659	110053
1.11	Supplying and drawing co-axial TV cable RG-6 grade, 0.7 mm solid copper conductor PE insulated, shielded with fine tinned copper braid and protected with PVC sheath in the existing surface/ recessed steel/ PVC conduit as required.	Meter	231	54	12474
1.12	Supplying and fixing following modular switch/ socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required.				
1.12.1	TV antenna socket outlet	Each	8	168	1344
1.13	Supplying and fixing following size/ modules, GI box alongwith modular base & cover plate for modular switches in recess etc. as required.				
1.13.1	1 or 2 Module (75 mmX75 mm)	Each	99	354	35046
2	**DISTRIBUTION BOARDS**				
2.1	Supplying and fixing following way, single pole and neutral, sheet steel, MCB distribution board, 240 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator)				
2.1.1	8 way, Double door	Each	2	2773	5546
2.1.2	12 way, Double door	Each	5	2871	14355
2.1.3	16 way, Double door	Each	2	3367	6734
2.2	Supplying and fixing following way, horizontal type three pole and neutral, sheet steel, MCB distribution board, 415 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator).				
2.2.1	8 way (4 + 24), Double door	Each	9	6337	57033
2.2.2	12 way (4 + 36), Double door	Each	10	8705	87050
2.3	Design, fabrication, assembling, wiring, supply, installation, testing & commissioning of VTPN type Distribution boards conforming to IS: 8623-1 & 3 suitable for MCCB incomer, made out of pre-treated and powder coated (minimum 60-80 micron), minimum 1.2mm thick sheet steel double door enclosure (IK 09), 500 V, mount on surface / recess, complete with centrally mount minimum 250A rated tinned copper insulated three phase busbar, common neutral bus bar, common earth bar, din bar including earthing stud etc. as required. The cost shall also include required blanking Plates, sticking saddles, cement spill protector, cable ties, circuit identification labels & laminated DB Detail chart as standard or as suggested by Architect/Consultant. (But without MCCB/MCB/RCCB/Isolator). (Note : Vertical type MCCB TPDB is normally used where 3 phase outlets are required.)				
2.3.1	8 way (4 + 24), Double door	Each	3	14252	42756
2.4	Supplying and fixing 5 A to 32 A rating, 240/415 V, 10 kA, "C" curve, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
2.4.1	Single pole	Each	591	285	168435

S. No	DESCRIPTION	UNIT	QTY	Rate	Amount in Rs (With GST@ 18%)
2.4.2	Double pole	Each	10	696	6960
2.4.3	Triple pole	Each	17	1070	18190
2.4.4	Four Pole	Each	20	1737	34740
2.5	Supplying and fixing single pole blanking plate in the existing MCB DB complete etc. as required	Each	46	14	644
2.6	Supplying and fixing 40 A to 63 A rating, 240/415 V, 10 kA, “C” curve, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
2.6.1	Four Pole	Each	20	2430	48600
2.6.2	Triple Pole	Each	2	1305	2610
2.7	Supplying and fixing following rating, double pole, (single phase and neutral), 240 V, residual current circuit breaker (RCCB), having a sensitivity current 30 mA in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
2.7.1	25 A	Each	30	2141	64230
2.7.2	40 A	Each	30	2512	75360
2.7.3	63 A	Each	3	2866	8598
2.8	Supplying and fixing following rating, four pole, (three phase and neutral), 415 volts, residual current circuit breaker (RCCB), having a sensitivity current 30 mA in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
2.8.1	63 A	Each	4	3597	14388
2.9	Supplying and fixing Cable End Box (Loose Wire Box) suitable for following single pole and neutral, sheet steel, MCB distribution board, 240 Volts, on surface/ recess, complete with testing and commissioning etc. as required.				
2.9.1	For 8 way, Double door SPN MCBDB	Each	2	918	1836
2.9.2	For 14 way, Double door SPN MCBDB	Each	7	990	6930
2.10	Supplying and fixing Cable End Box (Loose Wire Box) suitable for following triple pole and neutral, sheet steel, MCB distribution board, 415 Volts, on surface/ recess, complete with testing and commissioning etc.as required.				
2.10.1	For 8 way, Double door TPN MCBDB	Each	9	1448	13032
2.10.2	For 12 way, Double door TPN MCBDB	Each	10	3125	31250
2.11	Supplying and fixing 30 A, 240 V, SPN Industrial type socket outlet, with 2 pole and earth, metal enclosed plug top along with 30 A "C" curve, SP, MCB, in sheet steel enclosure, on surface or in recess, with chained metal cover for the socket out let and complete with connections, testing and commissioning etc. as required.	Each	22	4160	91520
2.12	Supplying and fixing 20 A, 240 V, SPN Industrial type socket outlet, with 2 pole and earth, metal enclosed plug top along with 20 A "C" curve, SP, MCB, in sheet steel enclosure, on surface or in recess, with chained metal cover for the socket out let and complete with connections, testing and commissioning etc. as required.	Each	2	1806	3612
2.13	Supplying and fixing 20 A, 415 V, TPN Industrial type socket outlet, with 4 pole and earth, metal enclosed plug top along with 20 A "C" curve, TPMCB, in sheet steel enclosure, on surface or in recess, with chained metal cover for the socket out let and complete with connections, testing and commissioning etc. as required.	Each	8	2773	22184
2.14	Supplying and fixing 30 A, 415 V, TPN Industrial type socket outlet, with 4 pole and earth, metal enclosed plug top along with 30 A "C" curve, TPMCB, in sheet steel enclosure, on surface or in recess, with chained metal cover for the socket out let and complete with connections, testing and commissioning etc. as required.	Each	6	4358	26148
2.15	Providing and fixing following rating and breaking capacity and pole MCCB with thermomagnetic release and terminal spreaders in existing cubicle panel board including drilling holes in cubicle panel, making connections, Ics=100% Icu and Operational Voltage 690V etc. as required.				
2.15.1	100 A, 16 kA,TPMCCB (For VTPN DB Incomer Breaker)	Each	3	4003	12009
2.15.2	100 A, 30kA, FPMCCB (For Kitchen Equipment in enclosure)	Each	7	8127	56889
2.16	Design, fabrication, assembling, wiring, supply, installation, testing & commissioning of (IP:30, IK 08) minimum 1.2mm thick sheet steel FP/DP RCCB/MCB enclosure made out of pre-treated and powder coated (minimum 60-80 micron), 240/415 V, mount on surface / recess, complete with din bar including earthing stud etc. as standard or as suggested by Architect/Consultant. (For Lift & Kitchen Equipment)	Each	23	874	20102
2.17	Design, fabrication, assembling, wiring, supply, installation, testing & commissioning of (IP:30) minimum 1.2mm thick sheet steel FP MCCB enclosure made out of pre-treated and powder coated (minimum 60-80 micron), 240/415 V, mount on surface / recess, complete with din bar including earthing stud etc. as standard or as suggested by Architect/Consultant. (For Kitchen Equipment)	Each	7	1925	13475
3	**SUPPLY OF LIGHT FIXTURES AND FANS**				
	Note:-The model numbers specified below are only for references for Shape of the product requirement. The product shall supplied, must match the technical specifications. The technical data sheets shall be arranged before the material dispatch and got approved from engineer-in- charge.				
3.1	Supply of SMD LED, IP 40, 12W Recessed downlighter with System efficacy of 100lm/W and system lumen output 1200 lumen, operating in an ambient temperatire of 0ºC to 45ºC at 50Hz frequency. Luminaire shall have aluminium pressure die cast housing in white with high transmittivity diffuser for uniform illumination and reduced glare. EMC/PCT package of wattage of 0.5-1 W LEDs used in the product shall comply with IEC 62471 for Photo-biological safety. LM 80-08 compliant LEDs from reputed makes such as Nichia/Cree/ Bridgelux/ Lumiled/ Osram/Seoul should be provided. The LED shall comply with L70 life of 50000 burning hours tested at maximum current. The LEDs used should be with CCT of 5700 K and CRI of Minimum 80, with MacAdam CCT binning <3 mounted on 1.6mm MCPCB/FR4 with 35 micron cu layer. LED Driver shall be external, Isolated type, Constant Current topology driver with proper heat sink for heat dissipation suitable to operate at nominal rated voltage of 240V with 4kV internal surge protection, Power factor of minimum 0.95, driver efficacy of minimum 85%, and total harmonic distortion (THD) of less than or equal to 10% should be integral to the luminaire. Manufacturer shall have inhouse lab approved by NABL or ministry of science of govt of India. LM 79 and LM80 reports need to be submitted from a NABL/UL accredited lab to verify above parameters. Compliance to Indian Standards of IS10322 Part 5 / Sect 5:1967; 16105 : 2012; IS 16106 : 2012; IS 15885 (Part2/Sec13) : 2012; IS 16108 : 2012.	Each	169	1177	198913
3.2	Supply of SMD LED, IP 40, 18W Recessed downlighter with System efficacy of 100lm/W and system lumen output 1800 lumen, operating in an ambient temperatire of 0ºC to 45ºC at 50Hz frequency. Luminaire shall have aluminium pressure die cast housing in white with high transmittivity diffuser for uniform illumination and reduced glare. EMC/PCT package of wattage of 0.5-1 W LEDs used in the product shall comply with IEC 62471 for Photo-biological safety. LM 80-08 compliant LEDs from reputed makes such as Nichia/Cree/ Bridgelux/ Lumiled/ Osram/Seoul should be provided. The LED shall comply with L70 life of 50000 burning hours tested at maximum current. The LEDs used should be with CCT of 5700 K and CRI of Minimum 80, with MacAdam CCT binning <3 mounted on 1.6mm MCPCB/FR4 with 35 micron cu layer. LED Driver shall be external, Isolated type, Constant Current topology driver with proper heat sink for heat dissipation suitable to operate at nominal rated voltage of 240V with 4kV internal surge protection, Power factor of minimum 0.95, driver efficacy of minimum 85%, and total harmonic distortion (THD) of less than or equal to 10% should be integral to the luminaire. Manufacturer shall have inhouse lab approved by NABL or ministry of science of govt of India. LM 79 and LM80 reports need to be submitted from a NABL/UL accredited lab to verify above parameters. Compliance to Indian Standards of IS10322 Part 5 / Sect 5:1967; 16105 : 2012; IS 16106 : 2012; IS 15885 (Part2/Sec13) : 2012; IS 16108 : 2012	Each	1213	1495	1813435

