



15	Supplying, erection and testing of approved make electric Ceiling fan of double ball bearing complete with standard down rod, canopy, hanging shackle, Aluminium blades, without regulator, A.C. 230-250 volts including connections with all necessary material complete of approved as required conforming to IS :374/2019 with upto date amendments.					
(A)	Ceiling Fan Ornamental 1200 mm Sweep, with minimum air delivery 210 m <sup>3</sup> /min and service value ≥ 4.00 as per BEE.	10,000			NO	One Number
16	Supplying, erection and testing of approved make wall mounting fan oscillating type with base, blades, guard, speed regulator etc. AC 230-250 volts with connections and including raw bolt/anchor hole fastener etc. complete finished and as required.					
(A)	400 mm sweep	2,000			NO	One Number
17	Supplying and fixing of deluxe fresh air fan with louvers (ventilating fan) with self-closing louvers of decorative PVC blades mounting square frame of approved make complete with all necessary material as required					
(A)	300mm RPM1300/1400	4,000			NO	One Number
18	Supplying, erecting and testing of approved make exhaust fan heavy duty with mounting frame, blades AC 230-250 complete connection and including, frame bolt/anchor hole fasteners etc. complete finished and as required.					
(A)	300mm sweep RPM 900 / 1400	2,000			NO	One Number
(B)	450mm sweep RPM 900 / 1400	24,000			NO	One Number
19	Supplying, installation/fixing, and testing of approved make exhaust/fresh Air inline fan Ac 220-240V, 50 Hz size 150mm (6 inches) 23-25 watts including frame bolt/ anchor hole fastners etc. having fully copper winding motor, silent operation and delightful aesthetics complete including					
(A)	150mm (SS Finished)	10,000			NO	One Number
20	Supply and fixing Led tube rod comprising of LED tube with non-integral/integral driver, upto 6500K color temp having 40000 burning hrs life with minimum @ L 70, system lumen output should be minimum with system efficacy> 100 lm/Watt. LED driver PF> 0.95 & THD < 20%. The colour rendering index of LED light should be more than 70. Submission LM 79-08/IS16106 (2012), IEC60598, IEC61347/c connection wire, testing etc. to complete the job.					
(A)	Tube light LED 1 X 20/22Watt, Integral i/c batten aluminium body, PC diffuser.	12,000			NO	One Number
<b>PART-3: DISTRIBUTION BOARD / PANELS AND SWITCHGEARS</b>						
21	Supply, fixing, testing & commissioning of ISI Marked <b>Automatic Transfer Switches (ATS)</b> conforming to IEC : 60947-1 & IEC : 60947-6-1 with automatic inbuilt time delay 4 pole, 415 V with two earthing terminals if required.					
(A)	630 Amps. (With enclosure )	1,000			NO	One Number
(B)	800 Amps. (With enclosure )	1,000			NO	One Number
22	Supply, fixing, testing & commissioning of ISI marked and approved make of moulded case circuit breaker (MCCB) suitable for 3 phase, 3 pole, 50 Hz, 415 Volts, (Ics=100%Icu) AC supply <b>with thermal - magnetic release</b> having respective breaking capacity (KA) at 415 Volts cited against their range standard conforming to IS/IEC 60947-2					
(A)	MCCB 25kA current rating - <b>63 to 100Amp</b> & adjustable overload setting 80% -100% of In, adjustable short circuit setting 6-10 In 3 Pole	24,000			NO	One Number
(B)	MCCB 25kA current rating - <b>125Amp</b> & adjustable overload setting 80% -100% of In, adjustable short circuit setting 6-10 In 3 Pole	18,000			NO	One Number
(C)	MCCB 25kA current rating - <b>160Amp</b> & adjustable overload setting 80% -100% of In, adjustable short circuit setting 6-10 In 3 Pole	4,000			NO	One Number
(D)	MCCB 25kA current rating - <b>200Amp</b> & adjustable overload setting 80% -100% of In, adjustable short circuit setting 6-10 In 3 Pole	4,000			NO	One Number
(E)	MCCB 36kA current rating - <b>315Amp</b> & adjustable overload setting 80% -100% of In, adjustable short circuit setting 6-10 In 3 Pole	2,000			NO	One Number
23	Supply, fixing, testing & commissioning of ISI marked and approved make of moulded case circuit breaker (MCCB) suitable for 3 phase & N, <b>4 pole</b> , 50 Hz, 415 Volts, (Ics=100%Icu) AC supply <b>with microprocessor release</b> with inbuilt instantaneous protection & variable trip class 7.2 Ir & 6 Ir having respective breaking capacity (KA) at 415 Volts cited against their range standard conforming to IS/IEC 60947-2					
(A)	MCCB 50kA current rating - <b>800 Amps 4 Pole</b> & Micro-Processor Release, over load 40% - 100% x In & short circuit 1.5 - 8 x Ir, Adjustable.	2,000			NO	One Number
24	Supply, fixing, testing & commissioning of ISI marked and approved make of air circuit breaker (ACB) with microprocessor release with overload, short circuit, neutral protection, instantaneous, ground fault protection (LSING) Ics=Icu=Icw for 1sec for total selectivity, ambient temperature 50deg.C, In with breaking capacity of 50 kA/60kA/75kA, 4 pole, 415 Volts					
(A)	800Amp, manual, drawout 50kA	2,000			NO	One Number
(B)	1250Amp, manual, drawout 50kA	2,000			NO	One Number
(C)	2500Amp, manual, drawout 60kA	4,000			NO	One Number
25	Supply, fixing, testing & commissioning of ISI marked and accepted standard of miniature circuit breaker (MCB) of 'C' series with short circuit indication, suitable for 240/415 Volts 50 Cycle, 10 kA/15 kA Value AC supply conforming to IS : 8828 : 1996, IEC : 60898 :2002 & 60947-2 but without enclosures :-					
(A)	<b>Single pole</b>					
(i)	MCB SP 0.5Amp to 5Amp 10kA rating	36,000			NO	One Number
(ii)	MCB SP 6Amp to 32Amp 10kA rating	920,000			NO	One Number
(B)	<b>Double pole</b>					
(i)	MCB DP 6Amp to 32Amp 10kA rating	34,000			NO	One Number
(ii)	MCB DP For 40Amp 10kA rating	18,000			NO	One Number
(iii)	MCB DP 50Amp to 63Amp 10kA rating	15,000			NO	One Number
(iv)	MCB DP 125Amp 15kA rating	14,000			NO	One Number
(C)	<b>For Triple pole</b>					
(i)	MCB TP 0.5Amp to 5Amp 10kA rating	6,000			NO	One Number
(ii)	MCB TP 6Amp to 32Amp 10kA rating	42,000			NO	One Number
(iii)	MCB TP For 40Amp 10kA rating	18,000			NO	One Number
(iv)	MCB TP 50Amp to 63Amp 10kA rating	21,000			NO	One Number
(v)	MCB TP 80Amp 15kA rating	4,000			NO	One Number
(D)	<b>Four pole</b>					
(i)	MCB FP 0.5Amp to 5Amp 10kA rating	6,000			NO	One Number
(ii)	MCB FP 6Amp to 32Amp 10kA rating	45,000			NO	One Number
(iii)	MCB FP 50Amp to 63 Amp 10kA rating	38,000			NO	One Number
26	Supply, fixing, testing & commissioning of approved make powder coated sheet steel encloser SPN MCB DB inclusive of busbar, neutral bar, earth bar, connection copper wire not less than 16 sq.mm & two earth terminals etc. complete as per IS:13032(exclusive of MCB & isolator)-					
(A)	12 Way double door IP 43 protection	24,000			NO	One Number
(B)	16 Way double door IP 43 protection	12,000			NO	One Number
27	Supply, fixing, testing & commissioning of approved make TPN MCB DB metal double door IP 43 protection with provision for FP MCB/ Isolator/ RCCB/ RCBO as incomer and SP MCBs as outgoing inclusive of busbar, neutral bar, earth bar, connection copper wire not less than 16 sq.mm & two earth terminals etc. complete as per IS:13032(exclusive of MCB & isolator):					
(A)	4 Way (8+12)	4,000			NO	One Number
(B)	6 Way (8+18)	12,000			NO	One Number
(C)	8 Way (8+24)	4,000			NO	One Number
28	Supply, fixing, testing & commissioning of approved make vertical TPN MCB DB metal double door IP 43 protection with provision for FP MCB/Isolator/RCCB/RCBO as incomer and SP/TP MCBs as outgoing inclusive of busbar, neutral bar, earth bar, & two earth terminals etc. complete as per IS:13032(exclusive of MCB & isolator)					
(A)	8 Way (8+24)	2,000			NO	One Number
29	Supply, fixing, testing & commissioning of approved make, powder coated metal double door vertical TPN MCB DB IP 43 protection with provision for MCCB upto 160A TP/FP 36kA as incomer and space for SP/TP MCBs as outgoing (without MCCB/MCBs) inclusive of busbar &					
(A)	4 Way without MCCB	8,000			NO	One Number
(B)	8 Way without MCCB	1,000			NO	One Number
30	Supplying and installing of RCBOs (Residual current circuit breaker with overload and short circuit protection) ISI marked complete as per I.S. standard conforming to IEC:61009-1 & IS:12640-2, 240/415V 50 Hz with 10 kA short circuit withstand capacity for earth leakage, overload & short circuit protection including connection in existing enclosure in approved manner					
(A)	<b>DP (4 module)</b>					
(i)	2 pole 6Amp to 25Amp, 100mA sensitivity	24,000			NO	One Number
(ii)	2 pole 32Amp, 100mA sensitivity	10,000			NO	One Number
(iii)	2 pole 40Amp, 100mA sensitivity	4,000			NO	One Number
(iv)	2 pole 63Amp, 100mA sensitivity	6,000			NO	One Number
(B)	<b>FP (8module)</b>					
(i)	4 pole 25-32Amp, 100/300mA sensitivity	12,000			NO	One Number
(ii)	4 pole 40Amp, 100/300mA sensitivity	6,000			NO	One Number

	(iii) 4 pole 63Amp, 100/300mA sensitivity	10.000			NO	One Number	
31	Supplying and installing of SPDs (surge protection device) ISI marked complete as per I.S. standard conforming to IEC:61543 - 11 for direct & indirect lightning surges protection type 2 maximum discharge current (Imax) up to 70kA & type 1+2 (Imax) up to 100KA including connection in existing enclosure in approved manner as per specification.						
(A)	Type 2 : 40kA, 3P+N protection against indirect lightning & switching surges	2.000			NO	One Number	
(B)	Type 1+2 : 50kA, 3P+N protection against direct & indirect lightning surges	2.000			NO	One Number	
32	Fixing of MCB/MCCB/Isolator in sheet steel enclosure as required as per accepted practice, including mounting on busbar and cable connection etc. complete (labour only)						
(A)	MCB/Isolator SP/DP	1037.000			NO	One Number	
(B)	MCB/MCCB Isolator TP/TPN/FP	180.000			NO	One Number	
33	Labour charges for fixing sheet steel enclosures, <b>MCB/MCCBDB flush mounting type</b> , as per accepted practice, duly embedded and end plate completely flushed in wall, cable connection etc. complete :-						
	For item no :-						
(A)	27.11.1 to 27.11.7 ; 27.12.1 to 27.12.3 & 27.13.1	52.000			NO	One Number	
(B)	27.12.4 & 27.12.5 ; 27.13.2 to 27.13.4 ; 27.14.1 to 27.14.4 & 27.15.1 to 27.15.4	15.000			NO	One Number	
34	Supply and fixing of MPP - H heavy duty capacitor 415 Volt, 3 Ph., peak inrush current upto 250 x In, over current upto 1.8 x In(normal current), operating losses total not more than 0.35 W/KVAR, switching 8000 operation/year, as per IS:13340-1993, IS:13341-1992 of approved make as required as per specification						
(A)	1 to 4 kVAR bank	20.000			Per kVAR	One kVAR	
(B)	5 to 25 kVAR bank	500.000			Per kVAR	One kVAR	
35	Supply, fixing, testing & commissioning wall/floor mounted LT panel primer coated with powder coated paint & provided with required gasket for dust/vermin proof with degree of protection IP42 suitable for 415Volt 3 phase, 50 Hz, 4 wire system fabricated out of CRCA sheet upto 2 mm thick (1.6 mm for doors) duly compartmentalized for incomer, bus section, outgoing, cable alleys & CT, PT Ampere Metre, Volt Metre, selector switches, frequency Metre, phase indicating lamp, Energy Metre complete including cost of busbar supports, detachable cable gland plates, 2 earthing terminals, internal wiring & fixing of separately supplied MCBs, MCCBs, ACB, panel mounted changeover switch/SFLs, etc. as required but excluding cost of busbar strips, Ampere Metre, Volt Metre, selector switch as per approved design & specification	1800.000			KG	One Kilogram	
(A)	Supply and fixing of LT panel accessories of approved make in existing LT panel including connections etc. as required as per specification.						
(i)	Digital Ampere Metre with CTs with selector switch	5.000			Set	One Set	
(ii)	Digital Volt Metre with selector switch & HRC fuse	5.000			Set	One Set	
(iii)	Multifunction Meter	5.000			NO	One Number	
(iv)	Copper bus bar strips with PVC sleeves	100.000			KG	One Kilogram	
(v)	Aluminium bus bar strips with PVC sleeves	190.000			KG	One Kilogram	
(vi)	LED lamp indicator	60.000			NO	One Number	
36	Supplying and fixing of capacitor duty contactor of approved make in existing power factor/LT panel including connections etc.as required as per specification.						
(i)	Upto 3 kVAR 440V, 3Ph,50Hz, Aux contact-1NO	1.000			NO	One Number	
(ii)	For 5 kVAR 440V, 3Ph,50Hz, Aux contact-1NO	1.000			NO	One Number	
(iii)	For 10 kVAR 440V, 3Ph,50Hz, Aux contact-1NO	1.000			NO	One Number	
(iv)	For 15 kVAR 440V, 3Ph,50Hz, Aux contact-1NO	1.000			NO	One Number	
(v)	For 20 kVAR 440V, 3Ph,50Hz, Aux contact-1NO	1.000			NO	One Number	
(vi)	For 25 kVAR 440V, 3Ph,50Hz, Aux contact-1NO	1.000			NO	One Number	
(vii)	For 30 kVAR 440V, 3Ph,50Hz, Aux contact-1NO	10.000			NO	One Number	
37	Supplying and fixing of APFC relay 1A/5 A site selectable, measurement of individual current and voltage harmonic (THD), capacitor failure indication, In-built temperature sensor of approved make in existing power factor Panel including connections etc. as required as per specification as mentioned below :						
(A)	Automatic power factor relay 16 Steps 230V 144 x 144mm	1.000			NO	One Number	
38	Supplying and fixing of CT 1A/5A as per site selectable busbar dimension of approved make in existing main panel for power factor Panel including connections etc. as required as per	3.000			NO	One Number	
39	Supplying and fixing of analog time switch for automatic ON - OFF street light of approved make in existing LT panel including connections etc. as required as per specification	2.000			NO	One Number	
40	Supplying and fixing of contractor 2 Pole rating 240/415V .for ON - OFF street light of approved make in existing LT panel including connections etc. as required as per specification						
(A)	25A	2.000			NO	One Number	
41	Three phase voltage monitoring relay:- For protection of sensitive equipment against under/over voltages which are caused due to voltage fluctuations, neutral loss, phase reversals at the end of the utility transformers etc						
(A)	Supply, installation, testing and commissioning of electronic voltage monitoring relays for three phase applications shall be multifunctional type providing the flexibility of monitoring under voltage, over voltage, voltage fault memory, window mode, phase rotation and phase loss. The relay shall be based on positively safe logic. All the functions and values shall be adjusted by selector and trimmer on front side. With a supply voltage of 220 V AC-510 V AC and 6 Amp 1 CO cadmium free contact with a dielectric strength between supply and contacts of 2500 V AC and between open contacts 1000 V AC, it shall have colored LED's for visual indication and shall comply to EN standards EN 61004-2/3/4/5/6/11. The switch-off delay time shall be selectable in a range of 0.5 to 0 sec. The electrical life at rated load AC1 shall be 60X10 <sup>3</sup> cycles and shall work at an ambient temperature of -20 to +60 deg C. The mounting shall be on 35 mm DIN rail (EN 60715) and shall have necessary approvals like CE and GOST.	4.000			NO	One Number	
42	Lightning & surge protection for solar plants on the building roof for KW plants:- Type 1 + 2 SPD						
(A)	Supply, installation, testing and commissioning of surge arrester for protection of DC side(1,000V) of systems in photovoltaic applications against overvoltage caused by direct lightning strike – Imp 12.5 KA 10/350µs and induced overvoltage's upto Imax 30 KA, 8/20 µs and a protection level of 1.8 KV. Short circuit withstand current of 125 A. Has Visual indication of Healthy/Replace status onboard and remote, with Replaceable modules and Complies with prEN 50539-11:2010	2.000			NO	One Number	
43	<b>Panel thermostat</b>						
(A)	Supply, installation, testing and commissioning of 250 V AC operated panel thermostat shall have 1 NO in heating control and 1 NC in ventilation control , 10A, AgNi contact material and shall have wide temperature setting range -20 to +40 & +0 to +60deg C in heating/ventilation control. It shall have very small and compact size 17.5 mm wide and thermostat have snap action thermostatic bimetal sensor .The electrical life at rated load AC1 shall be 1 lakh cycles and shall work at an ambient temperature of -45 to +80 deg C. The mounting shall be on 35 mm DIN rail (EN 60715) and shall have necessary approvals like CE and GOST and EAC.	4.000			NO	One Number	
44	Supply and fixing as per specification caution/danger board of approved make with necessary material complete.						
(A)	Small size 200 X 150 mm for MV/LT	8.000			NO	One Number	
	<b>PART-4: EARTHING AND LIGHTNING ARRESTER</b>						
45	Supply and laying 4.0mm (8 SW/G) dia. G.I. wire including jointing etc. as required.	270.000			MTR.	One Meter	
46	Supply and laying 4mm dia. copper wire including soldering etc. as required.	210.000			MTR.	One Meter	
47	Supply and laying 25mm X 5mm G.I. strip at including jointing etc. as required.	340.000			MTR.	One Meter	
48	Providing and fixing 25mm X 5mm copper strip earth electrode as required	160.000			MTR.	One Meter	
49	Supply and laying 50mm X 6mm G.I. strip at 0.5 metre below ground level/surface as strip earth electrode including jointing etc. as required.	100.000			MTR.	One Meter	
50	Providing and fixing of <b>lightning conductor</b> final made of 18mm dia 500mm long bright nickel plated <b>copper tube</b> tapered having single prong at top with bright nickel plated brass base M10 for connection and intersection of flat or round conductor including holes, clamp complete as	6.000			NO	One Number	
51	Riveting/soldering and soldering of copper/G.I. Tape (with another copper/G.I. Tape, base of final or any other metallic object) as required	300.000			NO	One Number	
52	Providing and fixing copper tape 20mm X 3mm thick on parapet and surface of wall of lightning conductor as required (for horizontal runs)	710.000			MTR.	One Meter	
53	Providing and fixing copper tape 20mm X 3mm thick on parapet and surface of wall of lightning conductor as required (for vertical runs)	70.000			MTR.	One Meter	
54	Providing and fixing "Testing Joint" made by 20mm X 3mm thick copper strip 125mm long with 4 Nos of tinned Brass bolts, Nut, check nuts and spring washers etc. complete as required.	6.000			NO	One Number	
55	Supply and erection of approved make safe earthing electrode consisting pipe-in-pipe technology as per IS 3043-1987 made of corrosion free copper bonded pipes with constant ohmic value surrounded by highly conductive compound with high charge dissipation suitable for effective and maintenance free earthing in earth pit of minimum bore dia. 200mm size, as						

(A)	With 3 metre pipe of 80mm outer dia., 40mm inner dia and 14mm terminal dia. In soft/hard rock/marshy soil with 50 kgs. (two bag) back filling bentonite compound UL listed and confirm to relevant International/Indian standards around electrode upto ground level.	40.000			NO	One Number	
56	Providing back filling bentonite compound suitable for safe earthing device. The product should be UL listed and confirm to relevant International/Indian standards.	1000.000			KG	One Kilogram	
57	Supply and installation of polycarbonate heavy duty pit cover tested for 5000Kg SWL for earth electrode at ground level size 300x300x155 mm with lockable lid.	40.000			NO	One Number	
<b>PART-5: RACEWAYS AND CABLE TRAY</b>							
58	Supply, installation, testing and commissioning of G.I. floor raceway of mention below sizes 1/3 compartments including all necessary civil works.						
(A)	75 x 38 x 1.2 mm	100.000			MTR.	One Meter	
(B)	100 x 38 x 1.2 mm	180.000			MTR.	One Meter	
(C)	150 x 38 x 1.2 mm	140.000			MTR.	One Meter	
59	Supply, installation, testing and commissioning of G.I. junction box for duct entry 1/3 compartments junction box (frame & trap) including all necessary civil works.						
(A)	150 x 150 x 65 - 90mm	26.000			NO	One Number	
(B)	225 x 225 x 65 - 90mm	29.000			NO	One Number	
60	Supply, installation, testing and commissioning of G.I. cross over/junction box for duct entry 1/3 compartments junction box c/w fly overs (frame & trap) including all necessary civil works.						
(A)	225 x 225 x 65 - 90mm	16.000			NO	One Number	
(B)	300 x 300 x 65 - 90mm	14.000			NO	One Number	
61	Supply, installation, testing and commissioning of G.I. coupler for under floor M-Tracks 38mm duct size wherever required.	420.000			NO	One Number	
62	Supply, installation, testing and commissioning of G.I. fixing bracket wherever required for under floor M-Tracks of duct size as mentioned below :-						
(A)	75 X 25 mm	60.000			NO	One Number	
(B)	100 X 25 mm	100.000			NO	One Number	
(C)	150 X 25 mm	80.000			NO	One Number	
63	Supply and erection of hot dip G.I. cable tray perforation not more than 17.5% for specific dimensions along with tees, bends. The cable tray shall be hang from ceiling/ fixed to wall with necessary angle/flat iron/hanging rod, for ceiling suspensions, clamp, anchor fastener, nuts, bolts, washers, not more than 1.0 mtr. apart complete as per specification to complete the job.						
(A)	100 x 50 x 1.6mm thick	400.000			MTR.	One Meter	
(B)	300 x 50 x 1.6mm thick	360.000			MTR.	One Meter	
(C)	450 x 50 x 2 mm thick	150.000			MTR.	One Meter	
(D)	600 x 50 x 2 mm thick	260.000			MTR.	One Meter	
<b>PART-6: CABLES AND TERMINATION</b>							
64	Supply and fixing of multi core round FRLSOH / FR-LSHH PVC insulated copper (flexible) conductor & PVC sheathed cables 1100Volts as per IS:694-1990 of approved make						
(A)	(50/0.25 mm) Three core 2.5 sq.mm.	1800.000			MTR.	One Meter	
(B)	(56/0.3 mm) Three core 4.0 sq.mm.	1200.000			MTR.	One Meter	
65	Supply of XLPE insulated FRLSOH / FR-LSH heavy duty power cable conforming IS-7098 (Part I) 1988, 1100 Volt grade, 2/3/4/8/10/12 core ISI marked with copper stranded/solid conductor.						
(A)	<b>Armoured 3 core</b>						
(i)	2.5 sq. mm.	700.000			MTR.	One Meter	
(ii)	4 sq. mm.	370.000			MTR.	One Meter	
(B)	<b>Armoured 4 core</b>						
(i)	2.5 sq. mm.	450.000			MTR.	One Meter	
(ii)	4 sq. mm.	390.000			MTR.	One Meter	
(iii)	6 sq. mm.	450.000			MTR.	One Meter	
(iv)	10 sq. mm.	670.000			MTR.	One Meter	
(v)	16 sq. mm.	680.000			MTR.	One Meter	
(vi)	25 sq. mm.	320.000			MTR.	One Meter	
66	Supply of XLPE insulated power cable (conforming IS-7098 Part-I) 1100 Volt grade, 1 core/2 core/3½ core/4 core ISI marked with alu. stranded /solid conductor						
(A)	<b>Unarmoured 1 core</b>						
(i)	70 sq. mm.	180.000			MTR.	One Meter	
(ii)	150 sq. mm.	200.000			MTR.	One Meter	
(B)	<b>Armoured 3 core</b>						
(i)	6 sq. mm.	300.000			MTR.	One Meter	
(ii)	10 sq. mm.	500.000			MTR.	One Meter	
(C)	<b>4 core armoured</b>						
(i)	25 sq. mm.	450.000			MTR.	One Meter	
(ii)	35 sq. mm.	320.000			MTR.	One Meter	
(iii)	50 sq. mm.	150.000			MTR.	One Meter	
(iv)	150 sq. mm.	100.000			MTR.	One Meter	
(v)	185 sq. mm.	60.000			MTR.	One Meter	
(vi)	300 sq. mm.	1400.000			MTR.	One Meter	
67	Supply of approved high-tension XLPE cable (conforming IS-7098/II/85) as per ISI standard 3 core XLPE cable 11 Kv grade armoured with alu. solid/stranded conductor ISI marked as required						
(A)	120 sq. mm.	100.000			MTR.	One Meter	
68	<b>Brass compression gland (double compression)</b>						
(A)	Supplying and fixing heavy duty <b>double compression</b> cable gland for P.V.C. insulated armoured cable with brass washer, rubber ring complete erected with cable and lead connection etc. as per specification complete.						
(i)	Gland size 22mm suitable for cable 2.3, 3½ & 4 x upto 6 sq. mm	180.000			NO	One Number	
(ii)	Gland size 22mm suitable for cable 2/3, 3½, 2¼ x 10 sq. mm or 2x 16 sq. mm	40.000			NO	One Number	
(iii)	Gland size 28mm for 3/4 x 16 sq. mm	40.000			NO	One Number	
(iv)	Gland size 32 mm for 2/3, 4 x 25 sq. mm OR 2/3, 4 x 35 sq. mm or 2/3¼ x 50 sq. mm.	20.000			NO	One Number	
(v)	Gland size 50 mm, 4 x 150 sq. mm, 4 x 185 sq. mm	8.000			NO	One Number	
(vi)	Gland size 70 mm, 4 x 240 sq. mm, 4 x 300 sq. mm	24.000			NO	One Number	
69	Providing & Making cable end termination with heat shrinkable jointing kit complete with all accessories including lugs suitable for 11 KV 3 core XLPE alum. conductor cable as required as per specification and as per accepted standard including connection testing complete.						
(A)	3 x 70-120 sq. mm. Outdoor	12.000			NO	One Number	
(B)	3 x 70-120 sq. mm. Indoor	8.000			NO	One Number	
70	Supplying and fixing ferrules as per IS - specification suitable for following size of cable for circuit identification including connection as required complete						
(A)	For conductor size-						
(i)	2.5 to 6.00 sq. mm	720.000			NO	One Number	
(ii)	10.00 sq. mm	80.000			NO	One Number	
(iii)	16.00 sq. mm	80.000			NO	One Number	
(iv)	25.00 sq. mm	40.000			NO	One Number	
(v)	35.00 sq. mm	20.000			NO	One Number	
(vi)	50.00 sq. mm	20.000			NO	One Number	
(vii)	150.00 sq. mm	16.000			NO	One Number	
(viii)	185.00 sq. mm	16.000			NO	One Number	
(ix)	300.00 sq. mm	96.000			NO	One Number	
71	Supplying and fixing crimping type alum. lugs as per I.S.S. specification suitable for following size of cable with alu./copper solid/stranded conductor evenly crimped with high/pressure tool and connected to switch gear/bus/M.C.C.B./M.C.B. etc. as required complete.						
(A)	6mm to 16 sq. mm	880.000			NO	One Number	
(B)	25 sq. mm	40.000			NO	One Number	
(C)	35 sq. mm	20.000			NO	One Number	
(D)	50 sq. mm	20.000			NO	One Number	
(E)	150 sq. mm.	16.000			NO	One Number	
(F)	180 sq. mm.	16.000			NO	One Number	
(G)	300 sq. mm.	96.000			NO	One Number	
72	Supplying & fixing pin terminal lugs as per ISS specification suitable for cable evenly crimped with high pressure tool & connection to switch gear terminal as required complete.						
(A)	<b>Copper lugs pin type</b>						
(i)	Upto 16 sq. mm conductor size	890.000			NO	One Number	
73	Supplying and installing double wall corrugated pipes (DWC) of HDPE (IS 14930 Part II - marked) for cable laid underground with necessary material and at required depth upto 90cm. below road/ground surface, excluding excavation, back filling with excavated material, ramming and making the surface good.						
(A)	63.00mm outside dia.	250.000			MTR.	One Meter	