S. No	DESCRIPTION	UNIT	QTY	Rate	Amount in Rs (With GST@ 18%)
3.3	Supply of 4 feet, ceiling or wall mounted, SMD LED batten of 40W LED luminaire with System efficacy of 120 lm/W and 5000 system lumens, operating in ambient temperature of 0ºC to 45ºC . Luminaire shall be made up of extruded anodised aluminium housing with polycarbonate high transmissivity diffuser, ensuring uniform illumination glare free lighting, excellent heat dissipation, high durability, scratch resistance and non-rusting features. LEDs used in the product complies with IEC 62471 for Photo-biological safety. With screwless design, luminaire is with IP40. LM 80-08 compliant LEDs from reputed makes such as Nichia/Cree/ Bridgelux/ Lumiled/ Osram/Seoul should be provided. The LED shall comply with L70 life of 50000 burning hours tested at maximum current .The LEDs used shall be with CCT of 5700 K and CRI of minimum 80, with MacAdam CCT binning < 3. Luminaire shall have MCPCB and its LED Driver shall be of Integrated type prewired in product housing, Isolated, Constant Current with range 150-270V AC with internal surge protection of 2.5kV. Driver of Efficiency > 85%, Power factor of minimum 0.95 and total harmonic distortion (THD) of less than or equal to 10% shall be integral to the luminaire. Manufacturer shall have inhouse lab approved by NABL or ministry of science of govt of India. LM 79 and LM80 reports need to be submitted from a NABL/UL accredited lab to verify above parameters. Compliance to Indian Standards of IS10322 Part 5 / Sect 5:1967; 16105 : 2012; IS 16106 : 2012; IS 15885 (Part2/Sec13) : 2012; IS 16108 : 2012. Approximate Luminaire Weight : 0.36kg	Each	26	2166	56316
3.4	Supply of 10W Wall mounted LED Bulkhead Light delivering minimum system lumen of 1000 lm & the luminaire shall be with system efficacy ≥ 100 lm / W. Housing & Rim is Pressure Die Cast Aluminium, powder coated white , IP65, IK08, Optics: Polycarbonate Opal Diffuser. The operating CCT shall be 5700K with CRI of ≥80. The luminaire shall be BIS Registered with electronic driver with input voltage range of 140 to 280V , THD ≤ 10% & PF ≥ 0.95, 50,000 Hrs LED Life with L70 Criteria. Shall have minimum surge protection of 2.5KV. The LED Driver shall be easily avaiable in India for repair and service. The LED shall be SMD type.The luminaire shall be with following certifications: LM79 & LM80 issued by LED manufacturer along with Photo Biological Safety Standard	Each	35	1730	60550
3.5	Supply of 10W ,2ft Linear Batten LED luminaire delivering an initial system lumen of 1000 lumens & the luminaire shall be with system efficacy ≥ 100 lm / W. The luminaire Housing shall be made of extruded Polycarbonate & the diffuser shall be of polycarbonate. The operating CCT shall be 6500K with CRI of ≥80. The luminaire shall be BIS Registered with electronic driver with input voltage range of 150 to 270V , THD ≤ 20% & PF ≥ 0.9 , 50,000 Hrs LED Life with L70 Criteria, IP20. The LED Driver shall be easily avaiable in India for repair and service. Luminaire shall have minimum surge protection of 2.5 KV.The luminaire shall be with following certifications: LM79 & LM80 issued by LED manufacture along with Photo Biological Safety Standard	Each	26	450	11700
3.6	Supply of 4 feet surface mounted SMD LED batten of 40W LED fixture with System efficacy of 100 lm/W and 4000 system lumens, operating in ambient temperature of -20ºC to 45ºC . Luminaire shall be made up of co-extruded polycarbonate white housing with polycarbonate UV stabilized high transmissivity co-extruded diffuser, ensuring uniform illumination glare free lighting, excellent heat dissipation, high durability, scratch resistance and very light weight with non-rusting features. LEDs used in the product complies with IEC 62471 for Photo-biological safety. Luminaire is with IP66 and IK10 protection with stainless steel mounting clamps. LM 80-08 compliant LEDs from reputed makes such as Nichia/Cree/ Bridgelux/ Lumiled/ Osram/Seoul should be provided. The LED shall comply with L70 life of 50000 burning hours tested at maximum current .The LEDs used shall be with CCT of 5700 K and CRI of minimum 80. LED Driver shall be of Integrated type prewired in product housing, Isolated, Constant Current with range 150-270V AC with internal surge protection of 3kV. Driver of Efficiency > 85%, Power factor of minimum 0.95 and total harmonic distortion (THD) of less than or equal to 10% shall be integral to the luminaire. Manufacturer shall have inhouse lab approved by NABL or ministry of science of govt of India. LM 79 and LM80 reports need to be submitted from a NABL/UL accredited lab to verify above parameters. Compliance to Indian Standards of IS10322 Part 5 / Sect 5:1967; 16105 : 2012; IS 16106 : 2012; IS 15885 (Part2/Sec13) : 2012; IS 16108 : 2012.	Each	4	4949	19796
3.7	Supply of 12W Surface mounted IP40 LED Circular Down lighter luminaire with system lumen output ≥1200 lm. Luminaire shall be made up of die cast aluminium housing . Luminaire shall have Optical Grade High Efficiency Translucent Optical compartment for very high efficiency.Optical compartment shall have Unique HET diffuser for wider and uniform distribution. LM 80-08 compliant, ANSI rated LEDs from reputed makes such as Nichia, Japan / Cree, USA / Bridge lux, USA / Lumiled USA / Ever light should be provided. Luminaire shall use multiple LEDs of less than 1W Class for better diffusion and heat management. LEDs must be driven at 70% of maximum rated current for higher reliability in all our products. The LED shall be compliant with LM80-08 standard with Useful L70 life of 50000 Hrs. (Complete LM 80 test report for LED should be submitted). The LEDs used in luminaire should be ANSI standard Rated LED with CCT of 5700K and CRI of Minimum 80. LEDs used must be tested as per EN62471 for Photo Biological Safety of humans and Report of the same from LED Manufacturer shall be submitted. Isolated type, multistage Constant Current topology driver suitable to operate in input voltage range of 140V to 270V (nominal rated voltage – 240V) with minimum 4KV surge protection. The driver should have efficiency of ≥85% with Power factor ≥ 0.95 and I THD of ≤ 10% should be integral to the luminaire. Driver shall be made in India for better service and availability. Driver output voltage shall be less than SELV limits for safe DC operation and maintenance. LM79 Test Report from Third Party NABL Lab to be submitted in the event of order to confirm above parameters	Each	88	2049	180312
3.8	Supply of 4 feet surface mounted SMD LED batten of 40W LED fixture with System efficacy of 100 lm/W and 4000 system lumens, operating in ambient temperature of 0ºC to 45ºC . Luminaire shall be made up of co-extruded polycarbonate white housing with polycarbonate UV stabilized high transmissivity co-extruded diffuser, ensuring uniform illumination glare free lighting, excellent heat dissipation, high durability, scratch resistance and very light weight with non-rusting features. LEDs used in the product complies with IEC 62471 for Photo-biological safety. Luminaire is with IP66 and IK10 protection with stainless steel mounting clamps. LM 80-08 compliant LEDs from reputed makes such as Nichia/Cree/ Bridgelux/ Lumiled/ Osram/Seoul should be provided. The LED shall comply with L70 life of 50000 burning hours tested at maximum current .The LEDs used shall be with CCT of 5700 K and CRI of minimum 80, with MacAdam CCT binning < 4. LED Driver shall be of Integrated type prewired in product housing, Isolated, Constant Current with range 150-260V AC with internal surge protection of 4kV. Driver of Efficiency > 85%, Power factor of minimum 0.95 and total harmonic distortion (THD) of less than or equal to 10% shall be integral to the luminaire. Manufacturer shall have inhouse lab approved by NABL or ministry of science of govt of India. LM 79 and LM80 reports need to be submitted from a NABL/UL accredited lab to verify above parameters. Compliance to Indian Standards of IS10322 Part 5 / Sect 5:1967; 16105 : 2012; IS 16106 : 2012; IS 15885 (Part2/Sec13) : 2012; IS 16108 : 2012.	Each	62	3987	247194
3.9	Supply, Installation, Test & Commissioning of 35W LED Decorative Post Top type luminaire with System efficacy of 90 lm/W (3150 lumens), suitable for external poles of dia. 65mm to 75mm. Luminaire shall be made up of pure polyster power coated RAL7021 pressure die cast Aluminium housing with HET PMMA Diffuser . All external hardwaremust be of SS304 grade. LM 80-08 compliant LEDs of EMC/ceramic package from reputed makes such as Nichia/Cree/ Bridgelux/ Lumiled/ Osram/Seoul should be provided. LEDs used in the product shall comply with EN 62471 for Photo-biological safety and certificate for the same from manufacturer shall be provided. Luminaire shall be with IP65 and IK04 protection. The LED shall be compliant with LM80-08 standard with L70 life of 50000 Hrs tested at maximum current (Complete LM 80 test report for LED should be submitted for 10000 hrs of testing). The LEDs used should be with CCT of 5700 K, CRI of Minimum 70 and SDCM <5. LEDs must be driven at max 70% of the rated current. MCPCB with Aluminium core and copper thickeness of 35 micron to be used for LED mounting.LED Driver shall be silicone potted, Integrated type, Isolated, Constant Current with range 150-270V AC. Driver Efficiency > 85% & 4 KV internal surge protection , Power factor greater than 0.95 and total harmonic distortion (THD) of less than 10% should be integral to the luminaire. Manufacturer shall have inhouse lab approved by NABL or ministry of science of govt of India. LM79 and LM80 reports need to be submitted from a NABL/UL accredited lab to verify above parameters. Compliance to Indian Standards of IS10322 Part 5 / Sect 5:1967; 16105 : 2012; IS 16106 : 2012; IS 15885 (Part2/Sec13) : 2012; IS 16108 : 2012 should be there.	Each	7	7703	53921
3.10	Supply, Installation, Testing and Commissioning of LED strip light, 5W/ mtr system wattage (±10%) having minimum system lumen output of 375 lumens (±10%), operating on rated voltage of 240V AC with input voltage range of 100–300V AC, power factor ≥0.90 and current THD ≤20% at full load. The luminaire shall have external driver with minimum 85% efficiency at full load and rated voltage, suitable for surface mounting arrangement.The LED strip shall be mounted on polyimide double sided PCB with surface mount LED configuration, colour temperature of 4000K with ANSI C78.377A binning compliance and LED life of minimum 35,000 hours at L70 criterion.The luminaire shall conform to IEC 62471 for photobiological safety, be classified as Electrical Insulation Class I, suitable for ambient operating temperature of 0–45°C, with IP20 protection. Surge protection shall be minimum 3 kV. Complete in all respects including driver, mounting accessories, testing and commissioning as required	Meter	330	2421	798930

S. No	DESCRIPTION	UNIT	QTY	Rate	Amount in Rs (With GST@ 18%)
3.11	Supply, Installation, Testing and Commissioning of 70W SMD LED Streetlight fixture with System efficacy of 130 lm/W (9100 lumens). Luminaire shall be made up of pure polyster powder coated die cast Aluminium housing with high purity IP66 lens without any glass cover, of same make. The housing should be made of LM6/ADC12 Alloy, non-corrosive Single Piece pressure die-cast aluminum, to withstand extreme environments. All external hardware must be of SS304 grade. The name of the brand should be embossed/engraved & should not be mentioned using sticker/screen printing. Luminaire shall be designed with street optic LENS for uniform light distribution. Maximum LENS dome top temperature shall be less than 95°C at 45°C ambient temperature. LM 80-08 compliant LEDs of EMC/ceramic package of wattage of 3W-5W from reputed makes such as Nichia/Cree/ Bridgelux/ Maxlux/ Lumiled/ Osram/Seoul should be provided. LEDs used in the product shall comply with EN 62471 for Photo-biological safety and certificate for the same from manufacturer shall be provided. Luminaire shall be with IP66 and IK10 protection. The LED shall be compliant with LM80-08 standard with L70 life of 1,00,000 Hrs tested at maximum current (Complete LM 80 test report for LED should be submitted for 10000 hrs of testing). The LEDs used should be with CCT of 5700 K, CRI of Minimum 70 and SDCM of < 5. LEDs must be driven at max 70% of the rated current. MCPCB with Aluminium core and copper thickeness of 35 micron to be used for LED mounting. LED Driver shall be silicone potted, Integrated type, Isolated, Constant Current with range 140-270V AC. Driver Efficiency > 85% & 5 KV internal surge protection with external surge protection of additional 10KV, Power factor greater than 0.95 and total harmonic distortion (THD) of less than 10% should be integral to the luminaire. LED Driver must have short circuit, open circuit, Auto cut-off protection for low and high input voltage. Driver must be of die cast / extruded Aluminium casing. Manufacturer shall have inhouse lab approved by NABL or ministry of science of govt of India. LM 79 and LM80 reports need to be submitted from a NABL/UL accredited lab to verify above parameters. Compliance to Indian Standards of IS10322 Part 5 / Sect 3:2013; 16105 : 2012; IS 16106 : 2012; IS 15885 (Part2/Sec13) : 2012; IS 16108 : 2012.	Each	12	6075	72900
3.12	Design, Manufacture,Transport to the site of 7.5 mt high, min dia 135 mm at bottom and 70 mm at top hot dipped galvanised (120 GSM) octagonal pole including Single over hang 1.0 meter long Street light pole bracket made of 3 mm thick steel plate with single longitudenal welding designed to withstand wind speed of min. 169 KM /hrs having baseplate 310x310x16mm, window section and flush cover with locking arrangement at 600 mm height for cable termination block, including strengthtening of cable termination block making arrangement for cable termination and template and anchor plate 300x300x3mm ,with 4 nos 750 mm long 24 mm dia foundation bolts (EN8 grade) each with 2Nos. G.I. nuts washer. Provide necessary window with door and lock at min. 600 m with din rail for provided 4 pole 40 amp heavy duty terminals, 10A SP MCB with central overload trip mechanism and flag indication and 3 core 1.5 sqmm cu flexible cable between MCB with central overload trip mechanism and flag indication to each light on top, gland plate for cable termination and earthing stud with Single over hang 1.0 meter long Street light pole. bracket Note: The foundation Bolts and Holes shall be as per the pole manufecturer's instructions.	Each	12	25678	308136
3.13	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.				
3.13.1	Above 6.5 meter and upto 8.0 meter	Each	12	7178	86136
3.14	Supplying and embedding following dia G.I. pipe (medium class) in pole collar/ foundation (during casting) for cable entry including bending the pipe to the required shape complete as required. (For Gate Light)				
3.14.1	40 mm dia	meter	7	626	4382
3.15	Supply, Installation, Testing and Commissioning of LED aviation light with Die-cast aluminum housing with Red polycarbonate dome for better illumination, Integral driver, IP:65, Features and Benefits Protection against short-circuit. Protection against surge. Wide operating input voltage range 150 – 270VAC. lumen maintainence of 70% at the end of 50000 burning hours.	Each	2	5282	10564
3.16	Supply, Installation, Testing and Commissioning of 3W LED Unidirectional Exit Signage Light with inbuilt 2hours battery back up .	Each	26	5136	133536
3.17	**Brush Less Direct Current (BLDC) Fan with Remote**				
	Supply, Installation, Testing and Commissioning of ceiling fan with Brush Less Direct Current (BLDC) Motor, class of insulation: B, 3 nos. metal(Aluminium alloy) blades, 30 cm long down rod, 2 nos. canopies, shackle kit, safety rope, copper winding, steel/Al body. Power Factor not less than 0.9, Service Value (CM/M/W) minimum as below, 350 RPM (tolerance as per IS : 374-2019), THD (Total Harmonic Distortion) less than 10%, remote (preferably mobile app based) for speed control and all remaining accessories including safety pin, nut bolts, washers, temperature rise=75 0C (max.), insulation resistance more than 2 mega ohm, suitable for 230 V, 50 Hz, single phase AC supply Ceiling Fan compliant to IS 374:2019 fan i/c external connections with 1.5 sq.mm FRLS/HFFR, PVC insulated copper conductor single core cable and earthing etc. as required.				
3.17.1	1200mm, service value ≥ 6.0 CM/Min/Watt, air delivery 210 CM/Min (Minimum)	Each	402	2882	1158564
4	**INSTALLATIONS OF LIGHT FIXTURES AND FANS**				
1	Installation, Testing and Commissioning of pre-wired, fluorescent fitting / compact fluorescent/ LED fitting of all types, complete with all accessories and tube/lamp etc. directly on ceiling/ wall, including connections with 1.5 sq. mm FRLS/HFFR PVC insulated, copper conductor, single core cable and earthing etc. as required.	Each	1649	259	427091
2	Numbering of ceiling fan/ exhaust fan/ fluorescent fittings as required.	Each	2070	72	149040
3	Installation, Testing and Commissioning of ceiling fan, including wiring the down rods of standard length (upto 30 cm) with 1.5 sq. mm FRLS/HFFR PVC insulated, copper conductor, single core cable etc. as required.	Each	402	266	106932
5	**LIGHTNING CONDUCTOR**				
	AS PER IEC 62305 / NBC 2016 AT LVL -III				
5.1	Supply and fixing of Vertical Aluminium Lighting Arrester of 10/16 MM dia, 2000 mm long complete as required.	Nos.	12	3599	43188
5.2	Supply and fixing of 8mm dia Aluminium alloy Solid Round Conductor of material AlMgSi used in air termination system . Cross sectional area of conductor should be 50 mm² complete as required. (Horizontal run)	Mtr.	402	291	116982
5.3	Supply and fixing of Parapet conductor holder for 8 mm round aluminium conductor holder made of SS 304 for horizontal installation at the roof The distance between each holder should be min of 1 mtr to meet the requirements of IS/IEC 62305 & IEC 62561 2 complete as required.	Nos.	402	180	72360
5.4	Supply and fixing of Nylon roof conductor holder for flat roof with concrete block for fixing 8 mm dia Aluminium alloy Solid Round Conductor in the terrace flat surface at every 1 mtr complete as required.	Nos.	30	318	9540
5.5	Supply and fixing of Nylon Conductor Holder for Parapet wall for holding 8 mm dia Aluminium alloy round Conductor complete as required.	Nos	402	76	30552
5.6	Supply and fixing of Cross connector for connecting of 8 mm Al round conductor . The connector should be of SS 304 with SS nuts and bolt to meet the requirements of IS/IEC 62305 & IEC 62561 2 complete as required.	Nos.	40	277	11080
5.7	Supply and fixing of Expansion Joint with connector to compensate the expansion and contraction of Solid Round Al. Conductor during temperature variations. Expansion Joint should be consider at every 20 mtr length of straight horizontal air termination and connected at both the end with use of straight connector conductor complete as required.	Nos.	20	678	13560
5.8	Supply and fixing of adhesive glue suitable for adhesive-type holders (Lord Make) for metal roof complete as required.	Nos.	1	6921	6921
5.9	Supply and fixing of Glue dispenser complete as required.	Nos.	1	20764	20764

S. No	DESCRIPTION	UNIT	QTY	Rate	Amount in Rs (With GST@ 18%)
5.10	Supply and fixing of 8mm dia Aluminium alloy Solid Round Conductor of material AlMgSi used in air termination system . Cross sectional area of conductor should be 50 mm² complete as required.	Mtr.	248	457	113336
5.11	Supply and fixing of Parapet conductor holder for 8 mm round aluminium conductor holder made of SS 304 for horizontal installation at the roof The distance between each holder should be min of 1 mtr to meet the requirements of IS/IEC 62305 & IEC 62561 2 complete as required.	Nos.	248	194	48112
5.12	Supply and fixing of SS straight connector for connecting of 8 mm Al round conductor. The connector should be of SS with SS nuts and bolt complete as required.	Nos.	55	277	15235
5.13	Supply,installation, testing and comissioning of a lightning strike counter I FLASH REPORT or equivalent on the down-conductor. The unit should be compliant to the IEC 62561-6. The counter should be able to register the lightning events from 1 kA to 100kA and should be able to register the date, the hour and the intensity of the lightning event. The counter should be able to communicate lightning events to the concerned person via bluetooth transmission to the smartphone. Its corresponding app should be available on Android and Apple App stores.The counter should be at least with the index protection IP67 complete as required.	Nos.	1	55440	55440
5.14	Supply and fixing of SS Test Joint for connecting 8mm AL witre to strip & 10mm CB Wire complete as required.	Nos.	15	374	5610
5.15	Supply and fixing of PVC Test Joint with enclosure to interconnect between 8 mm Al. round conductor to 10 mm copper bonded round conductor complete as required.	Nos.	17	1730	29410
5.16	Supply,installation, testing and comissioning of advance chemical gel earthing system for the proper dissipation of fault / leakage current to the ground and ensure the continuous electrical connectivity and proper functioning to the electrical system. The earth rod shall be of UL listed & CPRI tested 3 meter long 14 mm dia 250 microns copper bonded steel rod with the connecting clamp (ss - rod to tape). The UL listed copper bonded rod also should be tested & ceritifed from CPRI for a short circuit current of 46 KA or more. To ensure the electrical conductivity, 50 Kgs Uniearth GEC (Ground Enhancing Compound per pit) or more resistance grounding minerals per earth pit / earth rod shall be used along with the copper bonded rod. As per IEEE 80-2013 (Clause 14.5 d), The grounding minerals should be ROHS certified to ensure it does not pollute the ground water as per technical specification attached complete as required.	Nos.	17	10382	176494
5.17	Supply and fixing of Bridging cable for ecopotential bonding complete as required.	Nos.	10	457	4570
5.18	Supply and fixing of Rust resistant non corossive 10 mm dia Copper Bonded Steel round conductor used for Earth termination inside the concrete and soil for connecting 8mm AL wire down conductor. Earthing connections using Copper Bonded (CB) wire shall be carried out by exothermic welding to ensure a permanent, low-resistance, and maintenance-free joint complete as required.	Mtr.	297	1066	316602
5.19	Supply and fixing of Exothermic Joints (T, Straight joints) complete as required.	Joint	40	2769	110760
6	**FIRE ALARM & FIRE TALK BACK SYSTEM**				
6.1	Supplying, installation, testing and commissioning of micro processor based intelligent addressable main fire alarm panel, central processing unit with the following loop modules and capable of supporting not less than 240 devices (including detectors) and minimum 120 detectors per loop and loop length up to 2 km, network communication card, minimum 320 character graphics/ LCD display with touch screen or other keypad and minimum 4000 events history log in the non volatile memory (EPROM), power supply unit (230 ± 5 % V, 50 hz), 48 hrs back-up with 24 volt sealed maintenance free batteries with automatic charger. The panel shall have facility to connect printer to printout log and facility to have seamless integration with analog/digital voice evacuation system (which is part of the schedule of work under SH: PA System) and shall be complete with all accessories . The panel shall be compatible for IBMS system with open protocol BACnet/ Modbus over IP complete as per specifications				
6.1.1	Ten Loop Panel	Each	1	476893	476893
6.2	Supplying, installation, testing & commissioning of central graphical fire alarm management system to centrally monitor and operate the fire alarm system complete as required.	Each	1	210264	210264
6.3	Supplying, installation, testing & commissioning of repeater panel with 320 character/ Touch screen LCD display with inbuilt reset, acknowledge and silence switches complete as required.	Each	1	113734	113734
6.4	Supplying, installation, testing & commissioning of intelligent analog addressable photothermal detector complete with mounting base complete as required.	Each	459	3004	1378836
6.5	Supplying, installation, testing & commissioning of response indicator on surface/recessed MS Box having two LED, metallic cover complete with all connections etc as required.	Each	226	306	69156
6.6	Supplying, installation, testing & commissioning of fault isolator complete with base as required.	Each	25	3434	85850
6.7	Supplying, installation, testing & commissioning of intelligent addressable thermal detector with rate of rise cum fixed temperature thermistor complete with base as required.	Each	42	2866	120372
6.8	Supplying, installation, testing & commissioning of addressable fire control module complete as required.	Each	13	3156	41028
6.9	Supplying, installation, testing & commissioning of addressable manual call point complete as required.	Each	13	4063	52819
6.10	Supplying, installation, testing & commissioning of addressable horn cum strobe complete as required.	Each	13	3682	47866
6.11	Supplying, installation, testing & commissioning of intelligent interface unit BACnet/ Modbus protocol i.e. supplying communication links between building management system and fire alarm control panel complete as required.	Each	1	196207	196207
6.12	Supplying, installation, testing & commissioning of addressable Monitor module complete with base as required.	Nos.	7	4695	32865
6.13	Supplying, installation, testing & commissioning of addressable Relay module complete with base as required.	Nos..	11	4989	54879
6.14	Supplying & laying of 2x1.5 sqmm fire survival armoured cable, 600/1000V rated with annealed copper conductor having glass mica fire barrier tape covered by an extruded layer of Cross Linkable Ethylene Propylene Rubber (EPR) insulation and LSZH inner bedding, steel wire armouring & LSZH outer sheath complete as required.	Meter	3301	386	1274186
6.15	Supplying and fixing 25 mm dia MS flexible pipe with PVC coating along with all ancillaries and accessories like coupler etc. as required.	Meter	200	60	12000
7	**SAFETY EQUIPMENTS**				
7.1	Providing & fixing in position 1000 mm wide , Electrical Insulating Mats as per IS 15652:2006, 2mm thick, suitable upto 3.3 KV , fire retardant, no effect of acids, alkalies and transformer oils, moisture proof, high tensile strength and texture finish / cloth impression (Anti slip , marking on top) .	Meter	50	682	34100
7.2	Supply and fixing in position approved shock treatment chart written in English, Hindi and local language. These charts shall be framed in wooden frame and covered with clear glass.	Nos.	1	367	367

S. No	DESCRIPTION	UNIT	QTY	Rate	Amount in Rs (With GST@ 18%)
7.3	Supply of First aid box as approved by St. John Ambulance Brigade /Indian Red Cross society conforming to IS : 2217 - 1963.	Nos.	1	1893	1893
7.4	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.	Nos.	8	315	2520
7.5	Supply and fixing safety instruction chart both in Hindi & English duly framed with 3 mm thick glass as required. (approximate front area 1.00 sq. metre)	Nos.	1	8070	8070
8	**EARTHING SYSTEM**				
8.1	Earthing with G.I. earth plate 600 mm X 600 mm X 6 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 Meter long etc. with charcoal/ coke and salt as required.	Set	12	8351	100212
8.2	Earthing with copper earth plate 600 mm X 600 mm X 3 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 Meter long etc. with charcoal/ coke and salt as required.	Set	6	15004	90024
8.3	Providing and fixing 25 mm X 5 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.	Meter	168	755	126840
8.4	Providing and fixing 25 mm X 5 mm G.I. strip on surface or in recess for connections etc. as required.	Meter	1974	287	566538
8.5	Providing and fixing 6 SWG dia G.I. wire on surface or in recess for loop earthing as required.	Meter	1050	84	88200
8.6	Providing and fixing 50 mm X 6 mm G.I. strip on surface or in recess for connections etc. as required.	Meter	21	421	8841
8.7	Providing and fixing 50 mm X 6 mm G.I. strip in 50 mm dia G.I. pipe from earth electrode including connection with G.I. nut, bolt, spring, washer excavation and re-filling etc. as required.	Meter	53	1115	59095
9	**CABLE TRAY & RACEWAY**				
9.1	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray (galvanisation thickness not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.				
9.1.1	100 mm width X 50 mm depth X 1.6 mm thickness	Meter	274	754	206596
9.1.2	150 mm width X 50 mm depth X 1.6 mm thickness	Meter	163	803	130889
9.1.3	225 mm width X 50 mm depth X 1.6 mm thickness	Meter	35	991	34685
9.1.4	300 mm width X 50 mm depth X 1.6 mm thickness	Meter	171	1062	181602
9.1.5	450 mm width X 50 mm depth X 2.0 mm thickness	Meter	99	1439	142461
9.1.6	600 mm width X 50 mm depth X 2.0 mm thickness	Meter	51	1925	98175
9.1.7	900 mm width X 62.5 mm depth X 2.0 mm thickness	Meter	22	2793	61446
9.2	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray “bends” (galvanisation not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.				
9.2.1	100 mm width X 50 mm depth X 1.6 mm thickness	Each	20	1252	25040
9.2.2	150 mm width X 50 mm depth X 1.6 mm thickness	Each	20	1368	27360
9.2.3	225 mm width X 50 mm depth X 1.6 mm thickness	Each	10	1811	18110
9.2.4	300 mm width X 50 mm depth X 1.6 mm thickness	Each	15	1977	29655
9.2.5	450 mm width X 50 mm depth X 2.0 mm thickness	Each	15	2844	42660
9.2.6	600 mm width X 50 mm depth X 2.0 mm thickness	Each	5	3985	19925
9.2.7	900 mm width X 62.5 mm depth X 2.0 mm thickness	Each	8	5932	47456
9.3	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray “Tee” (galvanisation not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.				
9.3.1	100 mm width X 50 mm depth X 1.6 mm thickness	Each	20	1427	28540
9.3.2	150 mm width X 50 mm depth X 1.6 mm thickness	Each	20	1486	29720
9.3.3	225 mm width X 50 mm depth X 1.6 mm thickness	Each	10	2097	20970
9.3.4	300 mm width X 50 mm depth X 1.6 mm thickness	Each	15	2294	34410
9.3.5	450 mm width X 50 mm depth X 2.0 mm thickness	Each	15	3324	49860
9.3.6	600 mm width X 50 mm depth X 2.0 mm thickness	Each	5	4687	23435
9.3.7	900 mm width X 62.5 mm depth X 2.0 mm thickness	Each	3	6984	20952
9.4	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray “Reducer” (galvanisation not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.				
9.4.1	100 mm width X 50 mm depth X 1.6 mm thickness	Each	20	1771	35420
9.4.2	150 mm width X 50 mm depth X 1.6 mm thickness	Each	20	2049	40980
9.4.3	225 mm width X 50 mm depth X 1.6 mm thickness	Each	10	2572	25720
9.4.4	300 mm width X 50 mm depth X 1.6 mm thickness	Each	10	2991	29910
9.4.5	450 mm width X 50 mm depth X 2.0 mm thickness	Each	10	3929	39290
9.4.6	600 mm width X 50 mm depth X 2.0 mm thickness	Each	3	5418	16254
9.4.7	900 mm width X 62.5 mm depth X 2.0 mm thickness	Each	3	7826	23478
9.5	Supply and fixing of following size of under floor GI raceways for distributing cabling in screed floor installations particularly suitable for application requiring EMC screening. Raceway should be made up of Pre galvanized sheet with minimum thickness of 1.5mm consist of body and cover. It should have average of 120GSM zinc coating. Raceway should be openable from top. Cover fitted on to the body with self forming screw and can be opened easily if required. Raceway should be supplied with required accessories such as fixing brackets and coupling plates as required. Raceway should be confirmed with the standard EN 50085-2-2 including all accessories complete as required				
9.5.1	100 mm wide x 38 mm deep raceway (1 compartment)	Meter	36	505	18180
9.5.2	150 mm wide x 38 mm deep raceway (2 compartment)	Meter	145	784	113680
9.5.3	Coupler Plate (38 mm)	Nos.	145	15	2175
9.5.4	Hardware, Nut, Bolt & Washer (8x20mm)	Nos.	581	4	2324
9.6	Supply and fixing of following size of Height adjustable under floor crossover Junction box with flyover for Raceways for direct access to cables at the intersection of Raceways supplied completely with base and cover plate(lid). Junction box should be made of Pre galvanized sheet consist of body and cover. Height of the junction box should be adjustable from minimum 60mm. Junction box should be supplied with the metal cover for protecting the junction box during constructions at site. It should be confirmed with the standard EN 50085-2-2s including all accessories complete as required:				
9.6.1	ADJ JB 150 X 150 X 50 X 1.5 MM	Nos.	7	786	5502
9.6.2	ADJ JB 200 X 200 X 50 X 1.5 MM	Nos.	22	913	20086
	Important Notes for raceways:-				
a.	Contractor to get the samples of floor and ceiling raceways to be approved from the Architect/ Project Manager/ Consultant/ Client before supply & erection.				