(B)	110.00mm outside dia.	300.000			MTR.	One Meter	
(C)	210.00mm outside dia.	180.000			MTR.	One Meter	
74	Laying of one number armoured / unarmoured power cable 1:1 KV grade of size not exceeding 25 sq. mm in the existing RCC hume/stone ware/G.I. pipe/ DWC Pipe/ surface in existing trench	1870.000			MTR.	One Meter	
75	Laying of one number armoured / unarmoured power cable 1.1 KV grade of size exceeding 120 sq. mm but not exceeding 400 sq. mm. In the existing RCC Hume /Stone ware/G.I. Pipe/ DWC Pipe/ surface in existing trench as required.	1400.000			MTR.	One Meter	
76	Laying of one number armoured/unarmoured cable 1.1KV grade of size not exceeding 25 sq. mm on wall/truss with approved type of iron clamp etc. as required.	2570.000			MTR.	One Meter	
77	Laying of one number armoured/unarmoured cable 1.1KV grade of size exceeding 25 sq. mm but not exceeding 120 sq. mm on wall/truss with approved type of iron clamp etc. as required.	470.000			MTR.	One Meter	
78	Laying of one number armoured/unarmoured cable 1.1KV grade of size exceeding 120 sq. mm but not exceeding 400 sq. mm on wall/truss with approved type of iron clamp etc. as required.	160.000			MTR.	One Meter	
79	Laying of one number single core H.T armoured power cable of grade 11KV of size not exceeding 150 sq. mm direct in ground including excavation sand cushioning, excluding protective covering and refilling the trench etc. as required as per local electricity board norms	100.000			MTR.	One Meter	
<b>PART-7: SUBSTATION AND DG SETS</b>							
80	Supply of support for overhead line RS joist of I.S. standard including drilling of required hole etc. complete as required as per PGVCL norms and material should be approved from or from approved make list of PGVCL.						
(A)	H - Beam 152x152mm, Std weight 37.1 Kg/Mtr	208.000			MTR.	One Meter	
81	Supplying and drawing all aluminium alloy conductor (AAAC) of approved make conforming to IS 398-1979 Pt. IV, including binding at existing insulator, jointing, jumpering, tearing off, connecting etc. as required including clearing of obstacles (if any) as per PGVCL norms and material should be approved from or from approved make list of PGVCL.						
(A)	AAAC 0.075 sq inch (80 sq.mm Al. EQ.)- (Raccoon)	1.500			KM	One Kilo meter	
82	Supplying and drawing guard wire/earth wire/bearer wire 18.62 sq mm (4.87mm. dia/6swg) G.I. including stringing, binding at existing insulators or brackets, jointing, jumpering, connecting & cradle etc. as required and clearing of obstacles (if any) as per PGVCL norms and material should be approved from or from approved make list of PGVCL.	3.000			KM	One Kilo meter	
83	Erection of RS Joist pole/H' beam/steel tubular/steel rail pole of length exceeding 10 metres but not exceeding 15 metres in cement concrete M-10 (1 cement:3 core sand: 6 graded stone aggregate 40mm nominal size) base, foundation, muffing including excavation and back refilling etc. as required as per PGVCL norms and material should be approved from or from approved	16.000			NO	One Number	
84	Supplying and erection of stay set complete (galvanized) 19mm. dia x 1.8 metre long stay rod anchor plate of size 300 mm x 300 mm x 7.5mm thimble stay clamp, turn buckle (19mm dia x 600mm), 7/4.00mm dia G.I. stay wire etc. in cement concrete M-10 (1 Cement: 3 Coarse sand: 6 graded stone aggregate 40mm nominal size) foundation including excavation and refilling etc. as required as per PGVCL norms and material should be approved from or from approved	2.000			NO	One Number	
85	Supply, fabrication and erection of angle/channel/flat iron fitting for overhead line & sub-station etc such as 'D' bracket, cross arms, top clamp, 'V' cross arms, back/support clamp or other similar work etc. including nut bolts of required size, making holes, fabrication, welding, cutting, etc. and painting with one coat of red oxide paint & two coat of aluminium paint as required as per specification as per PGVCL norms and material should be approved from or from approved	1600.000			KG	One Kilogram	
86	Supplying and erection of 11KV ceramic pin insulator complete with long steel head G.I. pin, nut, washer etc. as required as per PGVCL norms and material should be approved from or from approved make list of PGVCL.	36.000			NO	One Number	
87	Supplying and erection of 11KV ceramic disc insulators for overhead lines with galvanized insulator fittings, ball and socket type, and complete with galvanized strain clamp, bolts, nuts, washers etc. as required as per PGVCL norms and material should be approved from or from approved make list of PGVCL.	24.000			NO	One Number	
88	Supplying and erection of single piece non-linear resistor type lightning arrester (set of 3 nos) for 3 wire, 11KV overhead lines/sub-station with rated voltage of 30KV (rms) with a nominal discharge current rating of 5 KA and complete with galvanized clamping arrangement, G.I. bolts, nuts, washer etc. as required as per PGVCL norms and material should be approved from or from approved make list of PGVCL.	2.000			Set	One Set	
89	Supplying installing, testing & commissioning of outdoor H.T., AB switch assembly set gang operated with brass contact parts, including required GI pipe operating rod, handle & locking arrangement on On-Off position conforming to IS complete with required material and installing on existing DP structure to complete the job as required as per specification.(Set of 3 nos.) as per PGVCL norms and material should be approved from or from approved make list of PGVCL.						
(A)	11KV, 600Amp	2.000			Set	One Set	
90	Supplying installing, testing & commissioning D.O. fuse assembly with brass part contact for 11/0.4 KV DP Structure set of 3 Nos. with fuse barrel i/c required fuse element & other materials as per specification on existing D.P. structure as required as per PGVCL norms and material should be approved from or from approved make list of PGVCL.						
(A)	11KV	2.000			Set	One Set	
91	Supply & fixing anti climbing device with 2 ply G.I. barbed wire 1 Kg. per pole complete as per MPMK/VCO. Specification as per PGVCL norms and material should be approved from or from approved make list of PGVCL.	16.000			NO	One Number	
92	Supply, laying and fixing of G.I. earth coil of 4mm dia G.I. wire having 120 turns of nearly 50mm dia. and 3 mt. long tail in existing pit duly earthed with pole etc complete as required as per specification as per PGVCL norms and material should be approved from or from approved	16.000			NO	One Number	
93	Supplying and fixing 11/0.4 KV enamel coated danger board size 200x250mm with clamp on existing HT/LT structure/poles as per PGVCL norms and material should be approved from or from approved make list of PGVCL.	16.000			NO	One Number	
94	Supplying, installing, testing and commissioning of 11/0.4 KV 3 Phase 50 cycle oil immersed, naturally cooled, outdoor type transformer connected delta on H.T. side and star on L.T. side, hand operated off load Tap changer switch, rating and diagram plate, two earthing terminal, lifting lugs, oil level gauge, drain valve with plug, temperature not exceeding 50°C on load, temperature dial gauge, Buchholz relay, oil conservator with drain plug, oil filling hole with plug, dehydrating silica gel breather on eye level, four unidirectional roller, arcing horns, explosion vent, terminal arrangement bushing on H.V. side and cable box on LV side, first filling of oil upto desired level and transformer installing on existing structure with all required materials arrangement as required ISI marked & as per IS specification or as per PGVCL norms.						
(A)	Energy efficiency (New level -1) Copper wound - 1250 KVA	2.000			NO	One Number	
95	Supplying and fixing limit switch with accessories & arrangement on existing HT/LT structure/poles AB switch handle for inter locking between distribution panel main incoming LT switch gear/ system as required to complete the job as per specification as per PGVCL norms and material should be approved from or from approved make list of PGVCL.	2.000			NO	One Number	
96	Supply & fixing fencing of chain link mesh 100 x 100 mm, 12 SWG GI wire for for D.P. structure electric sub-station switch yard including single post of angle iron size 50x50x5mm, 2.5 mt long should be provided upto 2.00 mt. apart or as required. The panel frame with required angle iron/ flat iron members/cross members including mesh welded in frame panel shall be erected between the posts. The angle iron post shall be erected in cement concrete M-15 (1:2:4) (20 mm graded metal) foundation, including excavation of pit and refilling the same. The fencing shall be provided with one entrance gate including locking arrangement as required as per specification. The height of fencing shall be 2 mt. above ground level. Fencing shall be painted with required shade as per specification as per PGVCL norms and material should be approved from or from approved make list of PGVCL.	60.000			SQ. MT.	One Square Meter	
97	Supply of rubber mat 2 x 1.0Mtr. 1100V tested	4.000			NO	One Number	
98	Supply of hand gloves 11KV tested	2.000			NO	One Number	
99	Supply of fiber discharge rod I/C connection copper lead tested	2.000			NO	One Number	
100	Supply of fiber D.O operating rod for 11KV tested	2.000			NO	One Number	
101	Supply of first aid box complete with medicine & bandage as per specification.	2.000			Set	One Set	
102	Supply of shock instruction chart duly framed with glass, as reqd.	1.000			NO	One Number	
103	Designing and construction of pedestal (plinth) for transformer of desired size including excavation in hard rock/soft rock, base concrete M-7.5 (1:4:8), 20mm metal and pedestal of RCC M-15 (1:2:4) including required tar steel reinforcement for required height as per IE rules from base concrete including shuttering and finishing with 10mm thick plaster in cement mortar 1:3 curing & white washing etc. complete as per specifications as per specification as per PGVCL norms and material should be approved from or from approved make list of PGVCL.	16.000			CUM	One Cubic meter	

104	Collection and spreading of metal dust, murum and 40mm graded hard metal in sub-station yard or as required as mentioned below -				
(A)	Metal 40 mm	4.000		CUM	One Cubic meter
105	Supplying, installation, testing and commissioning of triple pole outdoor type 11KV vacuum circuit breaker with outdoor control & relay panel with numerical static relay for feeder protection (1F). The installation of VCB shall be carried out in accordance with IS: 3072. The VCB shall be mounted on suitable size duly painted MS channel/angle iron structure with nut bolts and washer. The structure shall be fixed on existing cement concrete foundation. The complete work should be done as per IS specification.				
(A)	11 KV, 630A VCB	2.000		NO	One Number
106	Supplying, installation, testing and commissioning of single phase C.T./P.T. outdoor type 11KV with terminal box. The C.T./P.T. shall be mounted on existing structure fabricated with suitable size MS channel/angle iron structure with nut bolts and washer duly painted. The structure shall be fixed on existing cement concrete foundation as per IS specification as mentioned below.				
(A)	11 KV CT outdoor type 200-100/5 Amp	6.000		NO	One Number
107	Supplying, installation, testing and commissioning of single phase C.T./P.T. outdoor type 11KV with terminal box. The C.T./P.T. shall be mounted on existing structure fabricated with suitable size MS channel/angle iron structure with nut bolts and washer duly painted. The structure shall be fixed on existing cement concrete foundation as per IS specification as mentioned below.				
(A)	11 KV/110V single phase PTs oil immersed	2.000		NO	One Number
108	Supplying, installation, testing and commissioning of indoor control relay panel shall consisting of ammeter, voltmeter, selector switch, auxiliary relays for anti-pumping device, trip and alarm of buchholz relay, oil and winding temperature circuit, electronic hooter, 230 V AC to 110 V DC power pack with charging equipment for closing, tripping and indication, triple pole IDMTL trip O/C and one E/F delay with current setting range 50-200% and 10-50%, push button high speed trip relay etc. complete as per IS specification.	2.000		NO	One Number
109	Supply, installation, testing & commissioning of HT trivector energy meter, DLMS compliant category-A (for substation/feeder metering energy audit), 3 phase 4 wire, 110 Volts, 5 Amp, accuracy class 0.5S with GSM (GPRS compatible) modem suitable for required C.T. including uPVC box/sheet metal box with TTB duly tested from PGVCL.	1.000		NO	One Number
110	Supply, installation, testing and commissioning of 'Silent Type' diesel generating set comprising with diesel engine water cooled, Synchronous alternator, (with AMF control panel), acoustic enclosure, battery with charger and related accessories including exhaust pipe 'B' class with insulation as per CEMD specification and CPCB - IV Norms				
(A)	Supply, installation, testing and commissioning of diesel generating set three phase, water cooled with AMF control panel, <b>300/320 KVA, 415V.</b> With electronic governor.	1.000		NO	One Number
111	AMF Panel specs are:- 500A thermal magnetic based with o/c/s/c release TP mccb with control mcb's, current transformer CL-1, 15VA, four pole contactor of 240V AC, 2NO+2NC, indicating lamps of RYB, bush button , digital MFM (KW/KWH/PF/AVI/F), DC Ameter , 4 Point amari annunciator with inbuilt hooter, AMF contolter with Aux. relay coil for 24V AC 4 C/O 14 pin etc as required for AMF opeation.				
(A)	Supply, installation, testing and commissioning of diesel generating set three phase, water cooled with AMF control panel, <b>750 KVA, 415V.</b> With electronic governor. AMF Panel specs are:-1250A four pole EDO breaker, current transformer CL-1, 10VA, four pole contactor of 240V AC, 2NO+2NC, indicating lamps of RYB, bush button , digital ameter , volt meter, freq. meter, DC 12 a meter , DC voltmeter , voltage monitoring relay, Aux. relay , Aux contactor, auto manual switch, on delay timer , 4 Point amari annunciator with inbuilt hooter, AMF contolter with Aux. relay coil for 24V AC 4 C/O 14 pin etc as required for AMF opeation.	1.000		NO	One Number
<b>PART-8 : UNINTRRUPTIBLE POWER SUPPLY SYSTEM</b>					
112	Supply, installation, testing and commissioning of UPS with isolation transformer & battery for backup, minimum load power factor 0.8,power factor 0.99, having OVCD (over voltage cut-off device), having CVCF (constant voltage constant frequency, bypass parameters configurable, 2 stage charging/constant current/float charge), having temperature compensated charger, Fan speed control, digital signal processor controller, total harmonic distortion (current)-THDI (<10% @50% R Load, Input 1 phase voltage 230v, voltage range 110-300v, Output voltage (220V/230V/240V/± 1%), surge protection minimum 5KV, Total harmonic distortion Voltage (THDv) <3% linear load, <5% nonlinear load, 90 % AC/AC efficiency, Over load capacity(105-110%: <3min, 111-130%: 30Sec), operating temperature with full load 0-40°C, communication features (RS232, USB com port, Intelligent slot(optional). UPS installation with all required material arrangements as required as per IS specification.				
(A)	5 KVA (1 phase input & 1 phase output)				
(I)	For 30 minute backup, min. 4000 VAH	2.000		NO	One Number
113	Supply, installation, testing and commissioning of UPS with isolation transformer & battery for backup, having three phase input with ground (R-Y-B-N-G), Voltage range 190v AC-478v AC (based on load %), line low transformer (0-50% :190v/51-100% : 305v ± 3% VAC), line low comeback +25 - 35 VAC ( ± 3%), line high transfer 478 VAC ( ± 3%), line high comeback 461 VAC ( ± 3%), frequency range 46 - 54 Hz, power factor 0.99, Total harmonic distortion (current)-THDI (<5% with full load, having output voltage 220 VAC/230 VAC/240 VAC, surge protection minimum 5KV, voltage regulation ± 1%, frequency 50 Hz ± 0.1 Hz, Synchronization range 46 - 54 Hz, voltage distortion ≤ 2 % (linear load) & ≤ 5 % (nonlinear load), having pure sine wave 3 : 1, efficiency (AC -AC) 94%, power factor 0.9, having inbuilt isolation transformer, over load 101 - 109% : 5 Min, 110 - 129% : 1 Min, 130 - 150% : 10 sec, having SMF/VRLA battery type, transfer time line mode to battery mode 0 ms, inverter to bypass, ECO mode 0 ms, bypass to inverter 0 ms, ECO to inverter mode < 10 ms, when bypass voltage of frequency is out of range, having features Eco mode, Fan speed control, EPO function, frequency converter mode & parallel function up to 6 units. Operating temperature 0 - 45°C, noise level < 55 db @ 1 meter having display & indication features i.e. user friendly dot matrix LCD display, input : voltage & frequency, battery : voltage & level in %, internal DC bus voltage z frequency, current, power& load level in %), UPS status (operating mode/warning/fault/codes (fault & warnings), UPS settings (output voltage/ frequency/ bypass enable/disable/special function., UPS/CVCF/ECO.				
(A)	LED status (normal mode/load on battery/load on bypass/system fault), Audible alarm (main failure alarm, low battery alarm, UPS warning, overload, fault & bypass mode etc.), protections (advance electronic protection for device, safety backed with MCBs, fast acting fuses, high speed pulse blanking, electronic overvoltage/under voltage), connections (terminal block for input/bypass/battery & output), static bypass, communication interface RS 232/USB port for software interface, intelligent slot for SNMP (optional). UPS installation with all required material arrangements as required as per IS specification.				
(A)	20 KVA with parallel redundancy protocol (3 phase input & 1 phase output)				
(I)	For 30 minute backup, min. 16000 VAH	5.000		NO	One Number
<b>PART-9 : ON GRID SOLAR PHOTO VOLTAIC POWER PLANT</b>					
114	Supply, installation, Testing and Commissioning of on grid Solar Photo voltaic Power Plant conforming to MNRE specifications as amended, consisting of Mono/Poly Crystalline silicon solar cells, net metering facility, necessary protections, earthing, mounted Aluminum/GI structure of suitable strength with following components complete as required:- a) Solar Photo voltaic Module of capacity 330Wp or above, manufactured in India, conforming to IS14286/IEC61215 ,IS/IEC61730-Part-1, IS/IEC61730-Part-2, Solar Photovoltaic Module conversion efficiency shall not be less than 16.5%. PV modules used in solar power plants/systems must be warranted for their out put peak watt capacity, which should not be less b) Power Conditioning Unit (PCU) of 350-800V DC Input voltage range and 400 VAC, three phase, 4wire, 50Hz±2.5Hz, output voltage suitable to generate AC Power with efficiency not less than 97%, total harmonic distortion less than 3% and suitable for ambient temperature from 0 to 50 degree C. The PCU shall adjust the voltage and frequency level to suit the Grid Voltage Frequency. c) Data Monitoring System complete with accessories. d)Fixing of Array junction box & Main junction box with IP65 protection and termination arrangement for incoming and outgoing cable along with glands, lugs and other accessories etc. as required. e) Lightning and surge voltage protection, f)Connections & Interconnections by supplying & fixing required size XLPE insulated copper conductor 1.1kV grade armoured power and control cables between solar modules, main power cable to grid supply PCU unit along with supplying & fixing of necessary channel/conduit lugs and other accessories etc	500.000		KW/p	One Kilowatt-peak
<b>PART-10 : LIGHTING FIXTURE</b>					

115	Supply, Installation, Testing & Commissioning of Recessed mounted trimless downlight Wallwasher shall have shall deliver a minimum system lumen output of 890-977lm or better, with a minimum system wattage of 12W and a minimum efficacy of 76-83lm/W or better, operating at a regulated DC current of no less than 400mA and achieving a minimum efficiency of >80% or better under standard conditions. The correlated color temperature (CCT) shall range from a minimum of 2700K to 5700K or better, with chromaticity maintained within a tolerance of no more than 3 SDCM (MacAdam) or better. The system's lifetime shall meet or exceed L80/B10 standards with a minimum operational expectancy of 50,000 hours at an ambient temperature of Ta-30°C or better, unified glare rating (UGR) of less than 10, and a color rendering index (CRI) exceeding 90 or better, driver shall support an input voltage of 220-240V~50/60Hz, with total harmonic distortion (THD) not exceeding 10% or better, and be compatible with On-Off, DALI 2.0, AD, TD, or BLE driver types, ensuring compliance with all specified operational parameters or better.	56.000			NO	One Number	
116	Supply, Installation, Testing & Commissioning of Recessed Wallwasher shall deliver a minimum system lumen output of 942lm or better, with a minimum system wattage of 13W and an efficacy of not less than 74.24lm/W or better, operating at a minimum regulated DC current of 300mA or better while achieving an efficiency of no less than 83% or better under standard conditions. The correlated color temperature (CCT) shall range from a minimum of 2200K to 5700K or better, with chromaticity maintained within a tolerance of no more than 3 SDCM (MacAdam) or better. The system's lifetime shall meet or exceed the L80/B10 standard, guaranteeing a minimum operational expectancy of 50,000 hours at an ambient temperature of Ta-30°C or better. The unified glare rating (UGR) value shall be specified as not applicable, while the color rendering index (CRI) must exceed 90 or better to ensure superior color accuracy. The driver shall support an input voltage of 220-240V~50/60Hz, with total harmonic distortion (THD) not exceeding 10% or better, and be compatible with driver types including On-Off, DALI 2.0, AD, TD, or BLE.	7.000			NO	One Number	
117	Supply, Installation, Testing & Commissioning of a Recessed Fixed Downlight shall deliver a minimum system lumen output in the range of 1328 to 1461lm or better, with a minimum system wattage of 21W and an efficacy not less than 64 to 70lm/W or better, operating at a regulated DC current of no less than 500mA or better while maintaining an efficiency of >80% or better under standard conditions. The correlated color temperature (CCT) shall be between a minimum of 2200K and 5700K or better, with chromaticity maintained within a tolerance of no more than 3 SDCM (MacAdam) or better. The system's lifetime shall conform to L80/B10 standards, ensuring a minimum operational expectancy of 50,000 hours at an ambient temperature of Ta-30°C or better. Optical characteristics shall include a beam angle of 54° (medium) or better, a unified glare rating (UGR) of less than 15 or better, and a color rendering index (CRI) exceeding 90 or better to ensure optimal performance and color accuracy. The driver shall support an input voltage of 220-240V~50/60Hz, with total harmonic distortion (THD) not exceeding 10% or better, and be compatible with driver types including On-Off, DALI 2.0, AD, TD, or BLE.	959.000			NO	One Number	
118	Supply, Installation, Testing & Commissioning of a Recessed Fixed Downlight shall deliver a minimum system lumen output in the range of 1328 to 1461lm or better, with a minimum system wattage of 21W and an efficacy not less than 64 to 70lm/W or better, operating at a regulated DC current of no less than 500mA or better while maintaining an efficiency of >80% or better under standard conditions. The correlated color temperature (CCT) shall be between a minimum of 2200K and 5700K or better, with chromaticity maintained within a tolerance of no more than 3 SDCM (MacAdam) or better. The system's lifetime shall conform to L80/B10 standards, ensuring a minimum operational expectancy of 50,000 hours at an ambient temperature of Ta-30°C or better. Optical characteristics shall include a beam angle of 54° (medium) or better, a unified glare rating (UGR) of less than 15 or better, and a color rendering index (CRI) exceeding 90 or better to ensure optimal performance and color accuracy. The driver shall support an input voltage of 220-240V~50/60Hz, with total harmonic distortion (THD) not exceeding 10% or better, and be compatible with driver types including On-Off, DALI 2.0, AD, TD, or BLE.	310.000			NO	One Number	
119	Supply, Installation, Testing & Commissioning of a Recessed Fixed Downlight shall deliver a minimum system lumen output in the range of 1328 to 1461lm or better, with a minimum system wattage of 21W and an efficacy not less than 64 to 70lm/W or better, operating at a regulated DC current of no less than 500mA or better while maintaining an efficiency of >80% or better under standard conditions. The correlated color temperature (CCT) shall be between a minimum of 2200K and 5700K or better, with chromaticity maintained within a tolerance of no more than 3 SDCM (MacAdam) or better. The system's lifetime shall conform to L80/B10 standards, ensuring a minimum operational expectancy of 50,000 hours at an ambient temperature of Ta-30°C or better. Optical characteristics shall include a beam angle of 54° (medium) or better, a unified glare rating (UGR) of less than 15 or better, and a color rendering index (CRI) exceeding 90 or better to ensure optimal performance and color accuracy. The driver shall support an input voltage of 220-240V~50/60Hz, with total harmonic distortion (THD) not exceeding 10% or better, and be compatible with driver types including On-Off, DALI 2.0, AD, TD, or BLE.	69.000			NO	One Number	
120	Supply, Installation, Testing & Commissioning of Trimless Downlight shall deliver a minimum system lumen output in the range of 700 to 812lm or better, with a minimum system wattage of 14W and an efficacy not less than 50 to 58lm/W or better, operating at a regulated DC current of no less than 500mA or better while achieving an efficiency of >70% or better under standard conditions. The correlated color temperature (CCT) shall range from a minimum of 2700K to 5700K or better, with chromaticity maintained within a tolerance of no more than 3 SDCM (MacAdam) or better. The system's lifetime shall conform to L80/B10 standards, providing a minimum operational expectancy of 50,000 hours at an ambient temperature of Ta-30°C or better. Optical features shall include a beam angle of 35° (narrow) or 52° (wide) or better, a unified glare rating (UGR) of less than 10 or better, and a color rendering index (CRI) exceeding 90 or better to ensure superior lighting quality and color accuracy. The driver shall support an input voltage of 220-240V~50/60Hz, with total harmonic distortion (THD) not exceeding 10% or better, and be compatible with driver types including On-Off, DALI 2.0, AD, TD, or BLE.	39.000			NO	One Number	
121	Supply, Installation, Testing & Commissioning of Recessed Fixed Downlight shall deliver a minimum system lumen output in the range of 823 to 873lm or better, with a minimum system wattage of 13W and an efficacy not less than 64 to 70lm/W or better, operating at a regulated DC current of no less than 300mA or better while maintaining an efficiency of >83% or better under standard operating conditions. The correlated color temperature (CCT) shall range from a minimum of 2200K to 5700K or better, with chromaticity maintained within a tolerance of no more than 3 SDCM (MacAdam) or better. The system's lifetime shall comply with L80/B10 standards, ensuring a minimum operational expectancy of 50,000 hours at an ambient temperature of Ta-30°C or better. Optical characteristics shall include beam angles of 35° (narrow), 53° (medium), and 70° (wide) or better, with a unified glare rating (UGR) of less than 10 for narrow, less than 13 for medium, and less than 25 for wide configurations, or better, ensuring optimal light distribution and visual comfort. The color rendering index (CRI) shall exceed 90 or better for accurate and vibrant color representation. The driver shall support an input voltage of 220-240V~50/60Hz, with total harmonic distortion (THD) not exceeding 10% or better, and shall be non-while being compatible with driver types including On-Off, DALI 2.0, AD, TD, or BLE.	12.000			NO	One Number	
122	Supply, Installation, Testing & Commissioning of Recessed Downlight shall deliver a minimum system lumen output of 4218lm or better, with a minimum system wattage of 50W and an efficacy not less than 88.5lm/W or better, operating at a regulated DC current of no less than 1200mA or better, maintaining an efficiency of >80% or better under standard operating conditions. The correlated color temperature (CCT) shall range from a minimum of 2700K to 5700K or better, with chromaticity maintained within a tolerance of no more than 3 SDCM (MacAdam) or better. The system's lifetime shall meet or exceed L80/B10 standards, ensuring a minimum operational expectancy of 50,000 hours at an ambient temperature of Ta-30°C or better. The optical performance shall include a beam angle of 57° (medium) or better, with a unified glare rating (UGR) of less than 10 or better to ensure visual comfort. The color rendering index (CRI) shall exceed 90 or better for superior color accuracy. The driver shall support an input voltage of 220-240V~50/60Hz, with total harmonic distortion (THD) not exceeding 10% or better, and be compatible with driver types including On-Off, DALI 2.0, AD, TD, or BLE.	40.000			NO	One Number	

123	Supply, Installation, Testing & Commissioning of 2x trimless Downlight shall provide a minimum system lumen output in the range of 460 to 703lm or better, with a minimum system wattage of 14W and an efficacy not less than 32 to 49lm/W or better, operating at a regulated DC current of no less than 500mA or better, ensuring an efficiency of >70% or better under standard operational conditions. The correlated color temperature (CCT) shall range from a minimum of 2700K to 5700K or better, with chromaticity maintained within a tolerance of no more than 3 SDCM (MacAdam) or better. The system's lifetime shall meet or exceed L80/B10 standards, ensuring a minimum operational expectancy of 50,000 hours at an ambient temperature of Ta-30°C or better. The optical performance shall include beam angles of 40° (narrow) and 54° (wide) or better, with unified glare rating (UGR) values of less than 11 for narrow and less than 25 for wide configurations or better, ensuring minimal visual discomfort. The color rendering index (CRI) shall exceed 90 or better to guarantee accurate color representation. The driver shall support an input voltage of 220-240V-50/60Hz, with total harmonic distortion (THD) not exceeding 10% or better, and be compatible with driver types including On-Off, DALI 2.0, AD,	44.000			NO	One Number	
124	Supply, Installation, Testing & Commissioning of Recessed Mounted Downlight shall operate with a minimum system wattage of 15W, delivering a minimum lumen output of 1650lm or better. The system's efficacy shall ensure optimal energy efficiency, providing consistent illumination with a beam angle categorized as diffused. The correlated color temperature (CCT) shall range from a minimum of 3000K to 6000K or better, offering versatile lighting solutions. The color rendering index (CRI) shall exceed 80 or better, ensuring accurate color representation. The driver shall operate at a regulated current of 350mA, with driver options including DALI and BLE, ensuring compatibility with various control and dimming systems. The system shall be designed for an ingress protection rating of IP20, suitable for indoor use where protection against solid objects larger than 12mm is required but with no protection against water. The driver shall support both On-Off, DALI 2.0, AD, TD, or BLE control systems, ensuring seamless integration into existing systems for easy operation and control.	64.000			NO	One Number	
125	Supply, Installation, Testing & Commissioning of Recessed Mounted Downlight shall operate with a minimum system wattage of 24W, delivering a minimum lumen output of 2208lm or better, with an efficacy of no less than 92lm/W or better. The correlated color temperature (CCT) shall range from a minimum of 3000K to 6000K or better, providing versatile lighting solutions. The system shall have a beam angle of 120° or better to ensure broad and uniform light distribution. The driver shall operate at 650mA and ensure a minimum LED lifetime of >50,000 hours at L70/B10 standards under normal operating conditions, with an operating temperature range of 0°C to 50°C. The luminaire shall be rated with an ingress protection of IP20, indicating protection against solid objects larger than 12mm but not protected against water. The input voltage shall be compatible with 220V-240V/50-60Hz, and the driver shall support various types including On-Off, DALI 2.0, AD, TD, or BLE, ensuring compatibility with different control and dimming systems.	187.000			NO	One Number	
126	Supply, Installation, Testing & Commissioning of ceiling suspended pendant light shall operate with a minimum wattage of 25W, delivering a minimum lumen output of 3000lm or better to provide sufficient illumination for various applications. The color rendering index (CRI) shall exceed 90, ensuring excellent color accuracy and visual clarity. The correlated color temperature (CCT) shall range from a minimum of 2700K to 6000K or better, offering flexibility in creating different lighting atmospheres. The optical beam direction shall be fixed to ensure controlled and precise light distribution. The driver shall have an input voltage range of 220V-240V, making it compatible with standard electrical systems. The driver shall support multiple control systems, including On-Off, DALI 2.0, AD, TD, and BLE, to ensure compatibility with advanced lighting control protocols for seamless integration and optimal functionality.	80.000			MTR.	One Meter	
127	Supply, Installation, Testing & Commissioning of ceiling suspended pendant light shall operate with a minimum wattage of 38W, providing a lumen output of 3000lm or better for effective illumination. The color rendering index (CRI) shall exceed 90, ensuring high color accuracy and visual appeal. The correlated color temperature (CCT) shall range from 2700K to 6000K or better. The optical beam direction shall be fixed, ensuring controlled and precise light distribution. The light fixture shall have a total length of 1523mm, delivering a well-balanced and efficient light spread. The driver shall operate within an input voltage range of 220V-240V, ensuring compatibility with standard electrical systems. Additionally, the driver shall support various control systems, including On-Off, DALI 2.0, AD, TD, and BLE	37.000			MTR.	One Meter	
128	Supply, Installation, Testing & Commissioning of Pendant Mounted Linear Downlight shall provide a minimum lumen output ranging from 2300lm to 2500lm, depending on the configuration. The system's wattage shall be 18W per meter for uplight and 36W per meter for downlight. The efficacy shall range from 85 to 95lm/W, ensuring optimal energy efficiency. The DC current shall be 500mA for uplight and 1000mA for downlight, designed to ensure reliable operation. The system efficiency shall be greater than 75% to 90%, providing consistent performance. The correlated color temperature (CCT) shall range from 3000K and 6500K or better, offering flexibility for different lighting environments. The Macadam shall be within 3SDCM for color consistency. The lifetime shall be L80/B10, ensuring over 50,000 hours of operation at a temperature of Ta-30°C. The downlight beam angle shall be 86° with an opal lens and 65° with a prismatic lens, while the uplight beam angle shall be 118° with a Batwin lens. The system shall have a UGR value of less than 19 for downlight, ensuring reduced glare. The light fixture shall have a total length of 2302mm. The CRI shall exceed 80 for uplight and exceed 90 for downlight, ensuring accurate color rendering. The driver shall support an input voltage of 220-240V-50/60Hz and must have a total harmonic distortion (THD) of less than 10%. Additionally, the driver shall be compatible with On-Off, DALI 2.0, AD, TD, or BLE	2.000			NO	One Number	
129	Supply, Installation, Testing & Commissioning of Pendant Mounted Linear Downlight shall provide a minimum lumen output ranging from 2300lm to 2500lm, depending on the configuration. The system's wattage shall be 18W per meter for uplight and 36W per meter for downlight. The efficacy shall range from 85 to 95lm/W, ensuring optimal energy efficiency. The DC current shall be 500mA for uplight and 1000mA for downlight, designed to ensure reliable operation. The system efficiency shall be greater than 75% to 90%, providing consistent performance. The correlated color temperature (CCT) shall be adjustable between 3000K and 6500K, offering flexibility for different lighting environments. The Macadam shall be within 3SDCM for color consistency. The lifetime shall be L80/B10, ensuring over 50,000 hours of operation at a temperature of Ta-30°C. The downlight beam angle shall be 86° with an opal lens and 65° with a prismatic lens, while the uplight beam angle shall be 118° with a Batwin lens. The system shall have a UGR value of less than 19 for downlight, ensuring reduced glare. The light fixture shall have a total length of 5102mm. The CRI shall exceed 80 for uplight and exceed 90 for downlight, ensuring accurate color rendering. The driver shall support an input voltage of 220-240V-50/60Hz and must have a total harmonic distortion (THD) of less than 10%. Additionally, the driver shall be compatible with On-Off, DALI 2.0, AD, TD, or BLE	1.000			NO	One Number	
130	Supply, Installation, Testing & Commissioning of ceiling suspended pendant light shall operate with a minimum wattage of 22W, providing a lumen output of 3000lm or better for effective illumination. The color rendering index (CRI) shall exceed 90, ensuring high color accuracy and visual appeal. The correlated color temperature (CCT) shall range from a minimum of 2700K to 6000K or better. The optical beam direction shall be fixed, ensuring controlled and precise light distribution. The light fixture shall have a total length of 921mm, delivering a well-balanced and efficient light spread. The driver shall operate within an input voltage range of 220V-240V, ensuring compatibility with standard electrical systems. Additionally, the driver shall support various control systems, including On-Off, DALI 2.0, AD, TD, and BLE	1.000			NO	One Number	



131	Supply, Installation, Testing & Commissioning of Pendant Mount Downlight shall have a minimum wattage of 7W, delivering a lumen output of 630lm or better. The efficacy shall be at least 90lm/W, ensuring optimal energy performance. The system shall support adjustable CCT (Correlated Color Temperature) shall range from a minimum of 3000K to 6500K or better, providing flexibility for different lighting environments. The beam angle shall be selectable between 15°, 24°, and 36°, offering versatility in light distribution. The driver shall operate at a current of 150mA, ensuring proper operation and long-lasting performance. The LED lifetime shall be L70/B10, exceeding 50,000 hours, at an ambient temperature of 0°C to 50°C. The system shall have an ingress protection (IP) rating of IP20, suitable for dry indoor environments. The driver shall support On-Off, DALI 2.0, AD, TD, or BLE control systems for integration with advanced control protocols. The driver shall be compatible with an input voltage range of 220-240V~50/60Hz and shall maintain a total harmonic distortion (THD) of less than 10%, ensuring high power quality and minimal electrical interference.	15.000			NO	One Number	
132	Supply, Installation, Testing & Commissioning of Pendant mounted downlight shall deliver a minimum of 635lm with a total wattage of 8W, ensuring efficient illumination with an efficacy of at least 79lm/W. The system shall operate with a DC current of 200mA, maintaining an efficiency greater than 90%. The CCT (Correlated Color Temperature) shall range from a minimum 3000K to 6500K or better. The system shall comply with a Macadam of 3SDCM, ensuring color consistency. The lifetime shall exceed 50,000 hours at an ambient temperature of Ta=30°C with L80/B10 performance. The beam angle shall be 45°, offering a balanced light distribution. The UGR value shall be less than 10, ensuring low glare for visual comfort. The CRI (Color Rendering Index) shall be greater than 90, guaranteeing high-quality color rendering. The driver shall be compatible with an input voltage of 220-240V~50/60Hz, and the integration shall be non-. The system shall have a total harmonic distortion (THD) of less than 10% to maintain high power quality. The driver shall support On-Off, DALI 2.0, AD, TD, or BLE control systems.	15.000			MTR.	One Meter	
133	Supply, Installation, Testing & Commissioning of Recessed Mounted Linear Downlight shall feature a minimum wattage of 30W with a maximum LED lamp lumen output of 3000lm, ensuring efficient and bright illumination. The CCT (Correlated Color Temperature) shall range from 3000K to 6000K or better. The light fixture shall have a total length of 2500mm. The driver shall support advanced control systems, including On-Off, DALI 2.0, AD, TD, or BLE, enabling seamless integration with a wide range of control protocols. The driver shall be compatible with an input voltage range of 220-240V~50/60Hz and must maintain a total harmonic distortion (THD) of less than 10%, ensuring optimal power quality and minimizing electrical interference.	20.000			MTR.	One Meter	
134	Supply, Installation, Testing & Commissioning of Surface Mounted Linear wall washer shall provide a lumen output ranging from a minimum of 1466lm to a maximum of 1664lm, with a system wattage of 20W, ensuring effective lighting performance. The efficacy shall range from 77lm/W to 86lm/W, with a DC current of 500mA, delivering energy-efficient performance. The system shall feature a CCT(K) adjustable between 2700K and 5700K, offering flexibility in lighting ambience. The Macadam shall be 3SDCM, and the system shall have a lifetime of L80/B10 with a minimum of 50,000 hours at Ta=30°C. The UGR value shall be <19, providing uniform and glare-free illumination. The CRI shall be greater than 90, ensuring accurate color rendering. The driver shall support an input voltage of 220-240V~50/60Hz, with a THD of less than 10%. The driver type shall support On-Off, DALI 2.0, AD, TD, and BLE control protocols for advanced integration.	1.000			NO	One Number	
<b>PART-11: OUTDOOR LIGHTING FIXTURES AND POLES</b>							
135	Supply and fixing integral post top lantern LED fitting comprises of copper dust finish cast aluminium spigot and spun aluminium canopy fixed with opal polycarbonate, pipe arrangement for vertical mounting, open construction driver and accessories are wired upto terminal block. LED of 1 to 3 Watt each assembled on single MCPCB, having color temp upto 6500K & having 50000 burning hrs. life with minimum @ L 70, system lumen output should be minimum with efficacy>100lm/Watt. LED driver PF > 0.95 & surge protection 10KV. The colour rendering index of LED light should be more than 70. Submission LM 79-08/IS16106 (2012), IEC60598, IEC61347/c connection wire, testing etc. to complete the job.						
(A)	40 Watt LED, color temp 3000-6500k as required.	12.000			NO	One Number	
(B)	25 Watt LED, color temp 3000-6500k as required.	22.000			NO	One Number	
136	Supplying and fixing flood light with high power LED of 3 to 6 Watt each assembled on single MCPCB and additional unique peanut lens on each LED, system lumens output with efficacy>120 lm/Watt, luminaire having color temp upto 6500K & 50000 hrs. burning life with minimum @ L 70, The colour rendering index of LED light should be more than 70. Luminaire comprises of driver, PF > 0.95 & surge protection 10KV. Housing made of pressure die cast aluminium with heat resistant flat glass, IP65 protection. Submission LM 79-08/IS16106 (2012), IEC60598, IEC61347/c connection wire, testing etc. to complete the job.						
(A)	120Watt, color temp 3000-6500k as required.	20.000			NO	One Number	
(B)	150Watt, color temp 3000-6500k as required.	8.000			NO	One Number	
137	Supply, fixing & testing of approved make of LED integral type bollard cylindrical/square shape housing cast aluminium dome shape top cover fixed with cylindrical shape acrylic cover having base plate with holes for direct mounting complete with all accessories including preparation of foundation, fixing, connection etc. as required. LED of 1 to 3 Watt each assembled on single MCPCB, system lumens output with efficacy>90 lm/W, luminaire having color temp upto 6500K & 50000 burning hrs. life with minimum @ L 70, The colour rendering index of LED light should be more than 70. Luminaire, comprises of driver PF> 0.95 & surge protection 10KV. IP65 protection. Submission LM 79-08/IS16106 (2012), IEC60598, IEC61347/c connection wire, testing etc. to complete the job.						
(A)	Bollard LED 8-10 Watt cylindrical shape height > 700mm, color temp 3000-6000k	45.000			NO	One Number	
138	Supply & Fixing of Decorative LED Street Light of 1 to 3 watt with each, system lumens output with Efficacy>=135lm/W(@6500k), It's body made of Die cast aluminium using pressure die-casting process. Hole for coupling on pipes Ø 60 mm, for lateral installation. Silicon gasket ensures the IP protection. IP Rating - IP66. Power LED Module with high efficacy LED's on single Printed Circuit Board with metal core plate. Colour Rendering Index: Ra > 70. Electronic Power Supply for LED Module, which offers Protection against Short Circuit, Over- Voltage & Over- Current, with in-built surge protection upto 4kv (an additional surge protection device of 10kV also provided in-built the fixture). PF >0.95 and THD<10%. Lens cover in PC (IK09). Estimated LED Lifetime is L70 @ 1,00,000 hours minimum. LM79-80 report from LED manufacturer should be submitted. Safety test report as per IEC 60598-2-3; IEC 60598-1 / IS 10322 IEC 61347 /c connection wire, testing etc-Supporting Test Report from NABL approved lab, with 5 year on site warranty.						
(A)	40Watt, Color Temp 3000-6500k as required	25.000			NO	One Number	
(B)	60Watt, Color Temp 3000-6500k as required	18.000			NO	One Number	
(C)	80/90Watt, Color Temp 3000-6500k as required	10.000			NO	One Number	
139	Providing and erection on existing foundation 12.5 meter high mast lighting system suitable to install 6 No. 2 x 400 w M.H.S.V/LED flood light fitting and control gear with integral Power tool, weight 340 kg, comprising of 2 section of hot dipped galvanized materials as per BSEN ISO 1461 thickness 3 mm, dia 100mm & 360mm for top and bottom respectively, stress fitting arrangement on site with 350mm overlap dynamic loading to withstand max wind pressure as per -IS 875 part III, parameters for structural & foundation design must be taken from wind tunnel test & lightning protection of GI single spike R100mm at top and at base inside	2.000			NO	One Number	