S. No	DESCRIPTION	UNIT	QTY	Rate	Amount in Rs (With GST@ 18%)
b.	Depth of the floor raceway is to be decided by the contractor after checking/ examining screed depth available at site. For this purpose chipping to be carried out at various places on the floor/ floors to carefully assess the depth/ floor margin available. Final approval is to be obtained from the Architect/ Project Manager/ Client before ordering/ fabricating raceway. The sizes & depths of raceways given in the BOQ are only tentative & indicative.				
c.	Contractor is also supposed to check and confirm the adequacy of raceway sizes by calculating the exact number of electrical circuit wires & N/W wires for respective Electrical & N/W raceways.				
10	**M.V. PANELs**				
	Design, Manufacture, Supplying, Transport to the site, Receiving, Unloading, Shifting to Sub-Station at various locations, handling, assembling, installation in correct aligned position, grouting with dash fasteners, GI nuts-bolts, testing and commissioning of the following bolted fabricated in compartmentalized (Form-3B construction) conform to IS: 8623/1993, Suitable for 415V, 3Phase, 4 Wire 50 Hz Ac supply, are housed in design from CRCA sheet steel of 2mm thick for frame work and door covers, 3mm thick for gland plate, i/c cleaning & finishing complete, having extensible type bus bars of high conductivity, SMC bus bar supports, the maunfacturer shall be certified from CPRI for short circuit withstand capacity of min. 70kA for 1 Sec., fabrication shall be done in transportable sections and all front and back doors shall be hinged type and earth with frame, Entire panel shall have a common earth bar as specified below at the rear with 2 Nos. earth stud each side, bus bars and control wiring with suitable size of FRLS PVC insulated copper conductor cable, cable alleys, cable gland plates in two half, i/c providing following switch gears :				
	The Bus bars will be Copper purity 99.9% / electrolytic grade E91 Aluminium duly sleeved with Helogen Free heat shrink coloured Insulated tube confirming to IEC 60684-3-247 Standard. The powder coating (70-80micron as per IS:13871 for indoor and 100-120 micron for outdoor), include one size higher terminal block in cable alley and interconnecting wires between bus bars and terminals via MCB.				
	General Notes for site visit report for Panels/ Rising Main before submitting GA.				
	The Manufacturer must visit the site before submitting GA drawings and submit a report consisting following:				
a.	Possible height for Panel.				
b.	Possible width for Panel				
c.	Back access will be possible or not.				
d.	Cable entry will be from top or bottom.				
e.	If entry from bottom whether MS. Stand is required or not.				
f.	If the panel is wall mounted whether the wall is available or not.				
g.	Path for movement of transportation of panel is possible or not i.e length, width etc. and the transportation sections shall be designed accordingly.				
h.	Sufficient space available at front & back after door opening.				
i.	Sufficient height available above panel for cable drop.				
j.	Actual floor to floor height for rising mains.				
	Also, refer to General Notes and Specifications for Panels/ Boards.				
a.	Provide thermostat controlled panel mounted heavy duty exhaust fan in each Vertical and space heater in Bus bar alley for all Main L.T Panel and Capacitor Panels.				
b.	Contractor to submit manufacturer's selection charts, Discrimination check certificate, insulation material & corners cover on bus-bars for approval.				
c.	If mentioned fault rating of bus-bar and circuit breaker is unavailable consider next available upside rating				
d.	Mimic diagram shall be provided on all panels.				
e.	It is recommonded that only one make of switchgear to be used in a board / Panel.				
f.	All live accessible parts shall be shrouded and all equipment shall be finger touch proof. SMC shrouds busbar supports shall be used. Padlocking facility shall be provided on all MCCB feeders doors and switch handles shall be locakble in OFF position.				
g.	**Equipments will be offered for following routine test only:-** i). Check of Bill of Materials as per approved drawing, ii). Visual and Dimensional Check, iii) Functional Check, iv) HV/Megger test as per relevant IS. v) Type tests from CPRI of any two panels as choice of electrical consultant.				
h.	**Minimum/Maximum Operating height-** 300/1800 respectively				
i.	**Sealing Arrangement**:- PE Foam Rubber Gasket				
j.	**Bus Bars Supports** - Non-Hygroscopic, Non Carbonising, Corrosinn Resistant, SMC Supports				
k.	1 Set of connector (Phase+Neutral) shall be provided in cable alley for all outgoing with interconnection wires between MCB and Connector.				
l.	Bottom base channel of floor standing panel shall be made of M.S. angle iron, not less than 50mm x 50mm x 5mm thick for panel overall height upto 1800mm and above in height 75mm x 75mm x 6mm thick, fabrication shall be done in transportable sections. Similarly, All outdoor use panel shall have bottom base stand of minimum 450mm M.S. angle iron 32mmx 32mmx6mm with fixing arrangement in RCC foundation.				
m.	Strip heater in each bus-bars section shall be provided in all Main L.T Panel & Capacitor Panel				
n.	No derating shall be applicable upto ambient temp. 50ºC for all breakers and selected components.				
o.	Each door other than bus bar section shall be 2 numbers wing knob cabinet cam lock with master key lock made of zinc alloy powder coated housing, handle and chrome plated cylinder and nut CL001.				
p.	**Minimum Air Clearances** between bus bars; (Calculation with required supporting document shall be submitted by Panel manufecturer along with GA diagram).				
	P-P=32mm, P-N=32mm,P-E=26mm and N-E=26mm				
q.	**Panel Power and control Wiring all FRLS PVC insulated**				
	AC voltage circuit-1.5 sqmm Red,Yellow,Blue &Black				
	Current circuit-1.5 sqmm Red,Yellow,Blue &Black				
	AC Control circuit-1.5 sqmm White for Phase & Black for Neutral				
	DC Control circuit-2.5 sqmm Grey				
	Power circuit- Red,Yellow,Blue for Phase &Black for Neutral				
	Labelling- Computerised Laminated Aluminium Name Plate with White letters on Blue/Black Background For Each Feeder and Panel Itself.				
r.	The treatment of Panel Shall be Fully automatic 9-tank process for metal treatment which consists of Solvent/ Alkaline Degreasing, Activation, Water Rinsing, De-rusting, Phosphating, Passivation and Water drying.				
s.	A separate compartment for Minimum 20% spare space of Panel shall be provided for outgoings in future and busbars shall be drilled accordingly.				
t.	All panels shall be compatible with the Building Management System (BMS).				
10.1	**MAIN DISTRIBUTION BOARD PANEL (MDB)**				
10.1.1	**INCOMER- 1 & 2 (FROM DG & TRANSFORMER)**				
	2 Nos. 1000Amps 4P EDO type Air circuit breaker built-in self powered micro-processor based releases for O/L,S/C,I/G&E/F of fault breaking capacity 50KA (Ics=Icu=Icw upto 415V manually operated, Inbuilt Shunt Trip indication. fitted with interlocked door, door sealing frame, automatic safety shutters and frame earthing contact, additional min. 4NO + 4NC Auxiliary contacts, the ACBs must be provided with terminal adaptors (Hr Vr), ACB conforming to IS-1397-2 (1993) and complice RoHS as amended up-to-date complete with following accessories for each complete with following accessories for each ACB. Terminals suitable for Bus duct connections on incomer side and bus bar connection at output sides				
	BUS Coupler				

S. No	DESCRIPTION	UNIT	QTY	Rate	Amount in Rs (With GST@ 18%)
	1 Nos. 1000Amps 4P EDO type Air circuit breaker built-in self powered micro-processor based releases for O/L,S/C,I/G&E/F of fault breaking capacity 50KA (Ics=Icu=Icw upto 415V manually operated, Inbuilt Shunt Trip indication. fitted with interlocked door, door sealing frame, automatic safety shutters and frame earthing contact, additional min. 4NO + 4NC Auxiliary contacts, the ACBs must be provided with terminal adaptors (Hr Vr), ACB conforming to IS-1397-2 (1993) and complice RoHS as amended up-to-date complete with following accessories for each complete with following accessories for each ACB. Terminals suitable for Bus duct connections on incomer side and bus bar connection at output sides				
	INCOMER-3 (FROM SOLAR SYSTEM)				
	1 No. 200A 4P MCCB built in microprocessor based release (adjustable O/L,S/C) of fault breaking capacity 35KA (Ics=Icu=100%) upto 415V manually operated with extended rotary handle with castle lock for door interlock with Phase spreader & Phase Barriers at both sides. MCCB shall conforming to IS-1397-2 1993 as amended.				
	Including Electrical & Mechanical interlocking between each Incomers				
	METERING, RELAY, INDICATOR & CT's				
	1Set of R,Y,B phase indication lamps with control MCB as per fault requirement for each Incomer.				
	Provide 6Nos indicating lamps on each ACB for status indication "ON","OFF" , tripped Due to Earth fault & Trip circuit healty,Short Circuit and true operation counter for all ACB				
	Wherever 4 Pole ACBs used, it shall have fully rated neutral equal to rating of the breaker & shall be protected against over-load faults with provisions for settings neutral unprotected, neutral protection at 0.5In and neutral protection at 1.0 In to ensure precise neutral protection.				
	1Set of 'ON/OFF' Indication lamps with control MCB for each MCCB outgoing.				
	1Nos. 30-300mA ELR with tape wound CBCT for each MCCB outgoings as shown in SLD.				
	1Set of trip due to earth leakage Indication lamps with each Earth Leakage Relay.				
	High Profile multifunction meter with demand monitor & Ind.Harmonics up to 31st level, in class 1.0 having modbus 485 communication. The meter should have a sampling rate of 128 samples/cycle . Measurement of V,A,HZ,PA ,KW,KWH,KVARH,KVAH,KVA,THD,DEMAND MONITOR & PHASE WISE energy monitoring through communication. input voltage measurement up to 600V L_L & starting current measurement of 10mA, flush mounting 96sqmm EN 8400 with import & export of kwh parameters in both incomers				
	Multifunction meter should be of flush mounting 96 sq mm with alphanumeric LED display with all electrical measurement like VAF, KW,KWH & PHASE WISE energy monitoring through communication RS 485 port available with meter. MFM should have a wide measurement range of 10mA to 6A & sampling rate of 128 samples per cycle. accuracy class of 1.0 with meter AUX supply 80--300v AC/DC in all outgoing feeders.				
	Provide seprate 3Nos. Dual ratio dual tape Resin Filled Nylon 66 Casing CTs, Class-1, in each transformer Incoming for solar Integration.				
	Single phase preventer, Phase reversal Relay, Under/Over voltage relay for each transformer and DG incomer with indicator for trip and hooter for alarm.				
	Reverse power relay for each D.G. set Incomer with indicator for trip and hooter for alarm				
	Provide control accessories like automatically controlled constant voltage constant current, 24/12 V DC battery charger with battery charging indication, battery charged indication, Over charged battery protection, low battery protection, High Voltage protection, charger on - AC, DC Ammeter, DC Voltmeter, 8 window fault annunciater with inbuilt P.B and Hooter, trip alarm and reset etc. for each D.G. Set incomer				
	Provide 12 window annunciator with hooter, 2 Window for over Current & Earth fault, 2 Window for OTI alarm & Trip, 2 Window for WTI alarm & Trip & 2 Window Bucholz alarm & Trip.				
	TVSS & BUSBARS SECTION:				
	BUSBAR SECTION : 1200 Amps TP+50%N, 50kA, 500volts grade busbar chamber of suitable length with Aluminium busbars mount on SMC supports. All interconnections shall be as follows; a). Upto 63A, FRLS PVC insulated copper flexible colour coded wires b). And above Aluminium Bus-bars , current density of bus-bars shall not be less than 1 Amps/sq.mm for Aluminium cross sectional area of Bus Bar and 24V DC AUX Bus bar				
	Bus Section with 1 No. Surge protection device Type 1 (Class B), true status indication, 7 Mode, spark gap type suitable for 10/ 350µs surge,Voltage Protection level Up < 4.0kV, Operating Temperature -40 deg 'c' - +80 deg 'C', Connected Between 3Nos. phase to neutral & 3Nos. phase to earth and 1Nos. neutral to earth with discharge Current Imax. ≥ 50KA Per mode & In ≥ 25kA per Mode. SPD with 4x125A SP HRC fuses of 100kA breaking capacity. For connecting SPD minimum 16sqmm copper wire must be used & length of connecting leads shall not be more than 500mm for per mode connection with each busbar including all necessary accessories. The SPD shall complience with IEC 61643-11 and certified by TUV CE ROHS UL 94V-O				
	OUTGOINGS CONNECTED AS SHOWN IN SLD:				
	3 Nos. 400A 4P MCCB built in microprocessor based release (adjustable O/L,S/C) of fault breaking capacity 35KA (Ics=Icu=100%) upto 415V manually operated with extended rotary handle with castle lock for door interlock with Phase spreader & Phase Barriers at both sides. MCCB shall conforming to IS-1397-2 1993 as amended.				
	4 Nos. 250A 4P MCCB built in microprocessor based release (adjustable O/L,S/C) of fault breaking capacity 35KA (Ics=Icu=100%) upto 415V manually operated with extended rotary handle with castle lock for door interlock with Phase spreader & Phase Barriers at both sides. MCCB shall conforming to IS-1397-2 1993 as amended.				
	1 No. 200A 4P MCCB built in Thermal Magnetic based release (adjustable O/L,S/C) of fault breaking capacity 35KA (Ics=Icu=100%) upto 415V manually operated with extended rotary handle with castle lock for door interlock with Phase spreader & Phase Barriers at both sides. MCCB shall conforming to IS-1397-2 1993 as amended.				
	1 Nos. 160A 4P MCCB built in Thermal Magnetic based release (adjustable O/L,S/C) of fault breaking capacity 35KA (Ics=Icu=100%) upto 415V manually operated with extended rotary handle with castle lock for door interlock with Phase spreader & Phase Barriers at both sides. MCCB shall conforming to IS-1397-2 1993 as amended.				
	1 No. 100A 4P MCCB built in Thermal Magnetic based release (adjustable O/L,S/C) of fault breaking capacity 35KA (Ics=Icu=100%) upto 415V manually operated with extended rotary handle with castle lock for door interlock with Phase spreader & Phase Barriers at both sides. MCCB shall conforming to IS-1397-2 1993 as amended.				
	2 No. 63A 4P MCCB built in Thermal Magnetic based release (adjustable O/L,S/C) of fault breaking capacity 35KA (Ics=Icu=100%) upto 415V manually operated with extended rotary handle with castle lock for door interlock with Phase spreader & Phase Barriers at both sides. MCCB shall conforming to IS-1397-2 1993 as amended.				
	2 No. 63A 4P 10kA MCB 'C' Curve				
	MAIN DISTRIBUTION BOARD PANEL (MDB) as described above.	Set	1	914013	914013
10.1.2	**INCOMER- 1 & 2 (FROM DG & MDB)**				
	2 Nos. 400 amps 4P EDO type Air circuit breaker built-in self powered micro-processor based releases for O/L,S/C,I/G&E/F of fault breaking capacity 50KA (Ics=Icu=Icw upto 415V manually operated, Inbuilt Shunt Trip indication. fitted with interlocked door, door sealing frame, automatic safety shutters and frame earthing contact, additional min. 4NO + 4NC Auxiliary contacts, the ACBs must be provided with terminal adaptors (Hr Vr), ACB conforming to IS-1397-2 (1993) and complice RoHS as amended up-to-date complete with following accessories for each complete with following accessories for each ACB. Terminals suitable for Bus duct connections on incomer side and bus bar connection at output sides				
	Buscoupler				
	1 Nos. 400 amps 4P EDO type Air circuit breaker built-in self powered micro-processor based releases for O/L,S/C,I/G&E/F of fault breaking capacity 50KA (Ics=Icu=Icw upto 415V manually operated, Inbuilt Shunt Trip indication. fitted with interlocked door, door sealing frame, automatic safety shutters and frame earthing contact, additional min. 4NO + 4NC Auxiliary contacts, the ACBs must be provided with terminal adaptors (Hr Vr), ACB conforming to IS-1397-2 (1993) and complice RoHS as amended up-to-date complete with following accessories for each complete with following accessories for each ACB. Terminals suitable for Bus duct connections on incomer side and bus bar connection at output sides				
	METERING, RELAY, INDICATOR & CT's				
	1Set of R,Y,B phase indication lamps with control MCB as per fault requirement for each Incomer.				
	Provide 6Nos indicating lamps on each ACB for status indication "ON","OFF" , tripped Due to Earth fault & Trip circuit healty,Short Circuit and true operation counter for all ACB				