	<p>control room, lightning protection or an angle iron column in way area in each station compartment with double internal lock with adequate size of MCB erected on PVC board complete with base plate of 25mm thick 520mm dia. and foundation bolts having 4 nos. bolts of 24mm dia, 750mm long (EN8 grade), Anchor plate 445 PCD, including accessories viz.</p> <p>(1) Lantern carriage of 50 NB ERW class-B, MS pipe covered with PVC sleeve suitable to carry 250kg. load and upto 6 fittings symmetrically.</p> <p>(2) Trailing copper cable 5x2.5 sq.mm, EPR insulated PCP sheathed.</p> <p>(3) Double drum/350kg winch having gear 53:1, oil bath (SAE90/140) arrangement.</p> <p>(4) 2 nos. stainless steel wire ropes 5mm dia (7/19) breaking load capacity 1450 kg.x 2.</p> <p>(5) Integral power tool 3-phase, 0.75 HP 2m/min single speed.</p> <p>(6) Feeder pillar fabricated out of 14 SWG CRCA sheet and comprise of incoming MCB 32 A TPN switch, HRC fuses, single dial timer, suitable size of contactors for lighting and power tool, 2 nos. outgoing, reversing switch for motor.</p> <p>(7) Foundation drawing, test certificate and guarantee certificate shall be provided by manufacturer. (without fixture and lamp)</p>					
<b>140</b>	<p>Providing and erection of black painted galvanized decorative designer poles in different section, top 60mm dia., bottom 140mm dia. with gold colour painted ornamental cast aluminium ring having lockable weather proof flush door junction box in bottom section, base plate dia. 290mm having 4 holes of 22mm dia. complete erected in an approved manner on existing foundation. Suitable size &amp; type of foundation bolts 4 nos. X 16mm X 450mm 'J' type (EN8 grade)</p>					
<b>(A)</b>	4 meter Height	18.000			NO	One Number
<b>(B)</b>	5 meter height	10.000			NO	One Number
	<b>PART-12: LIFT AND ACCESSORIES</b>					
<b>141</b>	<p>Supply, installation, testing, commissioning, and final testing of automatic lift complete in the shaft well and pit already constructed as per CPWD specification including automatic rescue device (ARD). All standard equipments, accessories and control equipments as per manufacturer's design and as per CPWD specification (Part III LIFTS) on turnkey basis, Conforming to NBC/statutory norms and fulfilling following requirements.</p> <p>(i) <b>Type:</b> Passenger lift.</p> <p>(ii) <b>Load:</b> As specified elsewhere from 4 passengers (272Kg) to 26 passengers (1768Kg) (for each person standard weight 68Kg.).</p> <p>(iii) <b>Speed:</b> 1.00 metre/sec. or less as required.</p> <p>(iv) <b>Control:</b> ACV3F, 32bit microprocessor integrated serial communication control system with RMS (remote monitoring system)/BMS (building monitoring system) supporting software.</p> <p>(v) <b>Motor/machine:</b> Permanent magnetic synchronous gearless motor.</p> <p>(vi) Operation: Simplex collective selective with/without lift attendant.</p> <p>(vii) Total rise: About 3 mtrs. (approx) two stops only.</p> <p>(viii) Landings: All floors on same side.</p> <p>(ix) Floors served: G+1.</p> <p>(x) Signals: Digital car position indicator, car travel direction indicator inside car &amp; at all landings, voice annunciator with suitable music shall be provided in the lift car.</p> <p>(xi) Shaft size: As per manufacturer's design and as per CPWD specification (Part III LIFTS). Shaft to be constructed separately.</p> <p>(xii) Guide rail: As per manufacturer's specification.</p> <p>(xiii) Lift &amp; car size: As per manufacturer's design and as per CPWD specification (Part III LIFTS).</p> <p>(xiv) Car entrance: As per manufacturer's design and as per CPWD specification (Part III LIFTS).</p> <p>(xv) Landing entrance: As per manufacturer's design and as per CPWD specification (Part III LIFTS).</p> <p>(xvi) Car door: S.S. (stainless steel) hairline finish centre/telescopic opening door with vision panel.</p> <p>(xvii) Landing door: S.S. (stainless steel) hairline finish centre/telescopic opening door with vision panel.</p> <p>(xviii) Door operation: Automatic electric power operated door, full height infrared curtain with multiple criss/cross light beams.</p> <p>(xix) Car interior: S.S. (stainless steel) panel with hair line finish on all sides.</p> <p>(xx) Car floor: Anti skid PVC flooring on heavy duty M S (mild steel) platform.</p> <p>(xxi) Car ceiling &amp; lighting: S. S. (stainless steel) finish with aesthetic appearance with LED ceiling lights</p> <p>(xxii) Car ventilation: Pressure fan/blower fan (car fan with automatic sleep timer shall be provided).</p> <p>(xxiii) Emergency lighting in car: Battery operated emergency lighting in the lift car.</p> <p>(xxiv) Intercom system: Battery operated intercom system in lift car, machine room and ground floor/control room.</p> <p>(xxv) Emergency alarm: Battery operated alarm bell system in lift car &amp; control room / ground floor.</p> <p>(xxvi) Position of machine room: Directly above the hoist-way.</p> <p>(xxvii) Electric power supply: AC 415 V, 3 phases 50 Hz &amp; AC 230 V 1phase 50Hz terminated in machine room.</p> <p>(xxviii) Fire man switch : Fire man switch at machine room/terminal landing</p> <p>(xxix) All car panel buttons and all floor switches must be with Braille language as per lift act.</p> <p>(xxx) Audio visual indication in the lift car showing overloading shall be provided such that doors keep open till excess load is removed.</p> <p>(xxxi) Spring buffer/hydraulic buffer shall be provided</p> <p>(xxxii) Spring buffer/hydraulic buffer shall be provided</p> <p>(xxxiii) Mechanical over speed governor, door key holes in the floor doors shall be provided.</p> <p>(xxxiv) Lift machine hoisting arrangement in the lift machine room and monkey ladder for lift pit should be provided by the lift agency, along with the other steel structure works, foundations for the machines etc.</p> <p>(xxxv) In the hoist way fascia plate shall be provided.</p> <p>(xxxvi) Permanent wiring in lift machine room and lift well with proper no. of light points, with fixtures, exhaust fan, plug points and 3 phase 440V power supply shall be made in lift shaft by the department, machine room or at desired level.</p> <p>(xxxvii) Car top safety barricade shall be provided.</p> <p>(xxxviii) ARD (automatic rescue device): Solid state inbuilt automatic rescue device (ARD) automatically rescues passengers trapped in the lift car in between floors in the event of power failure. Automatic operation and immediate action in the event of mains failure, capable of moving the lift to the nearest landing, opens the automatic door of</p> <p>the lift car and floor. Sealed maintenance free battery backup with automatic charging unit and auto changeover device on mains failure.</p>					
<b>(A)</b>	10 Passenger (680Kg.)	4.000			NO	One number
<b>(B)</b>	Add extra for hall lantern and arrival gong system.					
<b>(I)</b>	Extra cost for per floor per lift	8.000			NO	One Number
<b>(II)</b>	Add extra to item no. 44.1 cost for moon rock finish S.S. (stainless steel) panel.	4.000			NO	One Number
	<b>PART-13: VRF SYSTEM: SUB HEAD IX :-HVAC</b>					

142	Supply Installation, Testing & Commissioning of modular type Variable Refrigerant Flow/Variable Refrigerant Volume air cooled Outdoor units suitable for cooling and heating, having all hermetically sealed inverter type Scroll Compressor(s), minimum two compressors for above 14 HP modules, microprocessor based Controller, top discharge type condensing unit(s), with R 410 A Refrigerant, vibration isolators, with suitable foundation etc. complete as required. The unit shall deliver the rated capacity at AHRI Conditions and work even at 50°C ambient temperature without tripping. The unit shall be suitable to work on 400V +/- 10%, 3 Phase, 50Hz AC power supply. The unit shall be filled with first charge of the refrigerant and ready for use as required. The COP at AHRI conditions shall not be less than 3.1 and IEER not less than 6.5.	724.000			Per HP	One Horsepower	
143	Supply, installation, testing and commissioning of following minimum capacity Round- way flow VRV/VRF Cassette Type Indoor ceiling mounted unit equipped with synthetic washable media pre-filter, fan section with low noise fan/dynamically balanced blower, multispeed motor, coil section with DX Copper coil, electronic expansion valve, outer cabinet, drain pump, grill, necessary supports, vibration isolation, cord less remote control etc., suitable for operation on single phase 230 V ± 10%, 50Hz AC supply, complete, as required. The unit shall have automatic force shut down provision in case of fire on receiving signal from BMS System. The cooling capacity of indoor unit will be at air inlet conditions of 27 Degree C DB and 19 Degree C WB temperature						
(A)	2 TR	5.000			NO	One Number	
(B)	3 TR	10.000			NO	One Number	
(C)	4 TR	132.000			NO	One Number	
(D)	TFA						
(i)	4TR	6.000			NO	One Number	
(ii)	6TR	1.000			NO	One Number	
(iii)	8TR	1.000			NO	One Number	
	<b>PART-14: Central Controller for Indoor &amp; Outdoor Units</b>						
144	Supply, installation, testing & commissioning of Central Controller capable of controlling of all IDUs, ODU's complete with necessary hardware, accessories etc. to perform the following functions: (for IDU Qty upto 80 nos.)  Control of IDUs, ODU's Units as above with monitoring of vital parameters such as temperature sensing & setting, ON/OFF, status etc. Permit / prohibit function of each remote controlled unit Operation of units in individually or in group Fault indication with Alarm						
(A)	The central controller will be complete including all hardware & software (including wiring) suitable to perform above function.	2.000			NO	One Number	
145	Supply, Installation, testing and commissioning including vacuumization and Nitrogen testing of following nominal sizes of soft/hard drawn copper refrigerant piping for VRV/VRF system, complete with fittings, with suitable adjustable ring type hanger supports, jointing/brazing including accessories, insulated with XPLE Class-O tubular insulation/with Class-O closed cell elastomeric nitrile rubber tubular sleeves sections of specified thickness as given below for Suction and Liquid lines, all accessories as per specifications etc. as required :						
(A)	9.5 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm with 19 mm thick insulation	240.000			MTR.	One Meter	
(B)	12.7 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm with 19 mm thick insulation	400.000			MTR.	One Meter	
(C)	15.86 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm with 19 mm thick insulation	440.000			MTR.	One Meter	
(D)	19 mm dia (OD) (Hard drawn) with tube thickness 1.2 mm with 19 mm thick insulation	500.000			MTR.	One Meter	
(E)	22.2 mm dia (OD) (Hard drawn) with tube thickness 1.2 mm with 19 mm thick insulation	200.000			MTR.	One Meter	
(F)	25.4 mm dia (OD) (Hard drawn) with tube thickness 1.2 mm with 19mm thick insulation	140.000			MTR.	One Meter	
(G)	28.58 mm dia (OD) (Hard drawn) with tube thickness 1.2 mm with 19 mm thick insulation	180.000			MTR.	One Meter	
(H)	31.8 mm dia (OD) (Hard drawn) with tube thickness 1.62 mm with 19 mm thick insulation	180.000			MTR.	One Meter	
(I)	34.9 mm dia (OD) (Hard drawn) with tube thickness 1.62 mm with 19 mm thick insulation	125.000			MTR.	One Meter	
(J)	38.1 mm dia (OD) (Hard drawn) with tube thickness 1.62 mm with 19 mm thick insulation	220.000			MTR.	One Meter	
(K)	41.27 mm dia (OD) (Hard drawn) with tube thickness 1.62 mm with 19 mm thick insulation	160.000			MTR.	One Meter	
146	Providing and fixing of CPVC, 6 Kg/ Cm <sup>2</sup> drain water piping with fittings support and insulated with 6 mm thick closed cell elastomeric class O Nitrile Rubber insulation with tubular sleeves complete as per specification and direction of Engineer-in-charge.						
(A)	20 mm dia ID	270.000			MTR.	One Meter	
(B)	25 mm dia ID	360.000			MTR.	One Meter	
(C)	32 mm dia ID	175.000			MTR.	One Meter	
(D)	40 mm dia ID	135.000			MTR.	One Meter	
147	Supplying, Installation, testing and commissioning of Special Refrigerant Y joints for VRF System etc complete as required.	150.000			NO	One Number	
148	Supplying, Installation, testing and commissioning of Additional Refrigerant charging R-410A etc complete as required.	450.000			KG	One Kilogram	
149	Supply, installation, balancing and commissioning of fabricated at site GSS sheet metal rectangular/round ducting complete with neoprene rubber gaskets, elbows, splitter dampers, vanes, hangers, supports etc. as per approved drawings and specifications of following sheet thickness complete as required.						
(A)	24 gauge (Thickness 0.63 mm)	260.000			SQ. MT.	One Sqaure meter	
(B)	22 gauge (Thickness 0.80 mm)	40.000			SQ. MT.	One Sqaure meter	
150	Supplying and fixing of following thickness duly laminated aluminum foil of mat finish closed cell Nitrile rubber (Class "O") insulation on existing duct after applying suitable adhesive for Nitrile rubber. The joints shall be sealed with 50 mm wide and 3 mm thick self adhesive nitrile rubber tape insulation complete as per specifications and as required.						
(A)	19 MM	300.000			SQ. MT.	One Sqaure meter	
151	Supply and fixing of acoustic lining of supply air duct and plenum with 25 mm thick resin bonded glass wool having density of 32 kg/m <sup>3</sup> , with 25 mm X 25 mm GI section of 1.25 mm thick, at 600 mm centre to centre covered with Reinforced Plastic tissue paper and 0.5 mm thick perforated aluminum sheet fixed to inside surface of ducts with cadmium plated nuts, bolts, stick pins, CPRX compound etc. complete as required and as per specifications.	50.000			SQ. MT.	One Sqaure meter	
152	Supplying & fixing of powder coated extruded aluminium <b>Supply Air Grills</b> with aluminium volume control dampers as per specifications	8.000			SQ. MT.	One Sqaure meter	
153	Supplying & fixing of powder coated extruded aluminium <b>Return Air Grills</b> with louvers but without volume control dampers complete as required.	8.000			SQ. MT.	One Sqaure meter	
154	Supplying, laying, testing and commissioning of industrial braided copper conductor, PVC insulated, PVC sheathed, flexible control cable in medium class PVC conduit of suitable size between indoor and outdoor unit etc as required .	2900.000			MTR.	One Meter	
	<b>PART-15: FAÇADE LIGHTNING</b>						
155	Supply, Installation, Testing, and Commissioning (SITC) of LED light source for the fixtures to be supplied shall be designed to operate with a minimum lamp load of up to 24W or better, utilizing LED chips which shall be of Osram or better or CREE or better origin. The input voltage compatibility for the system must be AC220V or better for mono-color configurations and must be 24V or better or 48V or better for RGBW configurations. The beam angle options available for selection shall include but not be limited to 8° or better, 10° or better, 15° or better, 45° or better, 60° or better, 80° or better, as well as elliptical configurations of 1030° or better, 2045° or better, 1565° or better, and 1545° or better, all of which shall be subject to site-specific requirements and shall be selected accordingly. The color output of the LEDs shall be available in RGB, RGBW, or Mono Color, and the color rendering index (Ra) must be a minimum of >82 or better. The output luminous efficacy of the LED fixtures shall be no less than +85lm/W or better to ensure sufficient brightness and energy efficiency. Control systems integrated into the LED fixtures shall be compatible with DMX512 or better, Switch or better, and DALI or better control protocols to provide versatile operation as per the site-specific needs. The housing of the fixture must be made of aluminum or better and the covering material shall consist of tempered glass or better to ensure durability. The external finish shall be treated with anti-ultraviolet poly cool powder or better, meeting outdoor-grade spraying standards, and must include a conventional UV protection layer for a minimum of 10 years or better. The ingress protection (IP)	30.000			NO	One Number	

	rating of the fixtures shall be a minimum of IP66 or better to ensure suitability for outdoor applications. The physical dimensions of the LED The fixture shall be designed to operate effectively within an ambient temperature range of -25°C or better to +60°C or better. The operational life of the LED fixtures shall be a minimum of 50,000 hours or better. The printed circuit board (PCB) utilized in the fixtures must be fabricated from high heat conductivity aluminum or better with a minimum heat conductivity coefficient of ≥2.0W/mK or better to ensure efficient thermal management. All parameters stated shall be considered minimum requirements or better, and the supplier must ensure compliance with all technical specifications outlined herein, without deviation, to meet the tender's exacting standards. Approved Make - Molar / Martin Lightings / Colour Kinetics /Philips/NERI						
156	Supply, Installation, Testing, and Commissioning (SITC) of The RGBW DC24V flexible SPI addressable LED wall washer light shall operate with a Minimum working power of 24W/m or better and must utilize a Minimum voltage of DC24V or better. It shall be controlled by a Minimum SPI IC or better to ensure the display of RGB color chasing LED light effects, delivering enhanced versatility and dynamic illumination. The light must feature a Minimum density of 36 LEDs/m or better, providing a total of Minimum 180 pixels on a 5-meter flexible wall washer light or better, with each 6 LEDs addressable for independent color and brightness control. This 24V dream color SPI neon LED wall washer shall be engineered to experience Minimum voltage drop or better, making it superior to 12V addressable RGB or DC5V LED strip systems by allowing longer operational runs without compromise in performance. It must utilize Minimum RGB 3-in-1 3030 LEDs or better, offering expanded color options and combinations for versatile lighting designs. The system shall be compatible with a Minimum SPI controller or better, enabling it to display a variety of color chasing effects to enhance aesthetic appeal. The LED quantity per meter must be a Minimum of 36 LEDs/m or better, with dimensions measuring a Minimum of 2323mm or better. The light fixture shall meet a Minimum IP65 rating or better for The beam angle shall be configurable with options of Minimum 20°, 30°, 40°, or 1540° or better, ensuring adaptability for various applications. The materials must include Minimum silicone and aluminum or better, ensuring durability and longevity under operational conditions. The color temperature of the LED wall washer light shall be RGB, providing dynamic and vibrant lighting solutions. The control method must be Minimum SPI or better, ensuring precise operation and configuration of lighting effects. The light shall be designed for professional-grade installations requiring reliable, efficient, and flexible lighting solutions. Approved Make - Martin/ Molar/ Color Kinetics /Philips/NERI	150.000			MTR.	One Meter	
157	Supply, Installation, Testing, and Commissioning (SITC) of light source for the specified LED fixtures shall mandatorily be LED and utilize LED chips of Osram or better or Cree or better origin to ensure optimal performance and reliability. The wattage of the fixture shall consist of a configuration of 24*2W or better, delivering efficient illumination under all operating conditions. The input voltage for operation must accommodate both DC24V or better and AC220V or better, with the driver positioned on the back of the fixture. The available beam angles for the fixtures shall include but not be limited to 10° or better, 15° or better, 45° or better, 90° or better, 1030° or better, 2045° or better, 1565° or better, and 1545° or better, with the final selection being site-specific and as per the requirements at the location of deployment. The fixtures shall offer illumination in single color, with a mandatory color rendering index (Ra) of no less than >82 or better to ensure high-quality color reproduction. The delivered lumen output must be a minimum of +80lm/W or better to ensure adequate brightness and efficiency. The control type for the fixtures must be compatible with DMX512 or better, DALI or better, and On/Off switching systems to ensure flexibility and adaptability based on operational requirements. The housing of the LED fixtures shall be constructed from high corrosion resistance die-cast copper-free aluminum or better to withstand harsh environmental conditions. The cover material shall be glass or better, and the coating shall comprise polyester powder coating or better with a phosphoromating pre-finish or better to ensure long-term durability. All screws utilized must be stainless steel or better, and the gasket shall be made of silicone rubber or better to ensure an effective seal against external elements. The ingress protection (IP) rating of the fixture shall be a minimum of IP67 or better,  allowing for reliable performance in outdoor and adverse weather conditions. The fixture must operate effectively within an ambient temperature range of -25°C or better to +60°C or better. The operational life of the LED fixture shall be a minimum of 50,000 hours or better. The PCB used in the fixture must consist of excellent heat conductivity aluminum or better with a minimum coefficient of heat conductivity ≥2.0W/mK or better for superior thermal management. The fixture must include an adjustable bracket or better for installation flexibility. Additionally, the cable gland shall be a double nickel-plated brass cable gland of PG11 or better to ensure robust and secure wiring connections. All stated parameters shall be regarded as the minimum acceptable or better, and compliance with these technical specifications is mandatory to meet the stringent requirements of the tender. No deviation from these specifications shall be permitted. Approved Make - Martin/ Molar/ Color Kinetics /Philips/NERI	50.000			NO	One Number	
158	Supply, Installation, Testing, and Commissioning (SITC) of specified LED fixtures shall mandatorily utilize a source type of LED with a minimum lamp load of 300W or better. The LED chips used shall be of Osram or better or CREE or better origin, ensuring superior performance and reliability. The input voltage shall be compatible with AC220V or better, allowing seamless integration into electrical infrastructure. The beam angle options available for selection must include but not be limited to 8° or better, 10° or better, 15° or better, 45° or better, 60° or better, 80° or better, 1030° or better, 2045° or better, 1565° or better, and 1545° or better, all equipped with a flap cover or better for precision light control, as required on-site. The fixtures shall be capable of delivering RGB, RGBW, or Mono Color outputs with a color rendering index (Ra) of no less than >82 or better. The output luminous efficacy of the fixtures must achieve a minimum of +85lm/W or better, ensuring excellent brightness and energy efficiency. Control compatibility for the fixtures shall include DMX512 or better, Switch or better, and DALI or better, allowing for advanced and adaptable control mechanisms tailored to site-specific requirements. The housing of the fixtures shall be constructed from aluminum or better, with a tempered glass or better cover for enhanced durability and resistance. The exterior finish must feature an anti-ultraviolet poly cool powder coating or better, subjected to outdoor-grade spraying processes, and provide conventional UV protection for a minimum of 10 years or better. The ingress protection (IP) rating of the fixtures shall meet or exceed IP65 or better to ensure suitability for outdoor environments and resistance to dust and water ingress. The fixtures must perform reliably within an ambient temperature range of -25°C or better to +60°C or better. The operational life of the fixtures shall be no less than 50,000 hours or better. The PCB used in the LED fixtures shall consist of high heat conductivity aluminum or better with a minimum heat conductivity coefficient of ≥2.0W/mK or better, ensuring efficient thermal management and enhanced longevity. All parameters stated above represent the minimum requirements or better, and compliance with these specifications is mandatory to meet the tender's requirements. No deviations shall be permitted, ensuring the highest standards for the proposed LED fixtures.. Approved Make - Martin/ Molar/ Color Kinetics /Philips/NERI	4.000			NO	One Number	
159	Supply, Installation, Testing, and Commissioning (SITC) of LED lighting fixtures shall be suitable for operation in dark environments with an effective range of 1–40 meters or better. The LED chip utilized must be of OSRAM or better brand, ensuring superior quality and reliability. The color temperature of the fixtures shall be fixed at 7500K or better, providing a cool white light output suitable for the intended application. The fixtures shall have a minimum color rendering index (Ra) of 80 or better to ensure accurate color representation. The lamp luminous efficiency shall achieve a minimum of 110 lm/W or better, delivering high brightness with optimal energy efficiency. The housing or shell material for the fixtures shall be constructed from aluminum or better for durability and effective heat dissipation. The lens shall be an ultra-clear full coating lens or better to ensure maximum light transmission and minimal distortion. The power supply must incorporate a MEANWELL driver or better, ensuring consistent and reliable performance under varying electrical conditions. The cooling system shall include aluminum cooling fins or better in combination with a CPU-grade waterproof cooling fan or better to maintain optimal operating temperatures and enhance the longevity of the fixture. The wattage of the fixtures shall be 200W or better, ensuring adequate light output for the specified range. The fixtures must comply with a minimum ingress protection (IP) rating of IP65 or better to guarantee resistance to water and dust, making them suitable for outdoor and harsh environmental conditions. The fixtures shall support dual operational modes: rotatable or better for flexible light direction and stationary or better for fixed light placement, providing versatility in application. All technical parameters outlined above shall be considered minimum requirements or better. The fixtures must adhere to these specifications without deviation to meet the rigorous standards of the tender. Approved Make - Martin/ Molar/ Color Kinetics /Philips/NERI	2.000			NO	One Number	