S. No	DESCRIPTION	UNIT	QTY	Rate	Amount in Rs (With GST@ 18%)
	Wherever 4 Pole ACBs used, it shall have fully rated neutral equal to rating of the breaker & shall be protected against over-load faults with provisions for settings neutral unprotected, neutral protection at 0.5In and neutral protection at 1.0 In to ensure precise neutral protection.				
	1Set of 'ON/OFF' Indication lamps with control MCB for each MCCB outgoing.				
	1Nos. 30-300mA ELR with tape wound CBCT for each MCCB outgoings as shown in SLD.				
	1Set of trip due to earth leakage Indication lamps with each Earth Leakage Relay.				
	High Profile multifunction meter with demand monitor & Ind.Harmonics up to 31st level, in class 1.0 having modbus 485 communication. The meter should have a sampling rate of 128 samples/cycle . Measurement of V,A,HZ,PA ,KW,KWH,KVARH,KVAH,KVA,THD,DEMAND MONITOR & PHASE WISE energy monitoring through communication. input voltage measurement up to 600V L_L & starting current measurement of 10mA, flush mounting 96sqmm EN 8400 with import & export of kwh parameters in both incomers				
	Multifunction meter should be of flush mounting 96 sq mm with alphanumeric LED display with all electrical measurement like VAF, KW,KWH & PHASE WISE energy monitoring through communication RS 485 port available with meter. MFM should have a wide measurement range of 10mA to 6A & sampling rate of 128 samples per cycle. accuracy class of 1.0 with meter AUX supply 80--300v AC/DC in all outgoing feeders.				
	Provide seprate 3Nos. Dual ratio dual tape Resin Filled Nylon 66 Casing CTs, Class-1, in each transformer Incoming for solar Integration.				
	Single phase preventer, Phase reversal Relay, Under/Over voltage relay for each transformer and DG incomer with indicator for trip and hooter for alarm.				
	Reverse power relay for each D.G. set Incomer with indicator for trip and hooter for alarm				
	Provide control accessories like automatically controlled constant voltage constant current, 24/12 V DC battery charger with battery charging indication, battery charged indication, Over charged battery protection, low battery protection, High Voltage protection, charger on - AC, DC Ammeter, DC Voltmeter, 8 window fault annunciater with inbuilt P.B and Hooter, trip alarm and reset etc. for each D.G. Set incomer				
	Provide 12 window annunciator with hooter, 2 Window for over Current & Earth fault, 2 Window for OTI alarm & Trip, 2 Window for WTI alarm & Trip & 2 Window Bucholz alarm & Trip.				
	TVSS & BUSBARS SECTION:				
	BUSBAR SECTION : 500 Amps TP+50%N, 50kA, 500volts grade busbar chamber of suitable length with Aluminium busbars mount on SMC supports. All interconnections shall be as follows; a). Upto 63A, FRLS PVC insulated copper flexible colour coded wires b). And above Aluminium Bus-bars , current density of bus-bars shall not be less than 1 Amps/sq.mm for Aluminium cross sectional area of Bus Bar and 24V DC AUX Bus bar.				
	Bus Section with 1 No. Surge protection device Type 1 (Class B), true status indication, 7 Mode, spark gap type suitable for 10/ 350µs surge,Voltage Protection level Up < 4.0kV, Operating Temperature -40 deg 'c' - +80 deg 'C', Connected Between 3Nos. phase to neutral & 3Nos. phase to earth and 1Nos. neutral to earth with discharge Current Imax. ≥ 50KA Per mode & In ≥ 25kA per Mode. SPD with 4x125A SP HRC fuses of 100kA breaking capacity. For connecting SPD minimum 16sqmm copper wire must be used & length of connecting leads shall not be more than 500mm for per mode connection with each busbar including all necessary accessories. The SPD shall complience with IEC 61643-11 and certified by TUV,CE,ROHS,UL94V-O.				
	OUTGOINGS CONNECTED				
	1 Nos. 160A 4P MCCB built in Thermal Magnetic based release (adjustable O/L,S/C) of fault breaking capacity 35KA (Ics=Icu=100%) upto 415V manually operated with extended rotary handle with castle lock for door interlock with Phase spreader & Phase Barriers at both sides. MCCB shall conforming to IS-1397-2 1993 as amended.				
	3 No. 125A 4P MCCB built in Thermal Magnetic based release (adjustable O/L,S/C) of fault breaking capacity 35KA (Ics=Icu=100%) upto 415V manually operated with extended rotary handle with castle lock for door interlock with Phase spreader & Phase Barriers at both sides. MCCB shall conforming to IS-1397-2 1993 as amended.				
	8 No. 63A 4P MCCB built in Thermal Magnetic based release (adjustable O/L,S/C) of fault breaking capacity 35KA (Ics=Icu=100%) upto 415V manually operated with extended rotary handle with castle lock for door interlock with Phase spreader & Phase Barriers at both sides. MCCB shall conforming to IS-1397-2 1993 as amended.				
	5 Nos. 40A 4P 10kA MCB 'C' Curve				
	EMERGENCY DISTRIBUTION BOARD PANEL (MDB) as described above.	Set	1	609342	609342
10.2	**VENTILATION PANEL (TERRACE FLOOR)**				
	INCOMER				
	1 No. 100A TP+NL MCCB built in Thermal based release (adjustable O/L,S/C,E/F) of fault breaking capacity 35KA (Ics=Icu=100%) upto 415V manually operated with extended rotary handle with castle lock for door interlock with Phase spreader & Phase Barriers at both sides. MCCB shall conforming to IS-1397-2 1993 as amended.				
	METERING, INDICATOR AND RELAYs				
	Multifunction meter should be of flush mounting 96 sq mm with alphanumeric LED display with all electrical measurement like VAF, KW,KWH & PHASE WISE energy monitoring through communication RS 485 port available with meter. MFM should have a wide measurement range of 10mA to 6A & sampling rate of 128 samples per cycle.. accuracy class of 1.0 with meter AUX supply 80--300v AC/DC.				
	1Set of R,Y,B phase indication lamps with control MCB as per fault requirement for each Incomer.				
	Provide 3Nos indicating lamps for status indication "ON","OFF" , Tripped due to earth fault on each incomer MCCB				
	1Nos. 30-300mA ELR with CBCT in incomer.				
	TVSS AND BUS BARS FOR EACH SECTION				
	125 Amps TP+50%N, 35kA, 500volts grade busbar chamber of suitable length with Aluminium busbars mount on SMC supports. All interconnections shall be as follows; a). Upto 63A, FRLS PVC insulated copper flexible colour coded wires b). 64Amp to 199Amp Copper Bus-bars and above aluminium, current density of bus-bars shall not be less than 0.8Amps/sq.mm for Aluminium and 1.6Amps/sq.mm for copper cross sectional area of Bus Bar.				
	For each busbar: 1 No. Surge protection device Type 2 (Class C), 4 Mode, MOV type suitable for 8/ 20µs surge,Voltage Protection level Up < 1.8kV, Operating Temperature -40 deg 'c' - +80 deg 'C', Connected Between 3Nos. phase to neutral and 1Nos. neutral to earth with discharge Current Imax. ≥ 40KA Per mode & In ≥ 20kA per Mode. SPD with 63A 4P HRC fuses of 100kA breaking capacity. For connecting SPD minimum 10sqmm copper wire must be used & length of connecting leads shall not be more than 500mm for per mode connection including all necessary accessories. The SPD shall complience with IEC 61643-11 and certified by TUV,CE,ROHS,UL94V-O.				
	OUTGOINGS				
	4 Nos. 40A 4P 10kA MCB 'C' Curve				
	VENTILATION PANEL (TERRACE FLOOR) as described above.	Set	1	74540	74540
10.3	**OUTDOOR PANEL-1 (TERRACE FLOOR)**				
	INCOMER				
	1 No. 320A TP+NL MCCB built in microprocessor based release (adjustable O/L,S/C,E/F) of fault breaking capacity 35KA (Ics=Icu=100%) upto 415V manually operated with extended rotary handle with castle lock for door interlock with Phase spreader & Phase Barriers at both sides. MCCB shall conforming to IS-1397-2 1993 as amended.				
	METERING, INDICATOR AND RELAYs				

S. No	DESCRIPTION	UNIT	QTY	Rate	Amount in Rs (With GST@ 18%)
	Multifunction meter should be of flush mounting 96 sq mm with alphanumeric LED display with all electrical measurement like VAF, KW,KWH & PHASE WISE energy monitoring through communication RS 485 port available with meter. MFM should have a wide measurement range of 10mA to 6A & sampling rate of 128 samples per cycle.. accuracy class of 1.0 with meter AUX supply 80--300v AC/DC.				
	1Set of R,Y,B phase indication lamps with control MCB as per fault requirement for each Incomer.				
	Provide 3Nos indicating lamps for status indication "ON","OFF" , Tripped due to earth fault on each incomer MCCB				
	1Nos. 30-3000mA ELR with CBCT in incomer.				
	TVSS AND BUS BARS FOR EACH SECTION				
	400 Amps TP+50%N, 35kA, 500volts grade busbar chamber of suitable length with Aluminium busbars mount on SMC supports. All interconnections shall be as follows; a). Upto 63A, FRLS PVC insulated copper flexible colour coded wires b). 64Amp to 199Amp Copper Bus-bars and above aluminium, current density of bus-bars shall not be less than 0.8Amps/sq.mm for Aluminium and 1.6Amps/sq.mm for copper cross sectional area of Bus Bar.				
	For each busbar: 1 No Surge protection device Type 2 (Class C), 4 Mode, MOV type suitable for 8/ 20µs surge,Voltage Protection level Up < 1.8kV, Operating Temperature -40 deg 'c' - +80 deg 'C', Connected Between 3Nos. phase to neutral and 1Nos. neutral to earth with discharge Current Imax. ≥ 40KA Per mode & In ≥ 20kA per Mode. SPD with 63A 4P HRC fuses of 100kA breaking capacity. For connecting SPD minimum 10sqmm copper wire must be used & length of connecting leads shall not be more than 500mm for per mode connection including all necessary accessories. The SPD shall complience with IEC 61643-11 and certified by TUV,CE,ROHS,UL94V-O..				
	OUTGOINGS				
	9 Nos. 63A 4P 10kA MCB 'C' Curve + 63A 4P ELCB 300mA				
	2 Nos. 40A 4P 10kA MCB 'C' Curve + 40A 4P ELCB 300mA				
	4 Nos. 32A 4P 10kA MCB 'C' Curve + 32A 4P ELCB 300mA				
	OUTDOOR PANEL-1 (TERRACE FLOOR) as described above.	Set	1	282755	282755
10.4	**OUTDOOR PANEL-2 (TERRACE FLOOR)**				
	INCOMER				
	1 No. 250A TP+NL MCCB built in microprocessor based release (adjustable O/L,S/C,E/F) of fault breaking capacity 35KA (Ics=Icu=100%) upto 415V manually operated with extended rotary handle with castle lock for door interlock with Phase spreader & Phase Barriers at both sides. MCCB shall conforming to IS-1397-2 1993 as amended.				
	METERING, INDICATOR AND RELAYs				
	Multifunction meter should be of flush mounting 96 sq mm with alphanumeric LED display with all electrical measurement like VAF, KW,KWH & PHASE WISE energy monitoring through communication RS 485 port available with meter. MFM should have a wide measurement range of 10mA to 6A & sampling rate of 128 samples per cycle.. accuracy class of 1.0 with meter AUX supply 80--300v AC/DC.				
	1Set of R,Y,B phase indication lamps with control MCB as per fault requirement for each Incomer.				
	Provide 3Nos indicating lamps for status indication "ON","OFF" , Tripped due to earth fault on each incomer MCCB				
	1Nos. 30-300mA ELR with CBCT in incomer.				
	TVSS AND BUS BARS FOR EACH SECTION				
	300 Amps TP+50%N, 35kA, 500volts grade busbar chamber of suitable length with Aluminium busbars mount on SMC supports. All interconnections shall be as follows; a). Upto 63A, FRLS PVC insulated copper flexible colour coded wires b). 64Amp to 199Amp Copper Bus-bars and above aluminium, current density of bus-bars shall not be less than 0.8Amps/sq.mm for Aluminium and 1.6Amps/sq.mm for copper cross sectional area of Bus Bar.				
	For each busbar: 1 No Surge protection device Type 2 (Class C), 4 Mode, MOV type suitable for 8/ 20µs surge,Voltage Protection level Up < 1.8kV, Operating Temperature -40 deg 'c' - +80 deg 'C', Connected Between 3Nos. phase to neutral and 1Nos. neutral to earth with discharge Current Imax. ≥ 40KA Per mode & In ≥ 20kA per Mode. SPD with 63A 4P HRC fuses of 100kA breaking capacity. For connecting SPD minimum 10sqmm copper wire must be used & length of connecting leads shall not be more than 500mm for per mode connection including all necessary accessories. The SPD shall complience with IEC 61643-11 and certified by TUV,CE,ROHS,UL94V-O..				
	OUTGOINGS				
	9 Nos. 63A 4P 10kA MCB 'C' Curve + 63A 4P ELCB 300mA				
	2 Nos. 32A 4P 10kA MCB 'C' Curve + 32A 4P ELCB 300mA				
	OUTDOOR PANEL-2 (TERRACE FLOOR) as described above.	Set	1	226703	226703
10.5	**SDB-1 for Ground Floor (Light & Power)**				
	INCOMER				
	1 No. 250A TP+NL MCCB built in microprocessor based release (adjustable O/L,S/C,E/F) of fault breaking capacity 35KA (Ics=Icu=100%) upto 415V manually operated with extended rotary handle with castle lock for door interlock with Phase spreader & Phase Barriers at both sides. MCCB shall conforming to IS-1397-2 1993 as amended.				
	METERING, INDICATOR AND RELAYs				
	Multifunction meter should be of flush mounting 96 sq mm with alphanumeric LED display with all electrical measurement like VAF, KW,KWH & PHASE WISE energy monitoring through communication RS 485 port available with meter. MFM should have a wide measurement range of 10mA to 6A & sampling rate of 128 samples per cycle.. accuracy class of 1.0 with meter AUX supply 80--300v AC/DC.				
	1Set of R,Y,B phase indication lamps with control MCB as per fault requirement for each Incomer.				
	Provide 3Nos indicating lamps for status indication "ON","OFF", Tripped due to earth fault on each incomer MCCB				
	1Nos. 30-300mA ELR with CBCT in incomer.				
	TVSS AND BUS BARS FOR EACH SECTION				
	300 Amps TP+50%N, 35kA, 500volts grade busbar chamber of suitable length with Aluminium busbars mount on SMC supports. All interconnections shall be as follows; a). Upto 63A, FRLS PVC insulated copper flexible colour coded wires b). 64Amp to 199Amp Copper Bus-bars and above aluminium, current density of bus-bars shall not be less than 0.8Amps/sq.mm for Aluminium and 1.6Amps/sq.mm for copper cross sectional area of Bus Bar.				
	For each busbar: 1 No Surge protection device Type 2 (Class C), 4 Mode, MOV type suitable for 8/ 20µs surge,Voltage Protection level Up < 1.8kV, Operating Temperature -40 deg 'c' - +80 deg 'C', Connected Between 3Nos. phase to neutral and 1Nos. neutral to earth with discharge Current Imax. ≥ 40KA Per mode & In ≥ 20kA per Mode. SPD with 63A 4P HRC fuses of 100kA breaking capacity. For connecting SPD minimum 10sqmm copper wire must be used & length of connecting leads shall not be more than 500mm for per mode connection including all necessary accessories. The SPD shall complience with IEC 61643-11 and certified by TUV,CE,ROHS,UL94V-O..				
	OUTGOINGS				
	5 Nos. 100A 4P MCCB built in Thermal based release (adjustable O/L,S/C) of fault breaking capacity 25KA (Ics=Icu=100%) upto 415V manually operated with extended rotary handle with castle lock for door interlock with Phase spreader & Phase Barriers at both sides. MCCB shall conforming to IS-1397-2 1993 as amended.				
	1 No. 63A 4P 10kA MCB 'C' Curve				
	6 Nos. 40A 4P 10kA MCB 'C' Curve				
	8 Nos. 25A 4P 10kA MCB 'C' Curve				