160	Supply, Installation, Testing, and Commissioning (SITC) of The power supply unit shall be a high efficiency, single-output enclosed type, designed with a Minimum 30mm low-profile architecture or better, offering a Maximum power output of 350W or better. It must feature a selectable AC input range of Minimum 115VAC or 230VAC via switch or better and shall be capable of withstanding a Minimum 30VAC surge input for a duration of Minimum 5 seconds or better. The unit must deliver output voltage options of Minimum 3.3V, 4.2V, 5V, 12V, 15V, 24V, 36V, and 48V or better, ensuring compatibility with a broad range of applications. It must include comprehensive protection mechanisms such as Minimum short circuit, overload, overvoltage, and overtemperature protections or better, ensuring safety and durability. Cooling shall be achieved through a built-in DC fan, with forced air cooling functionality and a Minimum built-in fan ON-OFF control system or better. The design must conform to a Minimum 1U low-profile standard or better, facilitating integration into space-constrained environments. The unit must be able to withstand a Minimum 5G vibration test or better and operate at an altitude of up to a Minimum of 5000 meters or better. It must include a Minimum LED indicator for power-on status or better and exhibit no-load power consumption of less than Maximum 0.75W, ensuring compliance with global energy efficiency standards. Operating temperatures must range from Minimum -25°C to Maximum +70°C or better, providing reliable performance under extreme environmental conditions. The power supply must undergo a Minimum 100% full-load burn-in test or better to ensure reliability. Efficiency levels shall reach a Minimum of 89% or better.	40.000			NO	One Number	
161	Supply, Installation, Testing, and Commissioning (SITC) of The Ethernet Control System shall be designed to operate on the Artnet protocol and must be capable of converting Minimum Artnet network data packets into DMX512 data or better. It shall incorporate a Minimum power input range of 5-24V DC or better and must accommodate an input signal of Minimum Artnet or better, with an output signal of Minimum DMX512 or better, ensuring superior compatibility and efficiency in professional lighting control applications. The system must feature a Minimum DMX channel configuration of 8 universes or better, allowing for broad and scalable usage in stage and entertainment lighting scenarios. The chassis shall be of a Minimum standard 1U (19") architecture or better, facilitating convenient integration into standard cabinet systems. It must include an interface designed with a Minimum LCD display and Minimum 4 buttons or better, enabling intuitive operation and efficient configuration. The system must provide connectivity through a Minimum RJ45 Ethernet port and Minimum 3-pin XLR DMX512 output connectors or better, delivering seamless and stable performance across networks. The current input shall be a Minimum of 30mA@12V DC or better, while the DMX output configuration must provide a Minimum of 8 DMX512 data output ports or better, supporting the connection of a Minimum of 256 DMX universes to one network or better. Ethernet compatibility shall include a Minimum 10/100Mb port or better, with functionality enhanced through data activity indicators and configurable DMX output refresh rates. The system must allow for Artnet management on a Minimum broadcast mode or unicast mode or better, ensuring versatile adaptability. Furthermore, the system shall adopt a Minimum high-speed ARM processor or better, guaranteeing stability and reliability for demanding lighting applications. It must be fully compatible with lighting software based on the Minimum Artnet protocol or better, ensuring seamless integration with professional lighting control systems. Approved Make -> Master Model Color Kinetics	4.000			NO	One Number	
162	Supply, Installation, Testing, and Commissioning (SITC) of The Ethernet Control System shall be designed and engineered to operate fundamentally on the Minimum Artnet protocol or better and must be equipped to seamlessly convert the Minimum Artnet network data packets into Minimum DMX512 data or better. The system should incorporate advanced functionality to ensure the segmentation of different network subsets, which shall be essential to preclude interference arising from multiple sets of Minimum Artnet data transmissions. The architecture must adopt a Minimum high-speed ARM processor or better, ensuring operational stability, reliability, and efficiency under demanding conditions. The connectivity infrastructure should be comprised of a Minimum RJ45 Ethernet network interface or better and a Minimum 3-pin XLR DMX512 output interface or better, providing robust and stable communication channels. The control interface must feature a Minimum LCD screen display or better complemented by a Minimum of 4 buttons or better, enabling convenient system operation and intuitive parameter configuration. The chassis shall be constructed in a Minimum 1U (19") standard architecture or better, ensuring compatibility with conventional cabinet installations while maintaining structural convenience. The system should furnish a Minimum of 8 standard DMX512 data output ports or better, facilitating comprehensive control across a variety of lighting equipment. The system must support compatibility with professional lighting software that is based on the Minimum Artnet protocol or better, enabling precise and dependable stage lighting control applications. Additionally, it must be capable of connecting a Minimum of 256 DMX universes to a single network or better, ensuring scalability for expansive lighting setups. Ethernet compatibility shall incorporate a Minimum 10/100Mb Ethernet port or better, and the system must provide features such as a Minimum 3-pin XLR DMX512 output interface or better, ensuring reliable data transmission. The system must allow management of Minimum Artnet data in both broadcast mode and unicast mode or better, ensuring adaptable deployment across varied network environments. The system's power input shall be capable of accepting a Minimum range of 5-24V DC or better, while the current input must accommodate a Minimum of 30mA@12V DC or better. Input signals shall be aligned to the Minimum Artnet protocol or better, with output signals adhering to the Minimum DMX512 standard or better. The DMX channel configuration shall provide control over a Minimum of 8 universes or better. The DMX output connections should be established using Minimum 3-pin XLR connectors or better, while the network connections shall employ a Minimum RJ45 interface or better, guaranteeing high reliability and performance. This system shall embody state-of-the-art technology and robust construction, delivering a sophisticated solution for professional-grade lighting control systems while ensuring that all operational parameters meet or exceed the prescribed Minimum specifications or better. Approved Make -> Master Model Color Kinetics	1.000			NO	One Number	
163	Supply, Installation, Testing, and Commissioning (SITC) of Fasad Lighting Controlling Server With Lifetime Lisance The system shall demonstrate a Minimum exceptional and unparalleled versatility or better, permitting direct interoperability with a Minimum comprehensive range of LED configurations and technologies or better. It must maintain Minimum compatibility with both proprietary and third-party LED controllers or better to ensure uninterrupted functionality across interconnected systems. A Minimum DMX-based output or better is essential, encompassing but not confined to Minimum Art-Net (including all iterations: I, II, 3, 4) operable in both unicast and broadcast formats or better, DMX512, and Minimum Color Kinetics or better. It must further support Minimum KINET protocols (Minimum V1, V2, V3 or better) and facilitate Minimum Philips Hue integration or better. SPI compatibility must be enabled via a Minimum Nebula or equivalent or better, ensuring support for Minimum Streaming ACN (sACN/E1.31) in unicast and multicast configurations or better. The system shall also feature Minimum DMX-based output compatibility or better, incorporating Minimum ColourSmart Link, Colorlight A8, Colorlight SA, Colorlight T9, and DVI standards (including Minimum VGA, HDMI, and other advanced formats or better). It must integrate seamlessly with a Minimum range of lighting desks, consoles, and associated hardware/software or better. Minimum adherence to advanced industry protocols or better is non-negotiable, encompassing Minimum Art-Net (I, II, 3, 4), ASIO, Blackmagic Design compatibility. The system shall incorporate a Minimum Intel Core i7-12700 processor or better, operating with a Minimum 20-thread capacity or better. Processor speeds shall achieve Minimum base clock rates of 2.1GHz for P-cores and 1.6GHz for E-cores or better, reaching a Maximum Turbo Boost of Minimum 4.9GHz overall or better, 4.8GHz for P-cores or better, and 3.6GHz for E-cores or better. Additionally, the system must possess a Minimum 16GB of UDIMM DDR5-4400 RAM or better with Non-ECC configuration or better, ensuring Minimum high-speed and stable operation for multitasking or better, enabling seamless performance across demanding computational applications. Minimum DeckLink, Intensity, and equivalent Further functionalities must include Minimum MIDI, NewTek NDI (send and receive capabilities) or better, HTTP-based remote control systems, Spout for data transfer (Minimum send and receive or better), and Minimum Streaming ACN (sACN/E1.31) or better. Time synchronization using Minimum Art-Net, MIDI, SMPTE, and system time or better is indispensable. The system's LED mapping functionality shall enable a Minimum infinite variety of creative possibilities or better. It must allow Minimum installations in any form or layout or better, delivering pixel-perfect accuracy at Minimum lower resolutions or better for crisp and sharp results. Advanced 3D LED matrix support with Minimum voxel mapping capabilities or better is a requirement, allowing installations that combine Minimum 2D elements with 3D constructs or better to deliver groundbreaking visual results. All workflow features must be Minimum user-friendly, intuitive, and creative or better, empowering users to execute projects with Minimum efficiency and ease or better. With a Minimum leading-edge feature set or better, the system must establish itself as a robust platform capable of achieving Minimum visual and technical excellence or better in LED displays. better), CAST Software BlackTrax via scripting or better, and other standards including Minimum CTP, DMX512, GamePort, MA-Net 1, and MA-Net 2 or better. Integration with Minimum MADRIX I/O and ORION systems or better, along with support for a Minimum comprehensive media range (e.g., logos, videos, live captures, etc.) or better, is required. End.	1.000			NO	One Number	
164	Supply, Installation, Testing, and Commissioning (SITC) of DMX Cable 5 Core Shilded Armourd For Outdoor application	1000.000			NO	One Number	
165	Supply, Installation, Testing, and Commissioning (SITC) of IP65 Connectors , DMX , Plug Filment hardware lnteconnetc and all required accessories as on Required on Site	1.000			NO	One Number	
166	Facade Lighting Programming Charges	1.000			JOB	One Job	

PART-16: ELV SYSTEM (AUDIO VISUAL)						
167	<p>Supply, Installation, Testing, and Commissioning (SITC) of Active LED with Controller (Size 16.8 ft x 9.5 ft) shall adhere to the following specifications and requirements to ensure optimal performance and compliance with international standards. The display technology should be Micro LED (Indoor) SMD or better, with modules having a dimension of not less than 320mm x 160mm x 15mm or better to facilitate modular design and scalable configurations. The overall video wall dimensions must achieve a minimum width and height through a combination of cabinets as specified, ensuring compatibility with the modular units detailed herein. The total resolution of the display must not be less than the stated minimum resolution in pixels, providing exceptional clarity and image fidelity. Each pixel pitch must be less than 2.5mm to guarantee high-definition output, with a pixel density no less than 160000 pixels per square meter or better. The processing capability shall be 13 Bit or higher to support sophisticated visual rendering. The individual pixel per tile should comprise a minimum configuration of 128x64 pixels (HxV). Horizontal and vertical viewing angles shall be no less than 150 degrees and 130 degrees, respectively, for wide viewing coverage. The refresh rate should be a minimum of 3840Hz or higher to ensure a flicker-free display experience, with an adjustable color temperature ranging between 3000 and 15000. The video frame rate must achieve a minimum of 30Hz or better to maintain smooth playback of dynamic content. Reliability metrics shall demonstrate an average time without failures of no less than 5000 hours, complemented by an LED lifetime of 30000 hours or better. The system must support HDR compatibility, including HDR10, HDR10+, and HDR10 Pro standards, and operate continuously 24x7x365. The operational temperature range must span from -20 to +40 degrees Celsius, with humidity tolerances between 10% and 60% RH. The on-screen brightness should be a minimum of 450 cd/m² or better to ensure visibility in various lighting conditions. The system's ingress protection shall be rated at a minimum of IP30 or better. Maintenance procedures should ensure ease of access and a damage-free process for handling tiles or LEDs. Continued.....</p> <p>the video wall must possess and provide evidence of all necessary certifications, including but not limited to BIS, CE, FCC, and RoHS, to confirm compliance with safety and international standards. A provision of 10% spare LED modules, along with cards, should be supplied and stored on-site. Each cabinet, not less than 640x480mm in size or better, must support six modules and include all necessary components such as receiving cards and power supplies for each module. The system must offer pixel-level brightness and chroma calibration, with capabilities for quick adjustments of dark or bright lines. Interfaces should include at least one SL DVI connector, one HDMI 1.3 connector, one audio connector, four gigabit Ethernet outputs, one light sensor connector, and one type-B USB control port. Additionally, there must be two UART control ports, enabling device cascading with a capacity of up to 20 devices. The electrical input voltage must range from AC 100-240V~50/60Hz, with rated power consumption not exceeding 6.6W or better. The LED display controller shall support a minimum of one DVI input, one HDMI input, one audio input, and four Ethernet outputs, accommodating input resolutions up to 1920x1200@60Hz., individual gamma adjustments for RGB, image rotation in 90° increments, mapping functionality, and the ability to pre-store and set images in the receiving card. The specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official</p>	2.000			NO	One Number
168	<p>Supply, Installation, Testing, and Commissioning (SITC) of display with a diagonal size of 110 inches or larger, featuring a resolution of 3840 x 2160 (4K or higher) and a color capability of 1.07 billion colors or greater. The display must achieve a minimum brightness of 350 cd/m², with a maximum brightness of 400 cd/m². It shall provide a viewing angle of ±178° or better. The contrast ratio must be at least 1200:1, with a dynamic contrast ratio of 30,000:1. The response time of the display shall not exceed 8 ms, and the display's operational lifetime shall be 50,000 hours or more. The audio system integrated into the touch interactive display should consist of speakers rated at 2 x 14 watts or higher, ensuring quality sound output. The touch technology deployed should utilize advanced infrared technology, complemented by 4mm toughened glass that boasts 9H toughness or better. The surface technology of the display must be anti-glare, with touch accuracy specified at 1 mm or better. Furthermore, the display should support a minimum of 20 touch points in the Windows operating system. The front interface must include two USB-A 2.0 ports and three USB-A 3.0 ports. Additionally, the interface should provide keys for power, homepage, screen down, record, touch lock, and settings. The rear interface must comprise two HDMI inputs, one HDMI output, one USB-B port, one VGA with audio input, one USB-A 2.0 port, one USB-A 3.0 port, one RJ45 input, one TF card slot, one RS232 port, one COAX port, and one line output. The smart system should be based on Android, featuring an 8-core A55 CPU and a quad-core Mali G52 GPU. It must run Android version 12.0 or higher, with access to the Play Store. Built-in software should include a file manager, screen mirroring capabilities, and various productivity applications, including text recognition and wireless content sharing. The whiteboard feature should come equipped with a new menu bar that includes options for storage, sharing, and various drawing functions. Additionally, the device must support dual Wi-Fi (6G &amp; 2.4G) and Bluetooth 5.0 or better. The system should be equipped with at least 8 GB of RAM and 128 GB of ROM. The display must hold certifications from BIS (Indian), CE, FCC, and RoHS. Compliance with ISO standards 9001, 45001, 27001, and 14001 is mandatory. The specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation</p>	3.000			NO	One Number
169	<p>Supply, Installation, Testing, and Commissioning (SITC) of an interactive panel display, which must be an 86-inch model featuring a minimum visual ratio of 16:9 and a minimum visual area measuring 1209.6mm (H) x 680.4mm (V). The resolution shall be a minimum of 3840 pixels (H) x 2160 pixels (V), with a pixel pitch of 0.315mm x 0.315mm or better. The panel must be equipped with a frequency of not less than 60Hz, supporting a color depth of 1.07 billion (10-bit) and a color gamut of a minimum of 72% (Typ). The contrast ratio shall be a minimum of 1200:1 (Typ) and must include a dynamic contrast ratio of 30,000:1 or better. The display shall be capable of achieving a viewing angle of 178° both horizontally and vertically, with the backlight source being Direct LED (DLED) and a minimum brightness of 350 cd/m², while the maximum brightness shall be 500 cd/m² or better. The operational lifespan must not be less than 50,000 hours. The integrated speaker system shall have an output of 2 x 20W or better. Touch functionality must be based on infrared identification, supporting at least 20 touch points, with a minimum identifier of 2mm. Input for touch and writing shall support opaque objects such as fingers and pens. The response time must not exceed 5ms, and the touch accuracy shall be ±1mm or better, with a writing height of no more than 3mm. Output coordinates shall have a resolution of 32767 (W) x 32767 (D), with the screen surface achieving a minimum hardness of 9 Mohs. The system version shall be based on Android 12.0 with a minimum working frequency of 1.2GHz, driven by an 8-core A55 CPU and a quad-core Mali G52 GPU or better. Memory specifications must include a minimum of 4GB RAM and 32GB ROM, and Bluetooth version shall be at least 5.0. Wireless communication shall support both 2.4GHz and 5GHz operation</p> <p>Front interface must feature a minimum of two USB 3.0 ports. Physical buttons shall include power, homepage, screen down, record, touch lock, and settings. Onboard interface shall provide 1 x TF Card slot supporting 64GB, 128GB, 256GB, and up to 1TB, along with a minimum of 1 x USB 3.0, 1 x USB 2.0, 1 x TOUCH Out, 2 x HDMI In, 1 x VGA, 1 x AUDIO In, 1 x RS232, 1 x RJ45 In, and 1 x earphone jack. Optional interfaces shall include a minimum of 1 x HDMI Out, 1 x DP In, 1 x RJ45 Out, and 1 x Mic In. The device shall be certified with BIS (Indian), CE, FCC, and RoHS certifications and must meet OEM standards for ISO 9001, ISO 45001, ISO 27001, and ISO 14001. The specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant</p>	12.000			NO	One Number

170	<p>Supply, Installation, Testing, and Commissioning (SITC) of display system should be designed with a size of 75 inches, adhering to a visual ratio of 16:9. The maximum visual area must be no less than 1651 (H) × 929 (V) mm, with a resolution that supports 3840 (H) × 2160 (V) pixels. The pixel pitch must be no greater than 0.42975 × 0.42975 mm. The frequency shall be 60Hz, ensuring that the display supports up to 1.07 billion colors (10-bit) with a minimum color gamut of 72%. The contrast ratio should be no less than 1200:1 (typical), with a dynamic contrast ratio of at least 30,000:1. The viewing angle must extend to at least 178° both horizontally and vertically. The backlight source should be DLED, providing a brightness up to a minimum of 450 nits. The life span of the display shall be no less than 50,000 hours. The speaker system must support a 2.0 soundtrack with power output of no less than 2 × 20W. The touch specifications should include infrared identification touch mode with a minimum of 20 touch points. The minimum identifier should be no less than 2mm, and the input mode should support opaque objects such as fingers and pens. The response time shall not exceed 5ms, with touch accuracy of ±1mm and a writing height of ≤3mm. The output coordinates shall be 32767 (W) × 32767 (D). The surface hardness must be at least 9 Mohs. This configuration must meet or exceed the minimum design requirements. Any deviations from these specifications, including use of substandard components or performance, will lead to disqualification without prior notice. All components and systems must conform to the specified standards, ensuring robust functionality and reliability in professional environments. The system should run on Android 12.0 with a minimum frequency of 1.2GHz and 1.5GHz. The CPU should be octa-core A55, paired with a quad-core MaliG52 GPU. The system must be configured with at least 4GB/8GB of RAM and 32GB/64GB of ROM. The OSD should support English and all major Indian languages. The Bluetooth version should be 5.2, with an operating frequency of 2.4GHz and an operating distance of 0-10m. The system should include built-in Bluetooth. Continued.....</p> <p>Wi-Fi support should comply with IEEE 802.11 a/b/g/n/ac/ax, operating on 2.4GHz and 5GHz frequencies, with a range of 0-10m. Wi-Fi should be built-in, supporting the relevant mode. The power parameters should be as follows: the voltage range must support 100-240V~ 50/60Hz 4A. The maximum power consumption should be no greater than 290W, with standby power consumption of ≤0.5W. Front interface connections should include at least two USB 3.0 ports, with keys for power, homepage, screen down, record, touch lock, and settings. The onboard interface should feature one TF card slot supporting up to 1TB, one USB 3.0 port, one USB 2.0 port, one touch out, two HDMI inputs, one VGA input, one audio input, one RS232, one RJ45 input, one earphone jack, and one coaxial input. Optional interfaces should include one HDMI output, one DP input, one RJ45 output, one mic input, and OPS compatibility. The OPS module should include a CPU compatible with Intel® Core i5/i7 (8th/10th/12th Gen, Octa-Core), with a minimum memory of 8GB/16GB DDR4 and storage options of 256GB SSD or 512GB SSD/HDD 1TB (optional). The module should provide at least 6 × USB3.0 Type-A ports, one USB Type-C port, one RJ45 10/100/1000M, one HDMI 1.4 output supporting a maximum of 4K/30Hz, one DP output, one 3.5mm line-out, one 3.5mm mic-in, two Wi-Fi antennas, and a power button. The specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for</p>	4.000			NO	One Number	
171	<p>Supply, Installation, Testing, and Commissioning (SITC) of Retractable Screen For Chairman -- The height-adjustable display shall feature a 15.6-inch IPS full-view screen with a 16:9 aspect ratio and a resolution of 1080p. It must be designed with a dustproof and fingerprint-proof 10-point capacitive touch screen, demonstrating a sensitivity of less than or equal to 2 ounces and a touch response time of three milliseconds or less. The display shall integrate the touchscreen and display screen, characterized by a curved edge design and an ultra-narrow black border of five millimetres or less, ensuring excellent color reproduction without issues of greying or detachment. The display screen shall be equipped with a lift mechanism, utilizing an ultra-narrow, ultra-thin, finely sandblasted anodized panel. The panel thickness shall be limited to three millimetres, with a width of just 70 millimetres, minimizing desktop space while maintaining aesthetic appeal. The device shall operate on a low-voltage 12VDC circuit, eliminating the need for internal 220VAC power and thereby reducing the risk of leakage, ensuring both safety and reliability. Control of five mechanical actions—raise, lower, stop, forward, and backward—shall be facilitated by panel buttons. Upon raising, the display shall automatically tilt upwards by 15 degrees. The intelligent lift mechanism must include an automatic power-on feature when raising, and an energy-saving auto power-off function when lowering, ensuring safety. The integrated panel shall contain a power switch and a retractable metal USB interface for secure connectivity, avoiding detachment of the dust cover. It must allow file reading from USB drives, local browsing, or server uploads. An anti-obstacle and anti-pinch function shall be implemented; if obstacles interfere with the device's operation, it must cease movement within a predefined time to prevent damage. The lift display shall support simultaneous HDMI and VGA signal inputs, with the ability to auto-recognize a single signal while allowing for manual switching between dual signals. It shall enter power saving mode when no signal is detected for a predefined time. The system shall feature a separate lift mechanism for the microphone, complete with independent buttons for raising and lowering. A built-in conference speaking unit shall be included, with a chairman unit that offers priority and speech buttons. Standard CAT5e cabling shall be used for connections, incorporating RJ45 connectors that support independent microphone sensitivity adjustments and an 8-stage equalizer (EQ). The display shall have two 3.5mm speaker output ports, one RJ11 voting function module expansion port, and two RJ45 cascade interfaces to facilitate expansion for embedded conference voting, interpretation, and speaker amplification modules. High-fidelity audio quality must be achieved through lossless audio transmission technology, with a sampling frequency of 48KHz and a response frequency range from 20Hz to 20KHz. A built-in microphone unit shall provide hot-plug and auto-recovery functionality. The system must support a voice control mode that intelligently opens the microphone and sets a closing time, with adjustable voice sensitivity and a customizable automatic shutdown feature for inactive microphones, allowing a maximum of 140 seconds before shutdown. Configuration settings must be accessible via the conference host's front panel menu or PC software. The display's specifications shall include a resolution of 1920 × 1080P and a contrast ratio of 600:1, with a brightness of 300 CD/m². The backlight shall utilize anodized brushed craftsmanship. Panel functions shall include a USB interface, options for raising (screen tilted forward), stopping, lowering (screen restoring to vertical), signal switching, and powering the device on/off. Control of the lift shall be accomplished through RF remote control (effective within 30 m), manual control, or RS232/485 protocols. The chassis must feature multiple interfaces, including two DC12V power input/output ports, one USB-B touch input, one USB-APC power switch, one HDMI input, one VGA input, and two RJ45 control interfaces supporting RS-485/RS232 protocols. The specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation. End .....</p>	6.000			NO	One Number	
172	<p>Supply, Installation, Testing, and Commissioning (SITC) of The device shall mandatorily integrate a minimum 1/2.8 Sony® CMOS Image Sensor or superior for facilitating precision image acquisition and should enable an optical zoom capacity no less than a minimum of 20x or better, with a focal length spanning from F=5.2 mm to 94 mm or better. The horizontal field of view should possess a minimum coverage of 56.45° or better, supported by a shutter speed adjustable within a minimum range of 1/50 sec to 1/10,000 sec or better. The iris mechanism shall operate within a range of F1.5 to F3.0 or better, and the minimum illumination sensitivity threshold should be established at 2 lux or better for optimized low-light operability. Pan and tilt functionalities shall be enabled, allowing a minimum pan range of -130° to 130° and a tilt range of -30° to 90°, with a minimum movement speed of 0.2°/s — 90°/s and 0.2°/s — 70°/s, respectively. A minimum provision of 256 configurable presets shall be incorporated, alongside white balance configurations encompassing Auto, Indoor, One Push, and Manual modes. Exposure control mechanisms shall incorporate Auto, Manual, Shutter Priority, Iris Priority, and Brightness Priority. Video output capabilities must include, at a minimum, 3G-SDI, HDMI®, USB, NDI®/HX, ONVIF, RTSP, and UVC outputs, with support for signal formats including SDI/HDMI at 1080p60/50, 720p60/50/50, and USB at 1080p30/25. Communication interfaces should be comprised of USB-B 3.0, RJ-45 Ethernet at 100 Mbps, and serial communication through RS-232 and RS-485. Control protocols shall mandatorily feature VISCA/TCIP, VISCA/UDP, PELCO-D, PELCO-P, and ONVIF compatibility. Connectivity features shall incorporate minimum support for PoE via IEEE 802.3af Class 3, 3G-SDI OUT, HDMI OUT, USB-B 3.0, and a 12VDC power input. Status indicators shall include a multisegment tricolor LED, with live feed, firmware upgrades, and privacy modes distinctly represented. The device must conform to regulatory mandates including FCC Part 15 Class B, IC Class B, CE, and Intertek® certifications for US and Canada. The specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for</p>	8.000			NO	One Number	

173	Supply, Installation, Testing, and Commissioning (SITC) of Ceiling Microphone system shall be equipped with a minimum of 1 x 3-pin terminal (compatible with Phoenix Contact MCVW 1.5-3-ST-3.81) and 2 x Digital Dante Network Audio connectors, utilizing RJ-45 connectors for both primary and secondary connections. The Ethernet/control interface must include 1 x RJ-45 Ethernet port, which shall be responsible for PoE power supply and data/control communication. The required supply voltage should be 44 – 57 V DC minimum, and the device must be capable of supporting PoE IEEE 802.3af Class 3 or better. The maximum power consumption of the system shall not exceed 8.8 W, with the safety certification being UL 62368, inclusive of UL 2043 testing and compliance. The ambient operating temperature range should be from 0°C to 40°C (32°F to 104°F), with the storage temperature capable of withstanding from -10°C to 60°C (14°F to 140°F) minimum. Relative air humidity must be maintained between 20% to 95%, non-condensing. The acoustic properties shall include a pre-polarized condenser microphone transducer principle, with a minimum AF frequency response from 160 Hz to 18,000 Hz. The system must exhibit a sensitivity of 0 dBV/Pa (989 mV/Pa) and achieve a minimum signal-to-noise ratio of 83 dB (A), with latency not exceeding 4 ms and equivalent noise level not exceeding 11 dB (A) minimum. The system must be equipped with 28 KE 10-237 microphone capsules, each providing a beam pattern with a maximum sound pressure level of 104 dB SPL. Additional features shall include Tru VoiceLift, a priority zone, and the ability to manage exclusion zones. The system must support camera control via talker position data, with IEEE 802.1x compliance and coverage capable of extending up to a minimum of 80 m². Furthermore, the system shall be certified for use with leading platforms such as Microsoft Teams, Zoom, DingTalk, and Tencent, ensuring full interoperability and optimized performance. The specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation.	2.000			NO	One Number
174	Supply, Installation, Testing, and Commissioning (SITC) of Integrated audio solution shall be designed to ensure an extremely high level of performance with a range of technical specifications that meet or exceed industry standards for professional audio applications. The system shall maintain a minimum Total Harmonic Distortion plus Noise (THD+N) of 0.002% (measured at 1kHz @ +4dBu, 22Hz to 22kHz frequency range), ensuring that the audio output maintains the highest fidelity with minimal distortion. The Equivalent Input Noise (EIN) of the system must be no greater than <125dBu, unweighted, across the full frequency spectrum from 20Hz to 20kHz. This ensures a quiet signal path with minimal interference or noise, critical for high-quality audio reproduction in sensitive environments. The system's Dynamic Range shall be no less than 110dB, unweighted, ensuring that the system can accommodate both very low-level signals and transient peaks without distortion, delivering exceptional clarity and detail across all audio sources. The Propagation Delay shall be maintained at a maximum of 4ms, guaranteeing that the audio signal is processed and transmitted with minimal latency, which is crucial for real-time communication and seamless audio performance. Crosstalk, which refers to unwanted signal interference between inputs, shall be no higher than <110dB at 1kHz, ensuring that each channel remains independent and free from cross-channel contamination, delivering a clean and precise audio output. The system shall operate at a minimum Sampling Rate of 48kHz, providing high-quality digital audio conversion, ensuring the preservation of audio detail and accuracy, making it suitable for professional environments. AD-D/A Converters shall be no less than 32-bit, ensuring the conversion between analog and digital signals is performed with the highest possible bit-depth, contributing to the overall quality and precision of the system's audio performance. Acoustic Echo Cancellation shall require the HearClear™ license, which must be included in the system, to ensure effective echo management. The system must exhibit a maximum latency of 250ms when reduced to no more than 100ms when operating at 16 channels. The power requirements for the system must be compatible with the BTU/Heat Load of a minimum of 44 BTU/hr, ensuring that the system operates efficiently without excessive heat generation, and that it is safe for use in a variety of environments. The system shall be powered by a 40-bit floating point processor, which shall be capable of handling complex audio processing tasks with high efficiency and accuracy, ensuring optimal performance under demanding conditions. Phantom Power must be provided at +48VDC and shall be capable of delivering up to 75mA maximum, ensuring the power needs of condenser microphones and other sensitive audio equipment are met. The power supply must adhere to IEEE 802.3af, Class 0 Power-over-Ethernet (PoE) standards, ensuring that the system is compatible with PoE infrastructure and minimizing the need for separate power adapters. Power consumption shall be no more than 13W under maximum load, ensuring that the system is energy-efficient and can operate in a wide variety of settings without putting undue strain on electrical systems. The system must be able to function in ambient operating temperatures ranging from a minimum of 32°F (0°C) to a maximum of 104°F (40°C), ensuring reliable operation in a broad range of environmental conditions. The system shall be capable of operating in humidity conditions ranging from a minimum of 0% to a maximum of 98%, non-condensing, ensuring robust operation in challenging environments, such as those with high levels of moisture or temperature fluctuation. Altitude operation must be supported from sea level up to a minimum of 6,600 feet (2,000 meters) above mean sea level, ensuring the system operates reliably in high-altitude environments. The network connection options shall include at least two RJ45 connectors, which must be compatible with a minimum of Cat 5e cables, providing one dedicated 1000Mbps Dante™ connection and a separate Ethernet port for control and Power-over-Ethernet functionality. This ensures flexibility and high-performance networking in a variety of installation scenarios. The USB connection, when using the XC-SUB, must feature a 16-bit bit depth and support a minimum of 2x2 channels for both sending and receiving, ensuring high-quality data transfer for connected devices. The driver sample rate shall be a minimum of 48kHz, and the card sample rate must follow the DSP settings for accurate synchronization with the overall system. Dante™ compatibility shall support a minimum of 4x4 bi-directional channels, with AES67 Card Slots for up to eight (8) user-configurable options, ensuring scalability and flexibility for large installations requiring complex audio routing and distribution. The system shall feature indicators for audio in, audio out, network connectivity, and operational status, allowing for quick visual assessment of system performance. A recessed IP reset button shall be included for emergency recovery, alongside a factory service micro-USB port for technical maintenance and upgrades. Additionally, the system shall include Mix and Match functionality, ensuring that users can configure and operate the system in diverse and flexible configurations, depending on the specific requirements of the application. The specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation.	1.000			NO	One Number
175	Supply, Installation, Testing, and Commissioning (SITC) of codec system to be provided shall include video features that ensure minimum native 16:9 widescreen support and advanced screen layouts or better. It shall support video resolutions of minimum 4K at 30fps, 1080p at 60fps or 30fps, 720p at 60fps or 30fps, and 4CIF at 30fps, as well as CIF and QCIF or better. The system must be fully compatible with H.323, SIP, and WebRTC protocols for unified communication platforms. Bandwidth capabilities shall range from minimum 64kbps to 8Mbps or better, with video standards and protocols supported including minimum H.263, H.263+, H.263+, H.264, H.264 SVC, H.264 High Profile, VP8, VP9, and H.265 or better. The audio standards and protocols supported by the system shall include minimum G.711, G.722, G.722.1C, AAC-LD, G.726, and SILK or better. The codec must have minimum 2 HDMI inputs supporting 4K at 30fps and minimum 1 USB 3.0 video input or better. For video output, the system shall include minimum 1 HDMI output supporting HDMI 2.1 with a maximum resolution of 4K at 60Hz and minimum 1 HDMI output supporting HDMI 1.4 with a maximum resolution of 1080p at 60Hz or better. Audio input configurations shall include minimum 1 x 3.5mm input, 1 x RCA input, 1 x USB 2.0, 1 x HDMI embedded audio input, and 1 x DMIC or better. Audio output shall consist of minimum 1 x 3.5mm output, 1 x RCA output, 1 x USB 2.0, and 1 x HDMI embedded audio output or better. Additional interfaces must include minimum 1 Ethernet port (RJ-45) 10/100/1000 for internet connectivity and minimum 1 RS232 port or better. Wireless connectivity shall be supported with minimum 1 x WiFi (802.11a/b/g/n/ac) or better, and content sharing shall be enabled via minimum 1 HDMI for wired content sharing and through wireless dongle compatibility. The system's IP network features must include minimum support for TCP/IP, DHCP, SSH, HTTP, HTTPS with SSL/TLS, RTP, RTCP, RFC3261, RFC3264, RFC2190, RFC3407, RFC2833, RFC4585 (RTP/AVPF), SNTP, and ARP or better configurable encryption on/off functionality, and automatic key generation and exchange or better. Continued .....	2.000			NO	One Number



	<p>. Video encoding and decoding shall support minimum a video stream of 4K at 30fps, a content stream of 4K at 30fps, and 1080p at 30fps or better. Security features must include minimum AES-128/256 encryption for signalling and media streams, TLS &amp; SRTP, an administrator password, SSH/HTTPS, The codec system shall comply with minimum ITU-T H.239, BFCP standards and support both IPv4 and IPv6 protocols. must include auto/manual gatekeeper discovery, IP precedence, H.323-based packet loss recovery, and URL dialling capabilities as a minimum standard. Protocol support must include minimum H.460, ICE, H.221, H.224, H.225, H.235, H.241, H.245, H.281, H.350, H.460, T.140, DTMF, and LDAP or better. The system shall provide provisions for software-based VC apps and support professional applications such as Cisco Webex, Zoom, Google Meet, and Microsoft Teams. Power supply requirements shall range from AC 100V ~ 240V, with a maximum power consumption of 50 Watts. The system must operate effectively within a working temperature range of minimum -10°C to 40°C or better and a storage temperature range of minimum -40°C to 70°C or better. Certification must include minimum BIS (Indian), CE, FCC, and RoHS or better, and the OEM must possess certifications for ISO 9001, 45001, 50001, 27001, and 14001 or better. The specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without any approval material is not considered for installation. End</p>					
176	<p>Supply, Installation, Testing, and Commissioning (SITC) of The conference controller shall mandatorily include at the Minimum, or better, a front-panel interface equipped with a USB recording facility for seamless audio capture and a 3.5mm headphone jack that shall be utilized for precise audio monitoring. The device must incorporate, at the Minimum, one RCA audio input and one XLR audio input for superior audio source compatibility, as well as one RCA audio output and one XLR audio output to ensure robust and reliable audio dissemination. Furthermore, the controller shall include a Minimum of six Phoenix audio output connectors, alongside two RJ45 connectors dedicated to digital audio connectivity, ensuring seamless and failproof integration with auxiliary systems. Additionally, there shall be, at the Minimum, or better, two RJ45 interfaces specifically purposed for connection with the chairman unit, delegate unit, unit translators, and associated peripherals. The system must also provide a Minimum of one RJ45 connector for interfacing with a wireless access point or router, and a DP9 male interface explicitly for external control functionalities. Moreover, a DP9 female interface shall be provisioned to establish connections with camera systems, alongside a three-pin Phoenix interface, which must be present for the operation of the camera control keyboard. There shall also be a Minimum of one RJ45 interface enabling connection to a computer system or network switcher, in addition to an obligatory grounding screw for safety compliance and operational stability. The power supply must be capable of operating within the Minimum range of 100 to 240V AC, ensuring adaptability across varied environments, with a static power consumption rate not exceeding 12W and a Maximum operational power consumption capped at 150W or better. The controller must feature a frequency response range spanning a Minimum of 20Hz to 20kHz, a signal-to-noise ratio exceeding a Minimum of 96dB, and a total harmonic distortion that must not exceed 0.05% at any instance. Channel crosstalk should be a Minimum of 85dB, while the dynamic range shall be greater than 94dB or better. Continued .....</p> <p>Ethernet control shall mandatorily be facilitated through a Minimum of one RJ45 connection to a PC, and the unit must be designed to fit within a standard 19" rack for streamlined installation. The conference controller should offer adaptive support for diverse spatial configurations, including circular, square, rectangular, and semicircular setups suitable for classroom and other professional environments. The system shall conform to all necessary and applicable certifications, including, but not limited to, BIS (Indian), CE, FCC, and RoHS, with additional ISO certifications from the OEM, such as ISO 9001, 45001, 50001, 27001, and 14001. An OEM-certified copy of all requisite certifications, The specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant</p>	2.000		NO	One Number	
177	<p>Supply, Installation, Testing, and Commissioning (SITC) of chairman wired tabletop microphone shall, at a Minimum, feature a pluggable gooseneck microphone base, ensuring flexibility in microphone positioning. The microphone must include, at a Minimum, two 3.5mm stereo headphone jacks and two RJ45 connectors, allowing for versatile connectivity and facilitating ease of integration within the system. The user interface shall be designed with a touch-sensitive button interface, providing seamless interaction and control. The microphone shall employ a heart-type capacitance sound pickup pattern, optimizing clarity and accuracy. Equipped with an OLED display measuring 128mm × 32mm, the microphone must, at a Minimum, display essential information, including the microphone's operational status, volume bar, and time span of microphone activation. The microphone's sensitivity shall be rated at a Minimum of -46 dBV / Pa, with a maximum power consumption that must not exceed 2.0W, ensuring energy efficiency. The directivity shall be 0° / 180°, with a rating greater than 20 dB at 1 kHz to ensure excellent sound directionality. The headphone load shall be 16Ω, with a headphone volume output of 10mW via the 3.5mm stereo headphone jack, providing adequate audio clarity and output. The microphone input impedance shall be 2kΩ, with a signal-to-noise ratio (SNR) of at least 70dB to ensure superior audio performance and noise suppression. The frequency response range must span from a Minimum of 20 Hz to 20,000 Hz, ensuring comprehensive sound capture across a broad spectrum of frequencies. Connection to the microphone shall be facilitated via CAT5 or CAT6 cable, utilizing a snap connection to ensure secure and stable signal transmission. The equivalent noise level must be at 20 dBA (SPL), guaranteeing minimal background noise interference. The primary construction material of the microphone shall be ABS, ensuring durability and resilience. The maximum sound pressure level (SPL) shall be 125dB, with total harmonic distortion (THD) below 3%, ensuring the microphone can handle high volumes without distortion. The overall dimensions of the microphone, excluding the gooseneck, shall be 1051 × 120mm × 80mm, ensuring a compact and functional design. The operating temperature range must span from 0°C to +55°C, ensuring reliable performance across diverse environments. The microphone's directivity shall be cardioid, optimized for capturing sound from the intended direction. The sensitivity shall be rated at -46 dBV/Pa, and the frequency response range shall span from a Minimum of 30Hz to 20kHz, with an equivalent noise level of 20 dBA (SPL), ensuring clear and accurate sound capture. The signal-to-noise ratio shall be a Minimum of 296dB, ensuring optimal clarity and noise rejection. The microphone shall be of condenser type, with a Maximum SPL of 125dB at 1 kHz with 1% THD under a 1 kΩ load, ensuring high-quality audio even in challenging acoustic environments. The conference unit connection shall be achieved via a mini 6-pin connector, ensuring secure and efficient data transfer. The input impedance shall be 2kΩ, maintaining consistency and performance across different setups. The working temperature range must be between 0°C and 45°C, with a storage temperature between -20°C and 50°C, ensuring durability and consistent performance in varying conditions. The OLED display shall feature indicators for volume adjustment, MIC ON/OFF status, priority button, and a consent button for delegate management, providing intuitive control and feedback during use. The microphone must be certified to meet the necessary standards, including BIS (Indian), CE, FCC, and RoHS certifications, ensuring compliance with global regulatory requirements. Additionally, the microphone must carry OEM ISO certifications, including ISO 9001, 45001, 50001, 27001, and 14001, affirming the manufacturer's commitment to quality, safety, and environmental management. The specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without any approval material is not considered for installation. End</p>	8.000		NO	One Number	

178	<p>Supply, Installation, Testing, and Commissioning (SITC) of delegate wired tabletop microphone shall, at a Minimum, feature a pluggable gooseneck microphone base, allowing for flexible microphone positioning to accommodate various speaker preferences. The microphone must include, at a Minimum, two 3.5mm stereo headphone jacks and two RJ45 connectors, facilitating versatile connectivity options and ease of integration into the system. The user interface shall feature a touch-sensitive button interface, ensuring a seamless and intuitive user experience. The microphone shall utilize a heart-type capacitance sound pickup pattern, optimizing sound clarity and precision. Equipped with an OLED display measuring 128mm × 32mm, the microphone must, at a Minimum, display essential information such as volume bar, microphone activation time, MIC ON/OFF status, and other relevant operational details. The microphone's sensitivity shall be rated at a Minimum of -46 dBV / Pa, ensuring accurate sound capture across various volumes. The maximum power consumption shall not exceed 2.0W, promoting energy efficiency. The microphone shall have a directivity of 0° / 180°, with a rating greater than 20 dB at 1 kHz, ensuring clear sound directionality. The headphone load shall be 16Ω, with a headphone volume output of 10mW via the 3.5mm stereo headphone jack, providing adequate sound clarity. The input impedance of the microphone shall be 2kΩ, ensuring consistent signal reception, and the signal-to-noise ratio (SNR) must be at least 70dB, ensuring high-quality sound reproduction with minimal noise interference. The microphone's frequency response range must span from 20 Hz to 20,000 Hz, ensuring full-range sound capture. Connection to the microphone shall be facilitated via CAT5 or CAT6 cable, utilizing a snap connection for secure and reliable signal transmission. The equivalent noise level must be at 20 dBA (SPL), ensuring minimal background noise. The main material used in the construction of the microphone shall be ABS, providing durability and resilience in professional environments. The microphone shall have a maximum sound pressure level (SPL) of 125dB with total harmonic distortion (THD) &lt;3%, ensuring clear audio even at high volumes. Continued .....</p> <p>The overall dimensions of the microphone, excluding the gooseneck, shall be 195L × 120W × 60H mm, ensuring a compact design suitable for desktop use. The microphone's operating temperature range shall be from 0°C to +55°C, ensuring reliable performance in a variety of environments. The microphone's directivity shall be cardioid, focusing sound capture on the speaker while rejecting background noise. The microphone's sensitivity shall be rated at -46 dBV/Pa, and its frequency response shall cover a range of 30Hz to 20kHz, providing clear and accurate sound reproduction. The equivalent noise level shall be at 20 dBA (SPL), ensuring minimal interference from background sounds. The signal-to-noise ratio must be a Minimum of ≥96dB, ensuring optimal audio quality. The microphone must be of condenser type, with a maximum SPL of 125dB at 1 kHz with 1% THD under a 1 kΩ load, capable of handling high sound pressure levels without distortion. The conference unit connection shall be via a mini 6-pin connector, ensuring reliable connectivity. The input impedance shall be 2kΩ, maintaining consistent performance across different setups. The working temperature range shall be from 0°C to 45°C, with a storage temperature between 20°C and 50°C, ensuring the microphone remains functional under various conditions. The OLED display shall feature indicators for volume adjustment, MIC ON/OFF status, and other operational information, providing users with easy-to-read feedback during use. The microphone must be certified with BIS (Indian), CE, FCC, and RoHS certifications, ensuring compliance with international standards. Additionally, the microphone must carry OEM ISO certifications, including ISO 9001, 45001, 50001, 27001, and 14001, confirming the manufacturer's commitment to quality, safety, and environmental management. The specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation . End .....</p>	44.000			NO	One Number	
179	<p>Supply, Installation, Testing, and Commissioning (SITC) of DSP unit must be equipped with a minimum of 8 balanced microphone inputs, with the capability to support a minimum of 48V phantom power supply, facilitated by Phoenix connectors. Additionally, the system shall have a minimum of 4 balanced line inputs, also interfaced via Phoenix connectors. For outputs, the system should include at least 6 balanced outputs, connected through Phoenix connectors, ensuring robust and reliable audio signal distribution. A wireless microphone interface, with a minimum of a 3.5mm connector, shall be incorporated to facilitate wireless audio input. Moreover, a monitor headphone interface with a 3.5mm connector must be provided for real-time monitoring of the audio signals. The system shall also include a minimum of 1 USB 2.0 Type A interface, capable of supporting bidirectional audio data transmission. A serial RS-232 port must be available for external connection to a control terminal, ensuring integration with other control systems. The unit shall be equipped with a RESET key, which will serve to restore factory settings, providing an easy method for system recovery. Furthermore, the system should include a minimum of 1 RJ45 interface for external configuration via a computer, facilitating user-friendly setup and configuration processes. The DSP unit shall feature full-band adaptive echo cancellation technology to effectively manage acoustic feedback and reverberation. Automatic reverberation suppression must also be implemented to ensure clean and intelligible audio outputs under various acoustic conditions. The system shall incorporate smart sound mixing and microphone selection technology, ensuring optimal performance in dynamic audio environments. Additionally, dynamic adaptive noise reduction, capable of achieving a minimum reduction of 18dB, shall be included to improve audio clarity by suppressing unwanted background noise. Sampling frequency shall be a minimum of 32kHz, and the system must utilize 24-bit A/D and D/A conversion, guaranteeing high-resolution audio processing. The DSP shall include visual control software designed to simplify panel operations, ensuring that no complex software configuration is necessary and that the system is ready to use immediately after installation. Furthermore, the system shall include RMS and peak value voltage meters, enabling real-time monitoring of signal magnitude, ensuring accurate feedback for optimal performance. Continued .....</p> <p>The signal processing modules within the DSP unit must be abundant, including high pass and low pass filtering capabilities, as well as a 7-band parametric equalization feature. The system must offer comprehensive audio processing functions such as a limiter, compressor, noise threshold, gain control, and feedback suppression, allowing for full customization and fine-tuning of audio output. The mixing capabilities shall include smart mixing and matrix mixing functionalities, providing flexibility in signal routing. A dedicated meter module should be included to monitor signal levels continuously, ensuring that levels remain within desired parameters. In terms of control, the DSP system must allow for volume balance and volume control adjustments, offering comprehensive user control over audio outputs. Frequency response shall range from a minimum of 20Hz to 20kHz at +4dBu, ensuring that the system is capable of reproducing the full spectrum of audio frequencies accurately. Microphone input response shall maintain a tolerance of +0/-2dB, while line inputs shall operate within +0/-0.5dB tolerance. The total harmonic distortion (THD +N) at 1kHz with +4dBu input level shall not exceed 0.009% for microphone inputs and 0.007% for line inputs, ensuring extremely low distortion and high-quality sound reproduction. The equivalent noise level of the system shall be at a minimum of -84dBu (20Hz-16kHz at 22dB), ensuring minimal background noise and maintaining audio integrity. The system's dynamic range shall exceed 105dB within the 20Hz to 16kHz range at 0dB, providing a wide range of audio signals without distortion or loss of detail. The maximum input for balanced microphones shall be at least -20dBu, and for line inputs, the system shall handle up to 20dBu, ensuring flexibility in signal handling. The DSP system must be able to provide a maximum output voltage (balanced) of at least 20dBu and a maximum microphone gain of 50dB, with line inputs offering a 0dB gain. The microphone input impedance shall be a minimum of 2.2kΩ, with line input impedance at a minimum of 20kΩ, ensuring compatibility with various audio equipment. Output impedance shall be at a minimum of 400Ω, allowing for flexible integration into existing systems. The microphone shall be of the condenser type, designed for use with 48V phantom power. It shall feature a providing accurate sound pickup at varying sound levels. Continued .....</p>	14.000			NO	One Number	