S. No	DESCRIPTION	UNIT	QTY	Rate	Amount in Rs (With GST@ 18%)
	SDB-1 for Ground Floor (Light & Power) as described above.	Set	1	197796	197796
10.6	**SDB-2 for First Floor (Light & Power)**				
	INCOMER				
	1 No. 250A TP+NL MCCB built in microprocessor based release (adjustable O/L,S/C,E/F) of fault breaking capacity 35KA (Ics=Icu=100%) upto 415V manually operated with extended rotary handle with castle lock for door interlock with Phase spreader & Phase Barriers at both sides. MCCB shall conforming to IS-1397-2 1993 as amended.				
	METERING, INDICATOR AND RELAYs				
	Multifunction meter should be of flush mounting 96 sq mm with alphanumeric LED display with all electrical measurement like VAF, KW,KWH & PHASE WISE energy monitoring through communication RS 485 port available with meter. MFM should have a wide measurement range of 10mA to 6A & sampling rate of 128 samples per cycle.. accuracy class of 1.0 with meter AUX supply 80--300v AC/DC.				
	1Set of R,Y,B phase indication lamps with control MCB as per fault requirement for each Incomer.				
	Provide 3Nos indicating lamps for status indication "ON","OFF", Tripped due to earth fault on each incomer MCCB				
	1Nos. 30-300mA ELR with CBCT in incomer.				
	TVSS AND BUS BARS FOR EACH SECTION				
	300 Amps TP+50%N, 35kA, 500volts grade busbar chamber of suitable length with Aluminium busbars mount on SMC supports. All interconnections shall be as follows; a). Upto 63A, FRLS PVC insulated copper flexible colour coded wires b). 64Amp to 199Amp Copper Bus-bars and above aluminium, current density of bus-bars shall not be less than 0.8Amps/sq.mm for Aluminium and 1.6Amps/sq.mm for copper cross sectional area of Bus Bar.				
	For each busbar: 1 No Surge protection device Type 2 (Class C), 4 Mode, MOV type suitable for 8/ 20µs surge,Voltage Protection level Up < 1.8kV, Operating Temperature -40 deg 'c' - +80 deg 'C', Connected Between 3Nos. phase to neutral and 1Nos. neutral to earth with discharge Current Imax. ≥ 40KA Per mode & In ≥ 20kA per Mode. SPD with 63A 4P HRC fuses of 100kA breaking capacity. For connecting SPD minimum 10sqmm copper wire must be used & length of connecting leads shall not be more than 500mm for per mode connection including all necessary accessories. The SPD shall complience with IEC 61643-11 and certified by TUV,CE,ROHS,UL94V-O.				
	OUTGOINGS				
	4 Nos. 100A 4P MCCB built in Thermal based release (adjustable O/L,S/C) of fault breaking capacity 25KA (Ics=Icu=100%) upto 415V manually operated with extended rotary handle with castle lock for door interlock with Phase spreader & Phase Barriers at both sides. MCCB shall conforming to IS-1397-2 1993 as amended.				
	1 No. 63A 4P 10kA MCB 'C' Curve				
	6 Nos. 40A 4P 10kA MCB 'C' Curve				
	7 Nos. 25A 4P 10kA MCB 'C' Curve				
	SDB-2 for First Floor (Light & Power) as described above.	Set	1	253702	253702
10.7	**SDB-3 for Second Floor (Light & Power)**				
	INCOMER				
	1 No. 200A TP+NL MCCB built in thermal magnetic based release (adjustable O/L,S/C,E/F) of fault breaking capacity 35KA (Ics=Icu=100%) upto 415V manually operated with extended rotary handle with castle lock for door interlock with Phase spreader & Phase Barriers at both sides. MCCB shall conforming to IS-1397-2 1993 as amended.				
	METERING, INDICATOR AND RELAYs				
	Multifunction meter should be of flush mounting 96 sq mm with alphanumeric LED display with all electrical measurement like VAF, KW,KWH & PHASE WISE energy monitoring through communication RS 485 port available with meter. MFM should have a wide measurement range of 10mA to 6A & sampling rate of 128 samples per cycle.. accuracy class of 1.0 with meter AUX supply 80--300v AC/DC.				
	1Set of R,Y,B phase indication lamps with control MCB as per fault requirement for each Incomer.				
	Provide 3Nos indicating lamps for status indication "ON","OFF", Tripped due to earth fault on each incomer MCCB				
	1Nos. 30-300mA ELR with CBCT in incomer.				
	TVSS AND BUS BARS FOR EACH SECTION				
	250 Amps TP+50%N, 35kA, 500volts grade busbar chamber of suitable length with Aluminium busbars mount on SMC supports. All interconnections shall be as follows; a). Upto 63A, FRLS PVC insulated copper flexible colour coded wires b). 64Amp to 199Amp Copper Bus-bars and above aluminium, current density of bus-bars shall not be less than 0.8Amps/sq.mm for Aluminium and 1.6Amps/sq.mm for copper cross sectional area of Bus Bar.				
	For each busbar: 1 No Surge protection device Type 2 (Class C), 4 Mode, MOV type suitable for 8/ 20µs surge,Voltage Protection level Up < 1.8kV, Operating Temperature -40 deg 'c' - +80 deg 'C', Connected Between 3Nos. phase to neutral and 1Nos. neutral to earth with discharge Current Imax. ≥ 40KA Per mode & In ≥ 20kA per Mode. SPD with 63A 4P HRC fuses of 100kA breaking capacity. For connecting SPD minimum 10sqmm copper wire must be used & length of connecting leads shall not be more than 500mm for per mode connection including all necessary accessories. The SPD shall complience with IEC 61643-11 and certified by TUV,CE,ROHS,UL94V-O.				
	OUTGOINGS				
	3 Nos. 63A 4P 10kA MCB 'C' Curve				
	10 Nos. 40A 4P 10kA MCB 'C' Curve				
	8 Nos. 25A 4P 10kA MCB 'C' Curve				
	SDB-3 for Second Floor (Light & Power) as described above.	Set	1	239469	239469
10.7	**UPS Output Panel located in UPS Room**				
	INCOMER				
	2 Nos. 40A TP+ 2NL MCCB built in microprocessor based release (adjustable O/L,S/C,E/F) of fault breaking capacity 35KA (Ics=Icu=100%) upto 415V manually operated with extended rotary handle with castle lock for door interlock with Phase spreader & Phase Barriers at both sides. MCCB shall conforming to IS-1397-2 1993 as amended with parallel kit.				
	METERING, INDICATOR AND RELAYs				
	Multifunction meter should be of flush mounting 96 sq mm with alphanumeric LED display with all electrical measurement like VAF, KW,KWH & PHASE WISE energy monitoring through communication RS 485 port available with meter. MFM should have a wide measurement range of 10mA to 6A & sampling rate of 128 samples per cycle. accuracy class of 1.0 with meter AUX supply 80--300v AC/DC.				
	1Set of R,Y,B phase indication lamps with control MCB as per fault requirement for each Incomer.				
	Provide 3Nos indicating lamps for status indication "ON","OFF", Tripped due to earth fault on each incomer MCCB				
	1Nos. 30-300mA ELR with CBCT in incomer.				
	TVSS AND BUS BARS FOR EACH SECTION				
	60 Amps TP+200%N, 35kA, 500volts grade busbar chamber of suitable length with Copper busbars mount on SMC supports. All interconnections shall be as follows; a). Upto 63A, FRLS PVC insulated copper flexible colour coded wires b). and above Copper Bus-bars and, current density of bus-bars shall not be less than 1.6Amps/sq.mm for copper cross sectional area of Bus Bar.				

S. No	DESCRIPTION	UNIT	QTY	Rate	Amount in Rs (With GST@ 18%)
	For each busbar: 1 No Surge protection device Type 2 (Class C), 4 Mode, MOV type suitable for 8/ 20µs surge,Voltage Protection level Up < 1.8kV, Operating Temperature -40 deg 'c' - +80 deg 'C', Connected Between 3Nos. phase to neutral and 1Nos. neutral to earth with discharge Current Imax. ≥ 40KA Per mode & In ≥ 20kA per Mode. SPD with 63A 4P HRC fuses of 100kA breaking capacity. For connecting SPD minimum 10sqmm copper wire must be used & length of connecting leads shall not be more than 500mm for per mode connection including all necessary accessories. The SPD shall complience with IEC 61643-11 and certified by TUV,CE,ROHS,UL94V-O.				
	OUTGOINGS				
	11 Nos. 32A DP 10kA MCB 'D' Curve				
	UPS Output Panel located in UPS Room as described above.	Set	1	112691	112691
10.8	**EXTERNAL LIGHTING PANEL-EX1 (OUTDOOR PANEL-IP:65)**				
	Incomer				
	1 Nos. 63A 4P MCCB built in Thermal based release (adjustable O/L,S/C) of fault breaking capacity 25KA (Ics=Icu=100%) upto 415V manually operated with extended rotary handle with castle lock for door interlock with Phase spreader & Phase Barriers at both sides. MCCB shall conforming to IS-1397-2 1993 as amended.				
	1Set of R,Y,B phase indication lamps with control MCB as per fault requirement for each Incomer.				
	Busbars				
	3Nos. SPN copper insulated bus bars link of minimum of 100Amps				
	Digital Astro-time with 230V AC supply & operating range of 184…264V AC & shall have contact rating of 1CO(SPDT), 16A/250V AC with AgSnO2 contact material and in- built minimum 6 years battery back up. Switching of loads shall be as per Astro-program i.e. calculation of sunrise and sunset times through date, time and location coordinates. It shall also have the provision for calculation of sunrise and sunset times by programming through 2 digits of initial PIN / POSTAL codes. It shall have an option of Astro ON period override by time switch and Offset function which allows programming of switching times offset from the astronomic time (by up to 90 min, in 10 min steps). It shall have LCD status indication with back light display along with internal easily replaceable battery on the front side for set-up and programming. It shall be suitable for "Smart" mode 4 digit protected programming via smartphones with NFC communication.				
	Outgoings				
	3 Nos. 63A DP 100mA RCCB one per phase				
	3 Nos. 63A, DP Contactor one per phase with wide band coil and 1Set of Auto/Manual Selector Switch, start/stop push botton, and ON/OFF indicators with each contactor				
	18 Nos. 6-16A, SP MCB 10kA 'C' Curve				
	1 No. 32A single phase industrial socket backed up 32A, SP MCB connected after main incomer				
	For each busbar: 1 No Surge protection device Type 2 (Class C), 4 Mode, MOV type suitable for 8/ 20µs surge,Voltage Protection level Up < 1.8kV, Operating Temperature -40 deg 'c' - +80 deg 'C', Connected Between 3Nos. phase to neutral and 1Nos. neutral to earth with discharge Current Imax. ≥ 40KA Per mode & In ≥ 20kA per Mode. SPD with 63A 4P HRC fuses of 100kA breaking capacity. For connecting SPD minimum 10sqmm copper wire must be used & length of connecting leads shall not be more than 500mm for per mode connection including all necessary accessories. The SPD shall complience with IEC 61643-11 and certified by TUV,CE,ROHS,UL94V-O..				
	MS Stand of 450mm height to be provided with black painted.				
	EXTERNAL LIGHTING PANEL-EX1 (OUTDOOR PANEL) as described above and shown in SLD.	Set	1	1698437	1698437
10.9	Supply installation testing and commissioning of cubical type double door out door type Feeder pillar IP 65 suitable for 415V, 3 phase, 4 wire 50 Hz AC supply system fabricated in compartmentalized (preferable) design from CRCA sheet steel of 2mm thick for frame work and covers. 3mm thick for gland plated i/c cleaning & finishing complete with 7 tank process for powder coating in approved shade, having suitable capacity extensible type FP Aluminium alloy Bus bars of high conductivity. DMC.SMC bus bar supports, with short circuit withstand capacity of 50 KA for 1 sec. bottom base channel of MS section not less than 75mm x 50mm x 5mm thick, fabrication shall be done in transportable sections, entire feeder pillar shall have a common earth bar of suitable size at the rear with 2 Nos earth solid connections from main bus bar to switch gears with required 1.5 sqmm zero halogen fire retardant low smoke insulated copper conductor s/c cable, cable alleys, cable gland plate in two half				
	Details of cost for one each				
	MATERIAL				
	Bus Bar				
	800A 415V, 3 phase 4 strip (100% neutral) 50Hz Aluminium bus bar				
	I/C in COS 800 A, front operated on load Change over switch and feeder pillar incomer 800A FP MCCB with microprocess release.				
	Out Going: following MCCBs as outgoings in feeder pillar				
	1 nos. 630 A, TPN, 50 kA,MCCB with Microprocessor based O/C,S/C,&E/F protection with rotary handle.				
	2 nos. 400 A, TPN, 50 kA,MCCB with Microprocessor based O/C,S/C,&E/F protection with rotary handle.				
	2 nos. 250 A, TPN, 50 kA,MCCB with Microprocessor based O/C,S/C,&E/F protection with rotary handle.				
	2 nos. 125 A, TPN, 50 kA,MCCB with Microprocessor based O/C,S/C,&E/F protection with rotary handle.				
	10 No's TPN MCB 63A 10KA				
	10 No's DP MCB 63A 10KA				
	all out goings with ON.OFF, indication. Digital multifunction meter . Digital Amp meter with selector switches etc.	Set	**1**	1041156	1041156
11	**L.T./ CONTROL CABLES**				
11.1	Supply of following sizes of Power Cables multi stranded **Aluminium** conductor, XLPE Insulated , cores laid up PVC tape / Extruded Inner sheath , Armour, FRLS at outer sheath,1100V grade as per IS 7098(Part 1) 1988 with upto date amendments.				
11.1.1	4x 16 sq.mm.	RM	737	281	207097
11.1.2	4x 25 sq.mm.	RM	149	367	54683
11.1.3	3.5 x 35 sq.mm.	RM	352	417	146784
11.1.4	3.5 x 95 sq.mm.	RM	209	921	192489
11.1.5	3.5 x 150 sq.mm.	RM	132	1381	182292
11.1.6	3.5 x 240 sq.mm.	RM	165	2196	362340
11.1.7	3.5 x 300 sq.mm.	RM	3520	2701	9507520
11.2	Supply of following sizes of Power Cables multi stranded **Copper** conductor, XLPE Insulated , cores laid up PVC tape / Extruded Inner sheath , Armour, FRLS at outer sheath,1100V grade as per IS 7098(Part 1) 1988 with upto date amendments.				
11.2.1	4x 4 sq.mm.	RM	99	487	48213
11.2.2	4x 6 sq.mm.	RM	1243	717	891231
11.2.3	4x 10 sq.mm.	RM	1881	1165	2191365
11.2.4	2x 6 q.mm.	RM	429	399	171171
11.3	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.				
11.3.1	Upto 35 sq. mm (clamped with 1mm thick saddle)	Meter	4138	53	219293
11.3.2	Above 35 sq. mm and upto 95 sq. mm (clamped with 25x3mm MS flat clamp)	Meter	209	109	22781

S. No	DESCRIPTION	UNIT	QTY	Rate	Amount in Rs (With GST@ 18%)
11.3.3	Above 95 sq. mm and upto 185 sq. mm (clamped with 25/40x3mm MS flat clamp)	Meter	132	138	18216
11.3.4	Above 185 sq. mm and upto 400 sq. mm (clamped with 40x3mm MS flat clamp)	Meter	517	226	116842
11.4	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size in the existing RCC/ HUME/ METAL pipe as required.				
11.4.1	Upto 35 sq. mm	Meter	752	47	35363
11.4.2	Above 185 sq. mm and upto 400 sq. mm	Meter	3168	170	538560
11.5	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				
11.5.1	3½ X 35 sq. mm (32mm)	Each	16	437	6992
11.5.2	3½ X 95 sq. mm (45 mm)	Each	4	684	2736
11.5.3	3½ X 150 sq. mm (50 mm)	Each	4	798	3192
11.5.4	3½ X 240 sq. mm (62mm)	Each	6	1160	6960
11.5.5	3½ X 300 sq. mm (70 mm)	Each	16	336	5376
11.5.6	4 X 16 sq. mm (28mm)	Each	44	366	16104
11.5.7	4 X 25 sq. mm (28mm)	Each	4	373	1492
11.6	Supplying and making end termination with brass compression gland and copper lugs for following size of PVC insulated and PVC sheathed / XLPE copper conductor cable of 1.1 KV grade as required.				
11.6.1	4C X 4 sq. mm (19mm)	Each	4	343	1372
11.6.2	4C X 6 sq. mm (19mm)	Each	48	350	16800
11.6.3	4 X 10 sq. mm (25 mm)	Each	80	387	30960
11.6.4	2 X 6 sq. mm (19 mm)	Each	18	320	5760
11.7	Supplying and drawing of following sizes of 1.1kV grade Single core FRLS PVC insulated Single core unsheathed Industrial Flexible Cable conforming to IS:694/1990 and IS: 732 for installation with Flexible Bright annealed copper conductor for 1.1kV voltage grade in the existing Cable Tray/ Raceway/Conduit as required.				
11.7.1	1 x 4 sq. mm	Meter	210	131	27510
11.7.2	1 x 10 sq. mm	Meter	297	265	78705
11.8	Supplying and laying of following size DWC 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.				
11.8.1	63 mm dia (OD-63 mm & ID-51 mm nominal)	Meter	1000	289	289000
11.8.2	200 mm dia (OD-200 mm & ID-175 mm nominal)	Meter	2700	733	1979100
12	**PUBLIC ADDRESS SYSTEM**				
12.1	Supplying, installation, testing & commissioning of 6 zone, voice alarm controller with USB, MP4 player (including 6 zone button paging station) with seamless integration facility with main fire alarm panel for voice evacuation complete as required.	Each	1	132115	132115
12.2	Supplying, installation, testing & commissioning of 1.5/3/6W ceiling speaker complete as required.	Each	130	1025	133250
12.3	Supplying, installation, testing & commissioning of 1.5/3/6W metal box ceiling/wall speakers complete as required.	Each	50	1891	94550
12.4	Supplying, installation, testing & commissioning of digital audio amplifier 75 Watt, 25V rms operating at 240 Volt AC Supply complete as required.	Each	10	152368	1523680
12.5	Supplying, installation, testing & commissioning of Voice command keypad 6 zone, with microphone assembly complete as required.	Each	1	85450	85450
12.5	Supplying and drawing of cable Fire Retardant PVC insulated copper conductor cable in the existing surface / recessed steel conduit of following pairs, cores and size including connections and interconnections etc. as required.				
12.5.1	speaker cable Single pair, 2-core, 1.5 sqmm	Meter	1723	61	105103
12.6	Supplying and fixing of following sizes of steel conduit along with 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.				
12.6.1	25 mm	Meter	1723	289	497947
13	**UPS SYSTEM**				
13.1	Supplying, installation, Testing & Commissioning of following capacity at full load (Unity Power Factor) at operating temperature 0 to 40 0C, Relative humidity 0 to 95%, Online double conversion true sine wave Uninterrupted hot swapable (allow for the replacement or addition of battery modules without shutting down the entire system) modular Power Supply (UPS) system with N+1 modules (N denotes total number of modules required for rated capacity). The UPS shall include a Rectifier, inverter, battery bank suitable for 30 minutes back up (Battery VAH capacity shall not be less than 1600 VAH per KVA of UPS rating per Hour backup time) on full load (Battery shall be VRLA, SMF in ABS Container) and Static Bypass switch along with provision for manual bypass, suitable isolation transformer for additional protection against neutral faults etc. UPS shall have inbuilt phase sequence correction. The UPS systems offered are to be of the latest technology with Digital Control Microprocessor based for reliable operation using Insulated Gate Bipolar Transistor (IGBT)'s both for the rectifier & inverter (3 Level) with PWM (Pulse Width Modulation). The quality of design, manufacturing and inspection process should confirm to the relevant Inter-national standards such as IEC/EN/VDE. The operating efficiency of the UPS systems shall be >96% while operating on battery mode and delivering quality power to the 100% non-linear loads. Current total harmonic effect(ITHD) on the input grid shall be < 5% at 50 %load. (The required LC (inductor (L) and a capacitor (C)) filters shall be included in UPS cost), extreme power factor kit to be included to limit the input power factor (PF) to 0.99 and output power factor shall be unity (i.e. kw rating of the UPS shall be kva rating x 1), however UPS shall be suitable to take load at 0.7 laging to 0.7 leading power factor loads. UPS shall be suitable for incoming supply AC : 3Phase 400V +/-20%, 50 Hz +/-5 Hz, AC Output voltage: 3Phase 415 Volt, 50 Hz +/- 0.2Hz, Overload capacity of 120% for 10 mins, Sine wave output. Non condensing, noise level less than 60db at 1 meter distance, protections: Input Under voltage over voltage, abnormal out voltage, battery over charging, output over current, short circuit protection, battery deep discharge protection, 10KV surge. UPS must comply with low voltage electromagnetic compatibility (EMC) achieved as per EN 6204, EN6204 Part I and Part 2, it shall be a Voltage and Frequency Independent (VFI)-type UPS. . Communication RS232/RS485/SNMP port open protoc ol for BMS integration, all hardware & software for iOT Communication as per approved by Engineering in charge. Required battery racks and interconnecting copper conductor cables of suitable size and connectors and all required accessories are inclusive of the cost). This system must provide a means for logging and alarming of all monitored points plus email notification. Forced air-cooling with integral inbuilt fans with redundancy (if one fan fail UPS should be able to handle at least 80% of the load. Noise Level 65 DB at 1 meter distance. The system shall be in compliance IEC 62040- 1,2 & 3 , IS: 16242 and CPWD Specification				
13.1.1	10KVA (Each Power module shall be < 10 KVA)	Each	2	208893	417786
14	**DATA NETWORKING & CCTV SYSTEM (PASSIVE WORK)**				
14.1	Supplying, Installation, Testing and commissioning of CAT6 Copper Information Outlet (IO) with face plate of color as per site requirement, should have ETL/UL verification program certificate for compliance with ANSI/TIA-568.2-D. All copper Cable and Components should be from same OEM to maintain compatibility and interoperability etc. complete as required.	Each	99	212	20988

S. No	DESCRIPTION	UNIT	QTY	Rate	Amount in Rs (With GST@ 18%)
14.2	Supplying, drawing, Installation, Testing and commissioning of CAT6 UTP LSZH 23AWG Twisted Pair Cable in existing conduit/ on surface, Category 6 Unshielded Twisted Pair, 4 pair should be complied as per UL/ETL verification program for compliance with ANSI/TIA-568.2-D standard. Outer diameter should be in the range of 6.1mm nominal with Operating Temperature Range : -5° to +60°C, Bending Radius : < 4 X Cable Diameter at 5°C + 1°C and Pulling Force : 11.5Kg etc. complete as required.				
14.2.1	1 Run of cable	Meter	538	60	32280
14.2.2	2 Run of cable	Meter	1083	96	103968
14.2.3	3 Run of cable	Meter	897	131	117507
14.2.4	4 Run of cable	Meter	135	167	22545
14.3	Supplying and fixing of following sizes of steel conduit along with 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.				
14.3.1	20 mm	Meter	538	254	136652
14.3.2	25 mm	Meter	1980	289	572220
14.3.3	32 mm	Meter	135	360	48600
14.4	Supplying, Installation, Testing and commissioning of following CAT6 Patch Cord should have ETL/UL verification program certificate for compliance with ANSI/TIA-568.2-D etc. complete as required.				
14.4.1	Copper Patch Cords of length 1m (3ft)	Each	99	151	14949
14.4.2	Copper Patch Cords of length 3m (10ft)	Each	105	227	23835
14.5	Supplying Installation Testing and Commissioning of 24 port Cat6 Patch Panel loaded. Must be of 1U height with clear label holders and white label with the panel. 24 Ports Cat-6 Patch Panel should have ETL/UL verification program certificate for compliance with ANSI/TIA-568.2-D etc. complete as required.	Each	6	5278	31668
14.6	Supplying, Installation, Testing and commissioning of RJ45 Connector for CAT 6/6A Cables. RJ45 modular plug supports 4 twisted pairs, 8 positions, 8 connectors. Housing: PC, UL94V-2, transparent color, Use for 24- 26 AWG stranded wires etc. complete as required.	Each	99	9	891
14.7	Supplying and fixing 24U Rack with 4 inch Castor wheels and front brake Floor Standing Rack with Main Frame Pillar of 1.25mm Powder Coated CRCA Sheet with removable side panels, L- Shape adjustable Vertical Mounting Rail of 2mm with 'U'Marking completely knocked-down condition (CKD) Shape, fitted with 4 number cooling fans, minimum 5nos two line cable entry/exit provision at top and bottom with rubber protection, Front door 5mm Toughened Glass with MS frame or MS perforated with lock, Rear MS vented or perforated door, Powder coated Color- RAL- 7035 or black, complied with UL & RoHS, 2 x 6 sockets 16A power distribution units, 3 numbers closed cable organizer, Hardware mounting screws packet of 20 x 1 number, etc. complete as required.	Each	2	21201	42402
14.8	Supplying and fixing of following size Wall Mount Rack having Fixed Structure with 0.8mm CRCA Sheet, completely knocked-down condition (CKD) Shape, Vertical Mounting Rail 1.6 mm with 'U'Marking, Minimum 2 cable entry/exit provision at Top and bottom with rubber protection, Front 5mm Toughened Glass with lock, wall mounting kit, Powder coated Color- RAL- 7035, complied with UL & RoHS, 2 x 6sockets 16A power distribution units, 3 numbers closed cable organizer, Hardware mounting screws packet of 20 x 1 number, etc. complete as required.				
14.8.1	9U Rack	Each	4	8960	35840
14.9	Supplying, installation, Testing and commissioning of following capacity 24 port Layer 2 indoor Network Switch having features and specifications etc. as mentioned here under: At least 24 X RJ-45 Gigabit Ethernet Ports and additional 2 X 10G Base -T with 4 X SFP Ports with non-blocking architecture by having Switching capacity of min. 168Gbps and packet forwarding rate of 125Mpps or higher, 16K MAC table. Console Port, USB port, Stacking support of min. 8 units per stack. Internal dual AC Power supply, STP, RSTP, MSTP, BPDU Filter, BPDU Restriction, Min. 9K Jumbo Frame, LBD, IGMP Snooping V1/V2/V3, MLD Snopping V1/V2. IGMP /MLD Groups 1K or more, IPv4/IPv6 Loopback Interface, 16 L3 IP Interface, Ipv6 ND, VRRPv3, UDP Helper, ECMP. VLAN: 802.1Q, port based, Q-in-Q, Multicast VLAN, Protocal VLAN, VLAN Trunking, DHCP Snopping, Server, server Screening. RADIUS , TACACS+ Authentication, QoS:802.1P, 8 queues per port, Qos : WPR, Strict+ WPR, WRED, 802.1p. ACL: MAC based, IPv4C IPv6, TCP/UDP Port number, time based ACL, TFTP Client, SNMP V1, v2c, v3, SNMP traps, RMON, DHCP server, relay, client, LLDP, LLDP-MED, OAM, Dying Gasp, 802.3ah, sflow, RIP, OSPF v2/v3, policy based route, SSL, SSH. 6 kV surge protection on all Gigabit Ethernet ports and on all GE RJ-45 access ports. Certifications: UL, CE, FCC, RoHS, MTCTE, OEM/Product must be on Trusted Telecom Portal of Department of Telecommunication, Government of India etc. complete as required.				
14.9.1	24 port PoE Layer 2 Network Switch with PoE Support of 370W or higher with each copper port supporting 802.3at PoE+ min.	Each	4	125393	501572
14.9.2	24 port Layer 2 Non-PoE Network Switch	Each	2	86163	172326
14.1	Supplying, installation, Testing and commissioning of following capacity 24 port Layer 3 Network Switch having features and specifications etc. as mentioned here under: At least 20 X RJ-45 Gigabit Ethernet Ports and additional 4 combo 10/100/1000 base-t/SFP Ports with additional 4 SFP+ ports non-blocking architecture by having Switching capacity of min. 128Gbps and packet forwarding rate of 95Mpps or higher, 16K MAC table. Console Port, USB port, Internal AC Power supply with operating temperature of 0 to +50 0C. Stacking port with stacking support of minimum 8 units per stack. 48K Mac address, 9K or more Jumbo frame, ERPS with enabling ring to converge in less than 50 ms from node or link failure, Static routing, Static, 6to4, ISATAP and GRE, IPv6 Neighbor Discovery (ND), BGP, ISIS, MPLS, VRRP v2, OSPFv2/v3, PBR, Route Redistribution, RIPv1/v2/ng, IP Helper all L3 Protocols should support from day 1 for both IPv6 and IPv4, 802.1x, Port security , Radius C TACACS+ authentication C accounting, DAD, DAI, DoS attack prevention, SSH, Guest VLAN, IP Access List, MAC Access List. Multicast: VLAN, PIM-SM, PIMDM, PIM- SDM, PIM-SMv6, DVMRP v3 and MSDP, IGMP C MLD Snooping, Flow mirroring, IGMP C MLD Snooping Querier, Per-VLAN IGMP C MLD Snooping. SNMP, Dual configurations, Multiple images, RMON,LLDP/LLDP-MED, sFlow, DHCP/BOOTP Client,IPv4/IPv6, Syslog server, Debug command, 802.3ahEthernet Link OAM, 802.1ag Connectivity Fault, Y.1731 OAM, 802.1Qbb Priority- based Flow Control(PFC), Dying Gasp, Cable Diagnostics , 6 kV surgeprotection on all Gigabit Ethernet ports and on all GERJ-45 access ports. Certifications: UL, CE, FCC,RoHS, MTCTE, OEM/Product must be on TrustedTelecom Portal of Department of Telecommunication,Government of India etc. complete as required.	Each	1	193791	193791
15	**CCTV SYSTEM**				
15.1	Supplying Installation Testing and Commissioning of 4MP IP IR Dome Camera having following specifications and features etc :-				
	1) Signal System: PAL/NTSC, Signal to Noise Ratio: > 50 dB,Camera should display Camera title, Date & Time in live & recorded video				
	2)Image Sensor: 1/2.8" or better progressive Scan CMOS to get color image even at night condition(Minimum Illumination: 0.006 Lux@ F1.4, AGC ON, 0 lux with IR or better) True Day & Night High Performance Mechanical IR cut filter with auto switch, Integrated IR Source (Auto, Manual)- Inbuilt IR LED's with effective distance upto 50 meter or better and 30 meter for colour view in night, Imaging: 1/3s to 1/30000s electronic shutter support, Auto Gain Control , White Balance- Auto, Back Light Compensation, Multi zone Privacy Masking, HLC, Digital Watermarking				
	3) Compression (Minimum): Video:- H.265 or better, Audio:- G.711U/A, G.711Mu, G.726, AAC, G.723				
	4) Wide Dynamic Range:- WDR (120dB or more)				
	5) Digital Noise Reduction:- DNR (3D) On /Off				
	6) Video Streaming & Frame Rates :- Triple streaming , configurable Main stream: 4MP (2560×1440)25/30fps , Sub streams minimum: 720P@25/30 fps				
	7) Image Setting: Rotate Mode, saturation, brightness, contrast, sharpness adjustable through client software or web browser, Edge Analytics: Tripwire, Intrusion, Motion Detection				
	8) Cyber Security: AES 256-bit Encryption, Configuration encryption, trusted execution, Digest, security logs, account lockout, video encryption, IP/MAC filtering, HTTPS, trusted upgrade				