	<p>Ø24 back electret condenser transducer and employ JFET impedance transformation with electronic balancing, ensuring precise and reliable signal capture. The microphone shall have an omnidirectional pickup pattern, with a frequency response spanning from 50Hz to 20kHz, ensuring it captures a wide range of frequencies. The microphone's sensitivity shall be a minimum of -44±3dB (0dB=1V/Pa @ 1kHz), DSP Should include Minimum 4 Number of Ceiling Microphone. The rated output impedance of the microphone shall be 2.2kΩ, with a minimum load impedance of 1kΩ, ensuring high performance across various setups. The signal-to-noise ratio (SNR) of the microphone shall be at least 75dB, with a maximum sound pressure level (SPL) of 115dB at 1kHz, THD&lt;1%, providing clear and distortion-free audio even at high volumes. The dynamic range of the microphone shall be at least 104dB within the 20Hz-20kHz range at 2.5kΩ, ensuring excellent audio clarity. The microphone must feature a maximum electrical output level of at least 1.6dBV (20Hz-20kHz, THD&lt;1% at 2.5kΩ) and shall be connected using a mini XLR-3 male connector with twisted shielded mic cable, ensuring a stable and secure connection. The system shall be designed for reliable operation within a working temperature range of 0°C to 45°C and a storage temperature range of -20°C to 70°C (32-113 °F/-4 to 158 °F). Humidity tolerance shall be from 10% to 90% (non-condensing), ensuring performance in various environmental conditions. The color of the system shall be matte black, ensuring a professional and unobtrusive appearance. This equipment shall meet the highest standards of audio performance, reliability, and flexibility, providing a robust and professional solution suitable for demanding environments. The specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation End .....</p>					
180	<p>Supply, Installation, Testing and commissioning (SITC) of 8 x 4" Line-Array Speaker System with LMT shall be designed to meet high-performance audio standards, ensuring optimal sound coverage and clarity in demanding environments. The speaker system shall be rated for a continuous power output of 240W, guaranteeing sustained performance for extended periods. The frequency response of the system shall span from a minimum of 96Hz to a maximum of 16kHz, delivering clear and accurate sound reproduction across a wide frequency range. The system shall feature 8 x 4" long-excursion full-range cone drivers, each designed for maximum efficiency and low distortion. The sensitivity of the system shall be 95dB SPL (1W/1M), providing sufficient sound pressure at a reasonable input power, making it suitable for both small and medium-sized venues. The maximum sound pressure level (SPL) shall reach 110dB continuous and 116dB peak, ensuring that the system can deliver high-output sound without compromising clarity or performance. The transducer sections shall include 8 x 4" (102mm) diameter each capable of handling continuous power ratings of 30W, with program power handling of 60W, and peak power handling of 120W. The voice coils of the transducers shall have a diameter of 25mm (1"), offering improved thermal dissipation and reduced distortion. The magnet material used in the transducers shall be Ferrite, ensuring both cost-effectiveness and durability. The impedance of the system shall be configurable as either series &amp; parallel at 8Ω or discrete at 16Ω x 8, providing flexibility in system configuration and integration into various sound setups. The crossover frequency for the system shall be set at a suggested low-pass filter of 120Hz, using a 24dB/octave slope to ensure smooth transition between frequency ranges and prevent distortion. This will allow for optimal performance in a variety of acoustical environments. The enclosure of the speaker system shall be constructed from 12mm, 7-ply birch faced plywood, providing a sturdy and acoustically favorable trapezoidal design that enhances sound projection. Continued .....</p> <p>The grille shall be made from 16-gauge perforated steel, powder-coated in black, and backed by charcoal foam to protect the internal components while ensuring maximum acoustic transparency. The surface finish shall be SoundFlex® environment-friendly coating, providing an aesthetic, durable, and environmentally responsible finish. For mounting, the system shall include 4 x M6 mounting points and a wall bracket for versatile and secure installation, ensuring that the speaker can be positioned optimally for sound coverage in various room configurations. The speaker shall offer a coverage pattern of 100° horizontal by 100° vertical, ensuring consistent and wide sound dispersion across the listening area. The input connectors shall be configured for 100 Volt operation, utilizing SL4MP connectors (X2) with an additional parallel connection option for easy daisy-chaining or connecting to other systems. This ensures secure and efficient audio signal transmission across multiple speakers in a setup. he specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation End .....</p>	40.000			NO	One Number
181	<p>Supply, Installation, Testing and commissioning (SITC) of 4 Ceiling Speaker shall have The passive ceiling speaker with a minimum cutout size of Ø210mm (Ø8.3") or better and a mounting depth of at least 87mm (3.4") excluding drywall. It shall feature a woven glass fiber cone woofer of no less than 6.5 inches in size and a single unit or better, combined with dual titanium dome tweeters of 0.75 inches each or better, ensuring accurate high-frequency reproduction. The frequency response shall cover a minimum range of 55Hz to 20kHz or better, with a sensitivity of at least 90dB (1M/1W) and a nominal impedance of 8Ω or better. RMS power handling must not be less than 60W or better, with binding post input connectivity. The frameless grill design shall support both round and square options, ensuring a clean, built-in appearance. The woofer surround shall use butyl rubber for durability and superior bass performance. Installation must utilize a dog-leg mounting system for ease of setup. The speaker shall include an environment equalizer with a minimum range of ±3dB or better, ensuring sound can be tailored to room acoustics. An advanced crossover design shall deliver an open, balanced, and dynamic sound signature. The titanium dome tweeters and woven glass fiber woofer shall ensure extended bass output, minimal distortion, and precise sound reproduction. The dual-tweeter setup must provide wider dispersion and better sound coverage for small spaces, resulting in optimal audio performance. he specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation</p>	56.000			NO	One Number
182	<p>Supply, Installation, Testing and commissioning (SITC) of 4 channel amplifier amplifier system shall be designed with a minimum power output capability of 1000W per channel at 4Ω and shall support 8Ω configurations with the same output rating of 1000W per channel, while also being compatible with 70/100V line applications at a minimum of 4x1000W or better. The amplifier shall ensure a THD+N value of less than 0.05% under typical conditions, measured across a frequency range of 20 Hz to 20 kHz with an 8Ω load and 3 dB below the rated power. The signal-to-noise ratio shall be no less than 120 dB (A-weighted), maintaining clarity and precision across the entire frequency spectrum. The frequency response shall span from 20 Hz to 20 kHz with an accuracy of ±0.25 dB or better at rated power and ±0.15 dB at 1 dB below the rated power, with an 8Ω load, ensuring high fidelity. The amplifier shall utilize a Class D output circuitry, incorporating a full-bandwidth PWM modulator for ultra-low distortion. The input impedance shall not be less than 15 kΩ balanced, with a damping factor exceeding 2000 at 8Ω load, 1 kHz, and below, guaranteeing superior control of the connected transducers. The gain and level adjustments shall be configurable, with amplifier gain selectable at minimum sensitivity levels of 0.7V, 1.0V, and 1.44V, and level adjustment for each channel available via front-panel potentiometers. A front-panel power switch shall be provided for operational control. Cooling shall be achieved through fan-based front-to-rear airflow mechanisms, maintaining optimal thermal conditions. The system shall include comprehensive protection circuits such as input limiters, short circuit protection, DC output protection, under/overvoltage protection, SOA (Safe Operating Area) protection, intelligent mains fuse protection, power stage overload protection, and temperature protection for transformers. The power supply system shall be of a universal and regulated switch-mode type, with integrated Power Factor Correction (PFC) and operational voltage compatibility ranging from 90V to 270V AC. The protection systems shall include clip limiting, SOA protection, DC protection, overcurrent detection, thermal safeguards, mains overvoltage detection, and fuse protection mechanisms. Front-panel indicators for each channel shall include 0dB, Signal, Continued .....</p>	17.000			NO	One Number

	<p>Limit, and Protect status LEDs, with parallel configuration available for Channels 1 &amp; 2 and 3 &amp; 4. Input connectors shall comprise electronically balanced 3-pin XLRs for each channel, and output connectors shall include 4-pin Speakon connectors configured as +1/-1 for CH-1, +2/-2 for CH-2 on one Speakon and +1/-1 for CH-3, +2/-2 for CH-4 on the other. The Digital Signal Processor (DSP) shall operate at a minimum resolution of 32-bit / 96kHz, providing 4 input and 4 output channels with control available via USB. A minimum of 20 presets shall be supported, with each input featuring a 10-band equalizer (PEQ / LS6 / LS12 / HS6 / HS12 / APF), volume adjustment from -60dB to +5dB, and delay capabilities up to 4.99ms. Each output shall also feature a 10-band equalizer (PEQ / LS6 / LS12 / HS6 / HS12 / APF / APF-1), delay adjustment up to 9.99ms, limiting from -19dB to 0dB, and crossover options for HPF and LPF. Input and output linking shall be provided, with inputs linkable as A, B, C, and D and outputs linkable across channels 1 through 4. he specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is</p>					
183	<p>Supply, Installation, Testing and commissioning (SITC) of Motorized Podium shall be a minimum of 27" with a resolution of 3840x2160 (pixels) utilizing a backlight type that shall ensure an enhanced visual experience. The brightness should be no less than 400 cd/m² or better to ensure sufficient luminance under various lighting conditions. The contrast ratio shall be at a minimum of 1000:1 or better, ensuring vivid and deep color contrasts. The response time should be no greater than 14ms or better, allowing for smooth transitions and minimal blurring during high-motion content. The pixel pitch shall be no less than 0.1554mm (H) x 0.1554mm (V) to ensure fine detail resolution. The viewing angle should be at a minimum of 178° (H) and 178° (V) or better, ensuring uniform visibility across the screen from various angles. The lifespan of the display shall be a minimum of 30,000 hours or better, guaranteeing prolonged performance. The color gamut should cover a minimum of 72% (typical) of NTSC or better for true-to-life color reproduction. The viewable area should be no less than 596.736mm x 335.664mm or better, providing ample space for clear visuals. The display shall support a color depth of no less than 1.07 billion colors, ensuring rich and accurate color reproduction. The system shall be based on Android 12 OS or better, with an internal cache capacity of no less than 8GB DDR4 RAM or better, and a minimum internal storage of 64GB (ROM) or better for responsive performance and ample storage. The voltage requirements should be DC 20V/5A, with a maximum power consumption of no greater than 100W, and a standby power consumption should be no greater than 0.5W to ensure energy efficiency. The Wi-Fi standard must comply with IEEE 802.11a/b/g/n/ac with an operating frequency of no less than 2.4GHz/5GHz or better. Bluetooth connectivity should support versions 2.1+EDR, 4.2, and 5.2 for a wide range of device compatibility.</p> <p>The system should feature one HDMI input, supporting HDMI2.1 with a maximum resolution of no less than 3840x2160@60Hz or better, and one Type-C output that shall support a maximum resolution of 3840x2160@60Hz or better, with a DP1.2 version. Additionally, there should be two USB-A ports supporting images, music, and video file playback, though upgrade capabilities are not supported. The interface should include one HDMI output capable of looping out all signals, supporting a maximum resolution of 3840x2160@60Hz or better, with a version of HDMI2.1 (TMDS), and one RJ45 Ethernet interface supporting 10M/100M/1000M Base-T self-adaptive for reliable network connectivity. The system should feature a Type-C input (power interface) for charging, and the power supply (adapter) shall provide DC 20V/5A to ensure stable operation. The bare machine dimensions shall not be less than 775.6mm * 526mm * 1118mm or better, with support for base elevation and rotation adjustments, ensuring ergonomic flexibility. The following accessories should be included as part of the package: one stylus, one adapter, two gooseneck microphones, one 5-meter HDMI cable, one 1.8-meter Type-C cable, and one optional screen sharing dongle. Furthermore, the system shall include a qualified certificate label, instruction manual, and warranty card for user guidance and after-sales support. The environmental storage humidity shall be no less than 10% and no greater than 90% non-condensing, while the working humidity should be between 20% and 85% non-condensing. The system should be capable of operating in temperatures between 0°C and 40°C, with a storage temperature range from -10°C to +60°C or better, ensuring resilience in diverse conditions. he specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation</p>	2.000			NO	One Number
184	<p>Supply, Installation, Testing and commissioning (SITC) of speakerphone shall incorporate both USB and Bluetooth connectivity, facilitating seamless integration with various devices and networks. It shall be equipped with a built-in microphone array consisting of no less than 12 microphones, enabling optimal voice capture within a radius of no less than 6 meters. The speaker shall deliver a volume output no less than 95dB, ensuring clear and audible sound in all conditions. The sampling rate of the system shall be no less than 48KHz to ensure high-fidelity audio performance. The voice pickup pattern shall encompass a full 360° to capture audio from all directions. The interfaces of the speakerphone should include, at a minimum, Type-B, RJ9, line in/out, and DIN6 connectors, ensuring versatility in connectivity options. The frequency response of the microphones shall span from no less than 100Hz to no greater than 22KHz, ensuring broad and accurate capture of voice frequencies. Similarly, the speaker frequency response shall extend from no less than 100Hz to no greater than 22KHz, ensuring rich and clear sound reproduction. The voice pickup range shall be capable of reaching no less than 3 meters, ensuring effective audio capture in medium-sized meeting rooms. The system shall support echo length cancellation of no less than 500ms and deep echo cancellation of no less than 65dB, ensuring clarity in voice communication even in environments with significant reverberation. Two-way noise compression shall meet or exceed ≥18dB, minimizing ambient noise and enhancing voice clarity. The built-in 3A algorithm shall be incorporated, providing AEC (Acoustic Echo Cancellation), ANS (Automatic Noise Suppression), and AGC (Automatic Gain Control) for optimal audio quality.</p> <p>The speakerphone shall include a built-in rechargeable battery with a minimum capacity of 3.7V and 5200mAh, ensuring extended operation without the need for frequent recharging. Additionally, the system shall come with a cable of no less than 3.5 meters in length to facilitate flexible placement, along with two external expansion microphones connected via RJ9 cables. Each external microphone shall support a pickup range of no less than 2 meters, ensuring comprehensive coverage of larger meeting areas. The supplier shall ensure that the product complies with all relevant certifications, including but not limited to BIS (Indian), CE, FCC, and RoHS, guaranteeing adherence to international standards. he specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by</p>	4.000			NO	One Number
185	<p>Supply, Installation, Testing and commissioning (SITC) of touch screen panel shall have a 7-inch capacitive touch screen with a resolution of 800 x 480, providing a responsive and user-friendly interface. The firmware should be upgradable via USB 2.0, ensuring ease of updates and maintenance. Control should be facilitated through RS-232 (RJ-45), allowing for reliable and versatile connectivity. The panel shall be powered by DC 12V and should support Power over Ethernet (PoE) in compliance with the 802.3af standard, enabling both data and power transmission over a single cable. The power consumption would be a maximum of 10W, ensuring energy efficiency touch panel would serve as an optimal assistant for virtual studio systems, equipped with pre-installed presets for common operations. It shall provide an intuitive interface that can be managed with simple finger taps, allowing users to switch between multi-camera virtual studio modes, control downstream key functions, and recall various virtual studio presets with ease. It must support live streaming and recording, enabling users to conduct virtual productions seamlessly. e touch panel shall allow the installation of up to 4 virtual studios in its application. Users can select their desired virtual scene mode directly, providing swift recall of the corresponding virtual scene. It must be compatible with 4K chroma keyers, supporting features such as LumaKey, background blur, and auxiliary layer swap functions. Customization of each button shall be possible, allowing users to tailor the interface to their needs. The panel's PoE functionality should ensure that both data and power can be provided through a single cable, simplifying setup and reducing cable clutter. One specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation. End</p>	1.000			NO	One Number

186	Supply, Installation, Testing and commissioning (SITC) of USB Switch meeting or exceeding the following minimum technical requirements: The system shall have minimum computer connections including 4 x USB Type B Female (Blue) and 4 x USB Type A Female (Blue), 1 x 5-pin Terminal Plug (Green) for serial connection, and 1 x 2-pin 9-24V Terminal Plug (Green) and 1 x 12V DC Jack Female (Black) for power connection. The system shall meet minimum power consumption requirements of DC12V: 0.376W; 117BTU/h and DC24V: 0.48W; 117BTU/h, with power mode selection via terminal block or DC jack, and optional power adapter (Part No.: 0AD8-8012-33MG). The system shall have minimum port selection capabilities via remote port selector or serial command, with LED indicators for selected port (Green), serial RS422 (Orange), and RS485 (Green). The system shall meet minimum cable length requirements including 2x USB 3.2 Gen 1 Type-B to Type-A Cables (1.2M and 1.8M) and remote port selector (1.8M). Compliance on OEM Letterhead he specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation End.....	16,000			NO	One Number	
187	Supply, Installation, Testing and commissioning (SITC) of 1:4 HDMI distribution amplifier that shall have one HDMI video input for a connector of Type-A female HDMI. The amplifier shall support HDMI input resolution of up to 4K@60Hz 4:4:4 8bit, conforming to HDMI Standard 2.0 and HDCP Version 2.3, and shall be CEC supported. The video output shall include four HDMI outputs, each with a Type-A female HDMI connector, capable of supporting HDMI output resolution of up to 4K@60Hz 4:4:4 8bit. The HDMI output shall support up to 5V 200mA power for AOC cable and shall comply with HDMI Standard 2.0, HDCP Version 2.3, and 1.4 compliant CEC support control, the device shall include one EDID 4-pin DIP switch and one Micro-USB port. The general bandwidth shall be 18Gbps, and the HDMI V2.0 cable length specifications shall include a maximum of 5m for 4K@60Hz 4:4:4, up to 15m for 4K@60Hz 4:2:0, and up to 20m for 1080p. The operation temperature shall range from -5 to +55°C (+23° to +131°F), while the storage temperature shall range from -25 to +70°C (-13° to +158°F). The relative humidity shall be between 10% to 90%, non-condensing power supply shall accept an input of 100V~240V AC, with an output of 5V DC 1A. The power consumption shall not exceed 2.5W (Max). he specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item	16,000			NO	One Number	
188	Supply, Installation, Testing and commissioning (SITC) of The 4K HDMI audio embedder/de-embedder shall feature a single HDMI input connector, designed as a 19-pin Type-A female HDMI 2.0, with support for HDCP 2.2. The output interface shall include one HDMI output connector, also a 19-pin Type-A female HDMI 2.0, compatible with HDCP 1.4, ensuring seamless video pass-through. For audio output, the device shall provide comprehensive options, including one stereo balanced audio L/R output, one analog audio L/R output, and one coax digital output. These outputs shall feature connectors such as a 5-pin Phoenix connector, an RCA jack, and a coaxial connector, catering to a range of audio systems. The stereo analog audio format shall support PCM, while the coaxial digital audio format shall accommodate LPCM 2CH, Dolby Digital 2/5:1CH, and DTS 2/5:1CH. The device shall support a maximum data rate of 18 Gbit/s and handle resolutions up to 4Kx2K at 60Hz with a 4:4:4 color format, ensuring optimal video and audio quality. Operational reliability shall be maintained within a temperature range of -10°C to 55°C and a humidity range of 10% to 90%. The device shall consume a maximum of 3W of power and require a power supply input of 100-240VAC at 50/60Hz, with an output specification of 12VDC 1A he specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation End.....	16,000			NO	One Number	
189	Supply, Installation, Testing and commissioning (SITC) of Wireless Lapel Microphone System with Built-in Automatic Frequency Selection (AFS) technology, operating in UHF mode, with a minimum frequency range of 522-930 MHz and a minimum operating bandwidth of 134 MHz. The system shall incorporate Anti-interference technology with Noise Lock Squelch, effectively blocking stray RF interference. The microphone shall have a minimum frequency response of 45 Hz to 18 kHz. The Signal-to-Noise Ratio (SNR) shall be a minimum of 104 dB or better. The RF output power shall be a minimum of 10/40 mW. The system shall allow for a minimum of 24 sets to be used simultaneously using multiple frequency bands in one venue. The microphone element shall be removable and of Dynamic/Condenser type. he specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation End.....	28,000			NO	One Number	
190	Supply, Installation, Testing and commissioning (SITC) of Wireless Handheld Microphone System with built-in Automatic Frequency Selection (AFS) technology, operating in UHF mode, with a minimum frequency range of 522-930 MHz and a minimum operating bandwidth of 134 MHz or better. The system shall incorporate anti interference technology with Noise Lock Squelch, effectively blocking stray RF interference or better. The microphone shall have a minimum frequency response of 45 Hz to 18 kHz or better. The Signal-to-Noise Ratio (SNR) shall be a minimum of 104 dB or better. The RF output power shall be a minimum of 10/40 mW or better. The system shall allow for a minimum of 24 sets to be used simultaneously using multiple frequency bands in one venue or better. The microphone shall have a die-cast metal body and a microphone element of Dynamic or better quality, complete with all necessary accessories. he specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not	28,000			NO	One Number	
191	Supply, Installation, Testing and commissioning (SITC) of Matrix Switcher shall be designed to offer a minimum of four HDMI video input connectors, each being 4 x Type-A female HDMI video inputs. The video resolution capability shall support up to 4K@60Hz 4:4:4, ensuring high-quality video output across all connected sources. The video output shall consist of four HDMI video output connectors, specifically 4 x Type-A female HDMI video outputs, which shall maintain the same video resolution of up to 4K@60Hz 4:4:4 for consistent and high-performance video transmission. The HDMI output shall support active optical cable (AoC) connections with up to 5V500mA to ensure robust signal transmission over longer distances. The HDMI version supported shall be up to 2.0, and the HDCP version shall be up to 2.3, ensuring compatibility with the latest digital content protection standards. The audio signal transmitted via HDMI shall support LPCM 7.1 audio, Dolby Atmos®, Dolby® TrueHD, Dolby Digital® Plus, DTS™, and DTS-HD® Master Audio™ pass-through capabilities, delivering immersive audio quality in multi-channel setups. For digital audio signal output, the switcher shall feature four digital SPDIF audio output connectors, specifically 4 x Toslink connectors. The digital SPDIF audio format shall support PCM, Dolby Digital, DTS, and DTS-HD. The frequency response for digital SPDIF audio shall span from 20 Hz to 20 kHz, with a tolerance of ±1dB, ensuring accurate audio reproduction. The maximum output level for the digital SPDIF audio shall be ±0.05dBFS, and the total harmonic distortion plus noise (THD+N) shall be no greater than < 0.05% within the 20 Hz – 20 kHz bandwidth, measured using a 1 kHz sine wave at 0dBFS level (or maximum level). The signal-to-noise ratio (SNR) shall be no less than 90dB, ensuring clear and high-quality audio reproduction. For analog audio output, the matrix switcher shall feature four analog L/R audio output connectors, specifically 4 x L&R (RCA). The digital SPDIF audio format for analog output shall support PCM 2CH, with a frequency response from 20 Hz to 20 kHz, ±1dB, and a maximum output level of 2.0Vrms ± 0.5dB. The THD+N for analog audio output shall be no greater than < 0.05% over the 20 Hz – 20 kHz bandwidth, with measurements made under the same sine wave conditions. The signal-to-noise ratio for analog output shall be no less than 90dB, and the crosstalk isolation shall be no greater than < -80 dB, ensuring high fidelity audio. The left-right level deviation shall be no greater than < 0.05 dB, with the frequency response deviation maintained within ± 0.5dB across the 20Hz - 20KHz range. The output load capability shall support 1k ohm and higher, accommodating up to ten paralleled 10k ohm loads, while maintaining noise specifications at -80dB. Control ports shall include 1 x IREYE, 1 x RS232, 1 x FIRMWARE, and 1 x TCP/IP to ensure versatile control options for integration into various systems. The control connectors shall feature 1 x 3.5mm jack, 1 x 3-pin terminal block, 1 x USB-A, and 1 x RJ45, facilitating flexible communication with external devices. The general transmission distances shall be defined as follows: 4K/60Hz/444 at 5m, 4K/60Hz/420 at 10m, and 1080P at 15m, ensuring reliable signal integrity across varying distances. he specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation End.....	14,000			NO	One Number	