S. No	DESCRIPTION	UNIT	QTY	Rate	Amount in Rs (With GST@ 18%)
	9) Onboard Storage: Camera should support built-in Micro SD/ SDHC/ SDXC Card slot upto 512 GB. It should be supplied with minimum 128GB memory Card.				
	10) Recording Management: Format SD, overwrite, storage management, video to NAS device,				
	11) Alarm Trigger : Motion/tampering detection; network disconnection detection; IP conflict detection; memory card state detection; memory space detection				
	12)Network Protocol: SFTP, IPv6, IPv4, DNS,RTCP, NTP, RTP, HTTP, HTTPS, SNMP TCP/IP, PPPoE, NFS, UDP, ICMP, SSL, DHCP, SMTP, RTSPS, unicast,				
	13) System Capability: ONVIF, Camera shall support open source VMS				
	14) Ethernet: 1 RJ 45 10/100 Ethernet port				
	15) Audio : It should support 1 x Built-In Mic and 1/1 Alarm In/ Out for External Mic. and Speakers as per site requirement.				
	16) Power Input: The camera should support simultaneous dual power input 12 VDC (via power adapter) and PoE (802.3af) to ensure continuous operation in the event of a failure in one power source.				
	17) Power Requirement: 12VDC/24 VDC/PoE (802.3af)/ePoE				
	18) Housing/ Enclosure:- IP67 weather proof, IK10, Metallic body				
	19) Operating Condition:- Ambient Temperature:- ()05°C to 50°C, humidity 95% (max) (non-condensing)				
	20) IR life: 40000 hours or higher				
	21) Video Bit rate: 32 KBPS - 8 MBPS or better				
	22) Standards: BIS with ER, STQC Certified, CE, FCC and RoHS				
15.1.1	4MP @ 25/30fps@1440P (2560 x 1440) Dome Camera with 2.8/ 3.6/ 6/8/12 mm fixed lens (as per site requirement).	Each	51	10365	528615
15.2	Supplying Installation Testing and Commissioning of 4MP IP IR Outdoor Bullet Camera having following specifications and features etc :-				
	1) Signal System: PAL/NTSC, Signal to Noise Ratio: > 50 dB,Camera should display Camera title, Date & Time in live & recorded video				
	2)Image Sensor: 1/2.8" or better progressive Scan CMOS get color image even at night condition(Minimum Illumination: 0.006 Lux@ F1.4, AGC ON, 0 lux with IR or better) True Day & Night High Performance Mechanical IR cut filter with auto switch, Integrated IR Source (Auto, Manual)- Inbuilt IR LED's with effective distance upto 50 meter or better and 30 meter for colour view in night, Imaging: 1/3s to 1/30000s electronic shutter support, Auto Gain Control , White Balance- Auto, Back Light Compensation, Multi zone Privacy Masking, HLC, Digital Watermarking.				
	3) Compression (Minimum): Video:- H.265 or better, Audio:- G.711U/A, G.711Mu, G.726, AAC, G.723				
	4) Wide Dynamic Range:- WDR (120dB or more)				
	5) Digital Noise Reduction:- DNR (3D) On/Off				
	6) Video Streaming & Frame Rates :- Triple streaming , configurable Main stream: 4MP (2560×1440)25/30fps Sub streams minimum: 720P@25/30 fps				
	7) Image Setting: Rotate Mode, saturation, brightness, contrast, sharpness adjustable through client software or web browser, Edge Analytics: Tripwire, Intrusion, Motion Detection				
	8) Cyber Security: AES 256-bit Encryption, Configuration encryption, trusted execution, Digest, security logs, account lockout, video encryption, IP/MAC filtering, HTTPS, trusted upgrade				
	9) Onboard Storage: Camera should support built-in Micro SD/ SDHC/ SDXC Card slot upto 512 GB. It should be supplied with minimum 128GB memory Card.				
	10) Recording Management: Format SD, overwrite, storage management, video to NAS device,				
	11) Alarm Trigger : Motion/tampering detection; network disconnection detection; IP conflict detection; memory card state detection; memory space detection				
	12)Network Protocol: SFTP, IPv6, IPv4, DNS,RTCP, NTP, RTP, HTTP, HTTPS, SNMP TCP/IP, PPPoE, NFS, UDP, ICMP, SSL, DHCP, SMTP, RTSPS, unicast,				
	13) System Capability: ONVIF, Camera shall support open source VMS				
	14) Ethernet: 1 RJ 45 10/100 Ethernet port				
	15) Audio : It should support 1 x Built-In Mic and 1/1 Alarm In/ Out for External Mic. and Speakers as per site requirement.				
	16) Power Input: The camera should support simultaneous dual power input—12 VDC (via power adapter) and PoE (802.3af)—to ensure continuous operation in the event of a failure in one power source.				
	17) Power Requirement: 12VDC/24 VDC/PoE (802.3af)/ePoE				
	18) Housing/ Enclosure:- IP67 weather proof, IK10, Metallic body				
	19) Operating Condition:- Ambient Temperature:- (-)05°C to 50°C, humidity 95% (max) (non-condensing)				
	20) IR life: 40000 hours or higher				
	21) Video Bit rate: 32 KBPS - 8 MBPS or better				
	22) Standards: BIS with ER, STQC Certified, CE, FCC and RoHS				
15.2.1	4MP @ 25/30fps@1440P (2560x1440) Outdoor Bullet Camera with 2.7 to 4 mm ~12 to 13.5mm or better Varifocal Motorized lens.	Each	10	23754	237540
15.3	Supplying Installation Testing and Commissioning of following Channel Network Video Recorder (NVR) with camera licenses to record for all channels having specifications and features etc as mentioned below :				
	1) Network Video Recorder Embedded/ Installed OS (Linux) along with Camera Licenses to record per NVR and to provide a live view, storage and simultaneously Multi-channel playback of all IP camera or more and must be ONVIF with minimum support of 384 Mbps incoming Bandwidth.				
	2) NVR should support video compressions : H.265 or better, H.264, MJPEG.				
	3) Must support 1 channel RCA Input, 2 channel RCA Output for Two-way Talk with G.711U/A, G.711u, PCM, G726 audio compressions.				
	4) Intelligent auto power on when power resumes after power outage.				
	5) Storage: It should support minimum 8 SATA Slots with 20TB capacity/ Slot and RAID support of RAID 0/1/5/6/10.				
	6) Connectivity Interface : 2 Nos. x 10/100/1000 Mbps Ethernet Ports, 1x RS485, 1x RS232, 1x eSATA Port				
	7) Backup Interface : Its should have 4 Nosx USB port (2x USB3.0, 2xUSB2.0)				
	8) Video Output Ports: 2x HDMI and 2 VGA				
	9) Alarm Ports: It should have 16/8 Ch In/ Out ports to connect various type of external sensors and output devices like hooter/ Siren etc.				
	10) Email & SMS Altert options: Option for SMS/ Email Alerts to minimum 5 designated mobile number for power failure, HDD failure, vandalism, tempring, network disconnection and panic				
	11) Web & Mobile Application: Web, Mobile app (For iPhone, iPad, Android Phone) for alerts and viewing.				
	12) Protocols: HTTP, HTTPS, TCP/IP, IPv4/IPv6, UDP, DHCP, DNS, SMTP, UPnP, IP Filter, PPPoE, FTP, DDNS, Alarm Server, IP Search, Multicast, Auto Registration, ONVIF (Profile T, Profile S, Profile G), CGI, SDK and OEM Cloud for remote monitoring without any public IP need.				
	13) Standards: CE, FCC, RoHS, BIS Certified				
	14) Power Supply : Should support AC100-240V, 50/60Hz Power supply.				
	15) Operating Condition : -5°C to 50°C, humidity 90% (max) (non-condensing)				
	16) The VMS application shall support all the features & functionalities of the offered cameras.				
	17) VMS should consist Licenses for all channels to record Cameras with General, motion detection, intelligent, alarm and POS recording modes. VMS should be provided with Camera Licenses , with no dependency of VMS licenses by binding with the MAC address of the cameras to achieve the functionality.				
	18) The NVR OEM shall be responsible for providing a mobile application compatible with both Android and iOS devices, enabling remote monitoring and playback of cameras/NVR footage.				
	19) The OEM must provide its own DDNS server hosted in India, eliminating the need for a public IP address for remote monitoring over the Internet.				
	20) Must support Continuous, Alarm, Motion, Instant, Panic Recording Mode				
	21) It should support Resolution: 32MP; 24MP; 16MP; 12MP; 8MP; 5MP; 4MP; 1080p; 720p; D1; CIF; QCIF				
	22) When alarm recording is enabled and an event occurs, you can click the alarm icon on monitoring page to view the alert details. The snapshot function is supported on monitoring and playback page				

S. No	DESCRIPTION	UNIT	QTY	Rate	Amount in Rs (With GST@ 18%)
	23) The Network Video Recorder (NVR) shall be configured to send email whenever a system message is created or an alarm event occurs. The email server shall be a valid SMTP server. Each recipient email address shall be configured to receive any combination of critical, warning, or informational messages or alarm notifications. When an alarm occurs, the email message includes the NVR name, time of alarm and a list of camera that is configured to record upon alarm				
	24) It should have Web and GUI interface.				
	25) Built-In Artificial Intelligence: NVR should have built-in AI -- 2 Channel face detection and recognition, - Minimum4 Channel perimeter protection, - Minimum 8 ChannelSmart Motion Detection				
	26) Face Recognition Database Capacity: It should support total Blacklist and Whitelist capacity of Minimum 20,000 Faces or more with Face Detection speed of 12 face images/sec and facility to add Name, gender, birthday, address, credential type, credential No., countries & regions and state to each face image.				
	27) Face & Human Attributes Search: Search Pictures/ Video by Gender, age group, glasses, expressions, face mask, beard, Top color, top type, hat, bag, age, gender and umbrella.				
	28) ANPR Capability: It should support ANPR Camera with License plate, plate color, vehicle body, vehicle model, vehicle logo, calling, seatbelt, vehicle registration location etc vehicle attributes.				
	29) Alarm Notifications based on: Motion detection, video tampering, video loss, scene changing, PIR alarm, Camera external alarm, Face detection, face recognition, perimeter protection (intrusion and tripwire), ANPR, people counting, stereo analysis, crowd distribution, heat map, Disk Full, Storage Error, IP Conflict and abnormal behavior of fan, cybersecurity exception				
	30) Alarm Notification should be linked with Recording, snapshots, Camera external alarm output, buzzer, logs, presets and email.				
	31) General AI Based Search: Search Pictures by channel, time, event type, target classification (Fall Detection, People Approach Detection, People No. Exception Detection, People Staying Detection, Violence Detection.				
	32) Smart playback function: Should support smart search for the selected area in the video and smart playback to improve the playback efficiency				
	33) VCA (Video Content Analytic): Should support multiple video contented analytics based on camera analytics				
	34) Analytics by NVR: Perimeter protection and face recognation				
15.3.1	64 Channel Network Video Recorder (NVR) having display split :- Main screen: 1/4/8/9/16/25/36/64, 2nd screen: 1/4/8/9/16	Each	1	82600	82600
15.4	Supplying, Installation, Testing and Commissioning following capacity Serveillance grade Hard Disk with upto 256MB/s Transfer Rate, 256 MB Cache, 7200 RPM Disk Speed, 3.5 inch form factor, SATA Interface, BSMI, ICES-003/NNB-003, CE, FCC, KC, Maghreb, RCM, UKCA, VCCI, CB-Scheme, TUV, UL Certifications.				
15.4.1	8TB (Terabytes)	Each	2	20119	40238
15.5	Supplying, Installation, Testing and Commissioning of following size LED display (LED monitor) industrial grade with 3840x2160 resolution or better, USB playback, bluetooth and miracast connectivity, 4X HDMI 2.0, DP 1.2, HDR 10/10+, brightness: 500-nits or better, Video wall mode should be available, contrast ratio: 1200:1, OPS slot, viewing angle (H/V): 170°/ 170°, response time less than 12ms, Display control shall be on monitor screen and programmable with remote (remote shall be supplied with system), Key Board, Optical Mouse, etc. as required.				
15.5.1	55 inch or larger	Each	2	82509	165017
	TOTAL AMOUNT WITH GST @18%				**55477299**