192	Supply, Installation, Testing and commissioning (SITC) of 8x8 Matrix Switcher shall be equipped with a minimum of eight HDMI video input connectors, each being 8 x Type-A female HDMI video inputs. The device shall support video resolution up to 4K@60Hz 4:4:4, ensuring high-definition video quality for both input and output signals. The video output shall consist of eight HDMI video output connectors, also 8 x Type-A female HDMI video outputs, maintaining the same video resolution of up to 4K@60Hz 4:4:4 to preserve the integrity of the video signal across multiple displays. The HDMI output shall support up to 5V500mA for active optical cable (AoC) connections, facilitating long-distance transmission with minimal signal loss. The HDMI version shall be compliant with up to version 2.0, and the HDCP version shall be compliant with up to version 2.3, ensuring compatibility with the latest video and content protection standards. The HDMI audio signal shall support LPCM 7.1 audio, Dolby Atmos®, Dolby® TrueHD, Dolby Digital® Plus, DTS™, and DTS-HD® Master Audio™ pass-through capabilities, offering an immersive and high-quality audio experience through all connected devices. For digital audio signal output, the switcher shall include eight digital SPDIF audio output connectors, specifically 8 x Toslink connectors. The digital SPDIF audio format shall support PCM, Dolby Digital, DTS, and DTS-HD. The frequency response for audio output shall range from 20 Hz to 20 kHz, with a tolerance of ±1dB, ensuring accurate and high-fidelity sound reproduction. The maximum output level shall be ±0.05dBFS, and total harmonic distortion plus noise (THD+N) shall be < 0.05% within the 20 Hz – 20 kHz bandwidth, measured with a 1 kHz sine wave at 0dBFS level (or maximum level). The signal-to-noise ratio (SNR) shall be greater than 90dB within the same bandwidth. For analog audio output, the matrix switcher shall feature eight analog L/R audio output connectors, specifically 8 x L&R (RCA). The digital SPDIF audio format for analog output shall support PCM 2CH, with a frequency response from 20 Hz to 20 kHz, ±1dB, and a maximum output level of 2.0Vrms ± 0.5dB. The THD+N for analog audio output shall be < 0.05% over the 20 Hz – 20 kHz bandwidth, maintaining the same sine wave measurement conditions as specified above. The signal-to-noise ratio for analog audio output shall be > 90dB, and the crosstalk isolation shall be < -80 dB, ensuring minimal interference between channels. The left-right level deviation shall be < 0.05 dB, with frequency response deviation within ± 0.5dB across 20Hz - 20KHz. The output load capability shall support 1k ohm and higher, accommodating up to ten paralleled 10k ohm loads, with noise specifications at -80dB to maintain high-quality audio. Control ports shall include 1 x IR EYE, 1 x RS232, 1 x FIRMWARE, and 1 x TCP/IP for flexibility in system control and integration with external devices. The control connectors shall feature 1 x 3.5mm jack, 1 x 3-pin terminal block, 1 x USB-A, and 1 x RJ45, allowing for seamless communication with other devices and networks. he specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by	2.000			NO	One Number	
193	Supply, Installation, Testing and commissioning (SITC) of display shall possess a 55-inch size, utilizing a Slim DLED backlight type, ensuring enhanced brightness of 500 cd/m² for clear and vibrant visuals. It shall feature a native resolution of 3840 x 2160 (16:9) UHD, offering sharp, high-definition clarity for professional use. The contrast ratio shall be a minimum of 1200:1 (typical), with a dynamic contrast ratio of 50000:1, providing superior depth of blacks and rich, vivid colors. The panel lifetime shall meet or exceed 50,000 hours, ensuring longevity and reliability, and the response time shall be 8ms, facilitating smooth and fluid on-screen performance. The active display area dimensions shall be 1209.6 mm (H) × 680.4 mm (V), ensuring large and immersive viewing. The viewing angle shall be 178° both vertically and horizontally, maintaining consistent image clarity and color accuracy from wide viewing positions. The screen shall support 1.07 billion colors (8-bit + FRC), providing a rich and lifelike color spectrum. A 3H screen treatment shall be applied for durability, and the haze level shall be kept at 1%, enhancing the clarity of the display. The refresh rate shall be 60Hz, ensuring smooth visuals during extended usage. The display shall be designed specifically for landscape orientation and intended for indoor use, operating reliably up to 16 hours per day, 7 days a week. The built-in system shall include a mainboard model 17MB135VS, providing reliable performance for long operational hours. Connectivity options shall include VGA (DE-15P) input, 2x HDMI 2.0, 2x USB 2.0, and an internal USB 2.0 for video input. Audio output shall be provided through a headphone jack and Optic SPDIF connector. For external control, the display shall support RS232C, RS485, IR, and Serial (RS485) interfaces with external devices. The display shall operate effectively within an environmental temperature range of 0-40°C and a humidity range of 10-90%, ensuring consistent performance in varying environmental conditions. The required power supply shall be 110 VAC - 240 VAC - 50/60 Hz, with typical power consumption of 138 W, a maximum power consumption of 180 W, and a deep standby power consumption ≤0.5 W, ensuring energy efficiency when not in active use. Key features shall include support for open content management, a scheduler, USB-Autoplay, Auto Launch, HDMI-CEC, HDMI-Wakeup, Auto-switch on failover, panel lock, OSD rotation, No Signal Power Off, screen saver, pixel shift, and videowall support. The display shall support remote control via LAN and feature a real-time clock for time-sensitive applications. Mechanical features shall include a joystick, rocker switch, detachable power cable, detachable logo, internal USB cover, compatibility with a 30-degree tilting installation, and overlay touch kit compatibility, providing flexibility in installation and interaction. Optional features for enhanced functionality may include SDM or OPS compatibility, embedded IR, and an IR extender option. Audio output shall be facilitated by 2x10 W built-in speakers, ensuring adequate sound for general use, making the display a well-rounded solution for various professional environments. he specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be	10.000			NO	One Number	
194	Supply, Installation, Testing and commissioning (SITC) of kiosks shall have LED monitor with a screen size ranging from 46 inches to 55 inches, constructed from durable mild steel to ensure longevity and robustness. The operating voltage will be 230V AC, and each unit will come with a one-year warranty, providing assurance of quality and reliability. Kiosks will have an aspect ratio of 16:9, equipped with a minimum of 4GB RAM and powered by an Intel Dual Core, i3, i5, or ARM Cortex processor to handle various applications efficiently. The brightness of the screens will exceed 300 nits, ensuring visibility in various lighting conditions, and each unit will offer a minimum of 1TB of HDD storage for ample data management. Connectivity options will include WiFi, LAN, Bluetooth, USB 2.0, and USB 3.0, enabling seamless integration with other devices and networks. The kiosks will operate effectively in an environment with temperatures ranging from 0 to 45 degrees Celsius and humidity levels up to 85%. Designed for standalone floor mounting, these kiosks will support multi-touch functionality, allowing multiple users to interact with the system simultaneously. The touch accuracy will be maintained at 99%, and feature a capacitive touch screen for a responsive user experience. The operating system will support both Windows 10 and Android, providing flexibility in software deployment. The screen resolution will be 1920x1080, ensuring high-quality visuals. Additional features will include a printing facility and vandal-resistant glass to protect the display. Branding options will be available through vinyl, laser-cut logos, or backlighting, and the kiosks will accommodate peripherals as required will utilize customized software to enhance user experience and functionality. The enclosure will feature powder coating and should be available in any color to match the aesthetic requirements of the installation environment. The kiosks will be capable of handling various functions such as payment processing, service applications, information checks, document printing, and check-ins.	2.000			NO	One Number	
195	Supply, Installation, Testing and commissioning (SITC) of integrated, all-in-one display system shall be provided with a diagonal screen size of no less than 130 inches, utilizing a 1212 LED type screen. The display shall exhibit a screen size of a minimum of 2885mm in width, 1659mm in height, and 50mm in depth. The physical display area shall feature a display size with a minimum width of 2880mm and height of 1620mm, ensuring an optimized screen-to-frame ratio for various applications. The pixel configuration shall be no less than 1872 pixels in width and 1053 pixels in height, inclusive of the frame and rim, ensuring fine image detail for high-resolution output. The display shall exhibit a standard brightness of no less than 500 nits, ensuring adequate luminosity for visibility in diverse ambient lighting conditions. The refresh rate of the display shall be a minimum of 3840Hz or better, delivering high clarity and smooth transitions for moving visuals. The contrast ratio shall be at least 4000:1, ensuring clear differentiation between light and dark areas, thus providing an immersive viewing experience. The color temperature must be adjustable within a range from a minimum of 2500K to 9500K, ensuring the ability to optimize visual output according to environmental and user preferences. The system's viewing angle, both horizontal and vertical, shall be no less than 160° and 140° respectively, ensuring wide-angle visibility without significant degradation in color or clarity, even at extreme viewing positions. The AC operating voltage of the system shall range between a minimum of 100V to a maximum of 240V, ensuring compatibility with global electrical standards and flexibility for diverse installation environments.	1.000			NO	One Number	

	<p>The maximum power consumption of the display shall not exceed 1783W, with an average power consumption of no more than 595W, ensuring efficient energy use while maintaining high performance. The integrated display shall operate on the Android 8.0 system, which shall be configured with a minimum of 4GB DDR4 system memory, ensuring smooth multi-tasking and processing capability. The storage capacity of the display shall be no less than 16GB eMMC 5.1, allowing for ample space to store system files, applications, and data necessary for the display's operation. The control interface shall feature at least one MiniUSB port and one RJ45 port, ensuring convenient connection for both local control and network management. Input/output interfaces shall include no less than three HDMI 2.0 inputs, ensuring compatibility with a variety of external video sources, and at least one USB 2.0 and three USB 3.0 ports, allowing for versatile device connectivity. Audio output shall be supported through at least one Audio OUT port, and the system must also feature an SPDIF OUT port for digital audio output, alongside an additional RJ45 port for further networking options. The display shall be suitable for operation in environments with a minimum storage temperature ranging from -40°C to +60°C, ensuring reliable performance even in extreme climatic conditions. The operating temperature range shall be no less than -10°C to +40°C, providing flexibility in both indoor and outdoor settings. In addition, the storage humidity range shall be no less than 10% to 85% relative humidity, with the operating humidity range not exceeding 10% to 80% relative humidity, guaranteeing stable operation in diverse environments. The system shall be rated with a minimum IP40 front rating and an IP21 rear rating, ensuring adequate protection against ingress of solid objects and moisture, suitable for both indoor and outdoor installations. The system shall be supplied with all necessary hardware, including controllers and any additional components as required for on-site installation, ensuring that the complete system is ready for integration into the intended environment. The specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization along with the technical bid, accompanied by a compliance statement on the OEM's official letterhead and take item and Design approval from Consultant End .....</p>						
196	<p>Supply, Installation, Testing and commissioning (SITC) of signal cable shall feature a high-quality PVC jacket with an outer diameter of ø 8.80 mm, presented in marine blue for clear identification and durability. The cable's shielding shall be composed of two layers: Shield No. 1 and Shield No. 2, each constructed with bare copper wires (0.10 mm), providing 100% coverage for optimal signal integrity and protection against electromagnetic interference. The internal structure shall include a polyester nonwoven layer, thermally bonded and coated on both sides with aluminum for enhanced separation and shielding capabilities. A viscose filler material shall provide structural integrity and separation within the cable, ensuring robustness in installation and use. The conductor shield layer shall similarly consist of a polyester nonwoven material, thermally bonded and coated on both sides with aluminum, further bolstering the cable's electromagnetic shielding. The conductive copper shield shall also employ bare copper wires (0.10 mm) with 100% coverage, maintaining the cable's high performance and reliability. The insulation of the cable shall be cellular polyethylene (PE), with an outer diameter of ø 2.00 mm, ensuring excellent dielectric properties and durability. Four distinct colors shall be used for easy conductor identification, facilitating accurate and efficient installation. The conductor material shall consist of stranded bare low-capacitance oxygen-free copper (LCOF) wires, with a configuration of 64 x 0.10 mm strands, yielding a cross-sectional area of 0.50 mm² per conductor. This construction ensures high conductivity and low signal attenuation, suitable for demanding professional applications. The OEM shall provide written authorization, submitted alongside the technical bid, certifying that the equipment meets all specified standards and specifications. This documentation shall guarantee that only high-quality, reliable components are used. Compliance with these standards ensures that the cable operates at peak efficiency</p>	1000.000			MTR.	One Meter	
197	<p>Supply, Installation, Testing and commissioning (SITC) of speaker cable shall possess a jacket of flame-retardant PVC, with a diameter of Ø 9.4 mm and a chromatic hue of black, thereby ensuring a robust and fire-resistant exterior. The insulation shall comprise PVC, with a diameter of Ø 3.9 mm and a dichromatic color scheme of black and red, thereby facilitating a precise and nuanced signal transmission. The conductor shall consist of (OFC) stranded bare copper wires, with a quantification of 224 x 0.15 mm, thereby yielding a cross-sectional area of 3.96 mm², and a gauge of 224 x 34 AWG, equivalent to 11 AWG, thereby ensuring a high degree of conductivity and flexibility. The jacket shall be rated as flame retardant PVC, in accordance with the IEC 60332-3 standard, thereby guaranteeing a high level of fire resistance. The electrical properties shall include a conductor resistance of less than 4.65 ohm/km, and a test voltage of 2000 Veff, thereby ensuring a precise and reliable signal transmission. The temperature range shall be dichotomized, with a flexible installation range of -5° to +50° C, and a fixed installation range of -30° to +70° C, thereby accommodating diverse environmental conditions. The maximum load shall be quantified as 24.0 Ampere/Line, with a rotational flexibility of 360°, and a pitch per meter of 7.14, equivalent to 140mm, thereby ensuring a high degree of flexibility and versatility. The specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not</p>	2500.000			MTR.	One Meter	
198	<p>Supply, Installation, Testing and commissioning (SITC) of Fiber optic HDMI cable, boasting a length of 20 meters and equipped with connectors, shall be capable of maintaining a 90-degree cable angle, thereby ensuring a precise and nuanced signal transmission. This high-speed HDMI to HDMI cable, with a bandwidth of 18Gbps, shall support subsampling rates of 4:4:4/2:2:4/2:0, thereby facilitating the transmission of high-definition video signals, including HDTV, 3D, and 2160p/1080p resolutions. Furthermore, this cable shall be compatible with HDCP2.2, Ethernet, ARC, HDR, Ultra HD, and UHD 4K, thereby ensuring a high degree of versatility and compatibility. The cable shall support high-speed data transfer rates of 18Gbps, with capabilities for HDR, CEC, EDID, and HDCP2.2, thereby guaranteeing a precise and reliable signal transmission. Additionally, the cable shall support uncompressed audio and video sync, with a maximum resolution of 4K@60Hz, and a maximum audio sampling rate of 1536KHz. The specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not</p>	36.000			NO	One Number	
199	<p>Supply, Installation, Testing and commissioning (SITC) of The USB Cable as on required on Size shall feature connectors of Type A Male to Type A Female and shall support all USB 3.0 devices, explicitly not compatible with USB 2.0/1.1 standards. The device shall enable data rates of up to 5Gbps, ensuring high-speed data transfer for supported devices. It shall be universally compatible with major operating systems, including Windows, Mac OS, and Linux, ensuring seamless integration across diverse platforms. The device shall not require any external power supply and shall be intended exclusively for use with self-powered peripherals. Installation shall be straightforward with a Plug and Play design, eliminating the need for additional drivers or software configuration. The extender shall support a maximum distance of up to 100 meters (328 feet) over an active optical link, making it suitable for extended range applications. The material construction shall incorporate fiber-optic technology to ensure noise-immune data transfer at speeds up to 5Gbps across extended distances. The device shall feature high-quality USB-molded connectors for enhanced durability and reliability. The maximum supported length of the extension shall be 100 meters, maintaining performance integrity throughout the length. This adherence to specified standards and features ensures that the system is optimized for high-performance, long-distance data transfer requirements, meeting the rigorous demands of professional and industrial environments. The specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant</p>	50.000			NO	One Number	

200	Supply, Installation, Testing and commissioning (SITC) of Meeting Participant Solution Including 22 No of Meeting Name Plate Device should be based on Dot matrix e-paper Based Technology Meeting Name Plate Device should have battery backup of should not less the 8 years for 4 changes per day and it should have Button Battery Meeting Name Plate Device display size should be Minimum 10.2" diagonally or more Meeting Name Plate Device Display color should be available in : B/W , B/W/R Operating temperature : 0-40°C Resolution(pixel) : 800x528 Product size (mm) : 181.2"x124.1 along with 1 no of Core Distribution device Shall have Minimum 2.4GHz private protocol Network Interface - RJ 45 Network Protocol - TCP/IP, HTTP, DHCP PoE Power Supply Transmitting Power - 0dBm-23dB automatically Antenna- antenna Two ports omnidirectional antenna Coverage Radius - Not Less then 15 Mtr System Should Work on network via web interface without installing any software from any remote or central location. Can access it using mobile or a tablet also Divide screen the way to as many regions as required & populate images, Name and designation of the meeting participant Image Formats: jpg, bmp Static Text Can be shown on the Meeting Participant Device and it can be use a welcome message Can show the Meeting Participant Name on each device and there should be provision to bind the Participant Name with the Device from anywhere from the network Search for all valid/invalid Name information, Add, delete, modify valid store information, restore invalid Name, and conduct fuzzy query for name and according to Search and view all user information within the authority, add and delete user information (users cannot delete themselves), modify user information, and reset user password Search and view all Meeting Participant information, add, delete and modify Meeting Participant information. Import or update the Meeting Participant information in batches according to the condition. Search and view all Meeting Participant Plate information, delete and modify the information; Replace base station information of the Device View all base station information, import, delete, and modify Base station information. View unassigned Base station information and build time. View Base Station MAC address update and build time. The administrator can see the general task information of the current store and its sub-stores. Search and view all template information of non-breaking screen, upload, delete, modify template information. Search for all tag types information. Search and view all database configuration information, add database configuration information. Template Manager to Make the new Template, Add/delete/modify the template designer to add the color theme, layout design for the templates Tag Management to add/ delete/ modify the tags Update of the device information from the Web application & View the History of Tag Update System Should be Supplied with Required CMS Software with 15 Year License. he specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation	1.000			NO	One Number	
201	Supply, Installation, Testing and commissioning (SITC) of 21.5" Smart Frame shall have minimum A133 Quad-Core ARM Cortex-A53 processor, operating at a minimum clock speed of 1.7 GHz, or better, ensuring robust performance. The integrated memory shall be a minimum of 1GB, or higher, for efficient multitasking. The system storage capacity must be a minimum of 32GB, or greater, to accommodate essential applications and data. The display unit shall feature a minimum LCD size of 21.5 inches, or larger, with a resolution that must meet a minimum of 1920 x 1080 pixels IPS panel technology, or superior, to provide exceptional visual clarity and wide viewing angles. The aspect ratio of the display shall be maintained at a minimum of 16:9, or better, ensuring optimal compatibility with multimedia applications. The panel technology must be a minimum IPS LCD type, or better, guaranteeing superior color reproduction and consistent brightness. The system shall operate on Android 7.1 as the minimum operating system, ensuring compatibility with modern software applications. USB connectivity must include a minimum of USB 2.0 and Micro USB ports, providing versatile connection options for external devices. Additionally, the system must support a minimum of TF memory cards with a capacity of up to 64GB, ensuring expandable storage options. For network connectivity, the device shall feature a minimum of dual-band WiFi supporting 2.4GHz and 5GHz frequencies, or superior, ensuring high-speed internet access. Integrated speakers must deliver a minimum of 2X2W output with an impedance of 8Ω, or better, to provide clear audio playback. Furthermore, Bluetooth functionality shall be a mandatory minimum feature, enabling wireless device connectivity. The system shall support a minimum language selection of English and multiple other languages, ensuring user adaptability and inclusiveness. All parameters listed above represent the baseline requirements for the tender, and products meeting or exceeding these specifications shall be given preference . The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is not considered for installation End	35.000			NO	One Number	
PART-17: IPPBX							
202	Supply, Installation, Testing, and Commissioning (SITC) of IP-PBX system must be supplied by an Original Equipment Manufacturer (OEM) certified with ISO 9001:2015 and ISO/IEC 27001:2013. The system will include Gateways, Digital Phones, IP Phones, Meeting Manager/Collaboration Bridge, Softphone, and UC Client, all sourced from the same OEM. A valid service and spare support availability of a minimum of five years is required. IP-PBX will have a minimum capacity of 100 IP, Analog, or Digital Telephone lines and be expandable to accommodate up to 10,000 telephone lines. It will be installed in the Server Room of the COE Building, with the PRI lines firebox terminated in a separate rack located within the server room. This rack will be connected to the IP-PBX system proposed system must support automatic route selection (ARS) and least cost routing (LCR) features, enabling call routing based on user profile priorities, tariff considerations, and network availability, ensuring the most cost-effective path for all calls. This service will be transparent for users and independent of the physical location of the users The telephony system is to be designed with IP as the core of the communications system, allowing for fully distributed IP solutions across data networks. It should be call server-based and capable of supporting traditional TDM, mixed IP-TDM, or a fully 100% IP configuration. All telephony applications, gateways, endpoints, and telephony systems must originate from the same OEM Node matrix as per project needs. The Engineering, Procurement, and Construction Contractor will prepare and submit this design for approval before commencing any work. Refer to the following technical specifications: <b>Auto Redial</b> Callers who get a busy signal will be alerted if the line they are calling becomes available during a specified period of time. You only need to pick up the phone to be connected to the number you were trying to reach. <b>Call Paging</b> Call paging allows you to dial into the overhead or external speakers of telephones in order to make voice announcements. We can do multicast paging groups and store and forward paging. <b>Park and Page</b> Park and Page to automatically receive a call, park it on a free group park extension and page a paging group. Ideal for retail stores. <b>Parent/Child Extension configuration</b> Parent/Child Extension configuration allows the creation of child extensions tied to a parent. Regarding the inbound/outbound calls the groups of parent/child extensions work as one extension on multiple devices. Child extensions do not use an IP line on the PBX. Ideal to use Phone Book Phone Book provides users with the ability to scroll through a company's Global Contact Directory on the phone and dial the desired extension easily. <b>Intercom</b> Intercom allows for room-to-room communication via telephone sets with auto-answer on the called telephone. <b>Speed Dial</b> Speed Dial gives you the ability to "save" frequently called numbers so that they can be easily dialed on your extension with an assigned shortcut of digits. <b>Global Speed Dial Directory</b> Global Speed Dial Directory in addition to personal speed dialling codes for individual extensions, supports speed dialling codes shared between all extensions on the PBX. <b>Alarm</b> This feature allows setting an alarm call one time only or repeatedly for the desired days in a week. The alarm call will be activated automatically by the pre-configured date/time with a precision of up to seconds. You can use your own alarm message, by uploading it as a file or Dial & Announce Dial & Announce supports calls simultaneously to the predefined list of destinations. When answering the call, the uploaded as a file or recorded from the phone audio message will be played to the receiver. The Dial & Announce calls can be activated automatically by schedule or triggered by a call to the extension which is configured with Dial & Announce service. <b>Emergency Interrupt</b> Emergency Interrupt is used to interrupt the active calls and connect directly to called party in case of an emergency. <b>Authorized Phones</b>	1.000			NO	One Number	



The Authorized Phones service is used to define the list of trusted external users, allows accessing the auto-attendant Call Relay menu automatically by recognizing the originators' Caller ID. When adding an authorized phone number to the list, select a Server extension for login. Calling the auto attendant, the trusted users' Caller ID will be recognized and the caller will automatically be logged in to the Call Relay menu. The Caller ID will be associated with the extension in the Login Extension field and as such the caller will bypass the usual prompt to Callback on Auto Attendant.

Authorized callers can initiate Callback by dialling the Auto Attendant and hanging up the call during the specified time out, without waiting for the Auto Attendant prompt. Server will call back to the authorized phone number and play the Auto Attendant prompts when answered. At this point, all Auto Attendant services, like connection menu, Remote Access Menu, Call Relay Menu are available to the authorized caller. This allows authorized callers to save calling charges when using the Call Relay or other Auto Attendant services on the Server.

**Click To Call Chrome extension**  
Click To Call Chrome extension is used for making one-click calls via Server to phone numbers shown on the web pages. The Chrome extension detects the phone numbers on the web page and as soon as the user hovers over one of them, a callout pops up with the detected phone WebRTC Click2Call.

WebRTC Click2Call feature is available on the Server3000, Server5000 and eServer. Is used to make WebRTC calls from a web browser having WebRTC support to Server extensions or to destinations, which are external to Server.

**Customizing the System Voice Messages**  
The system voice messages can be customized either for the selected extensions (user and auto-attendant extensions) or for all user extensions on Server at once. The following methods are available for customizing the system voice messages on Server: upload an earlier recorded file in the appropriate WEB configuration page, record a new voice message on the phone by using the appropriate option in the Voice Mail Service (VMS), or record a new voice message on the IP phone by using the Record from Extension service available for extensions.

**Receptionist Phone Configuration Wizard**  
The Receptionist Phone Configuration Wizard allows configuring a new receptionist. Applicable to most of the Epygi supported IP phones.

**Scheduling**  
Scheduling feature allows controlling the call routing rules and auto attendant scenarios automatically based on the preconfigured weekly schedules of working/non-working hours.

**Hot Desking**  
Hot Desking is ideal for an office with multiple workers using a single physical phone at different time frames to log in to the handset and use it as their own extension.

**Hold Music**  
Hold Music ("WAV" and "MP3" Files Upload) allows callers to hear music or a recorded message while on hold or waiting for other participants to arrive on a conference call.

**IP Phones Logo**  
IP Phones Logo is used to upload a custom logo for the IP phones. The uploaded custom logo will be visible on the display of the IP phone.

**Call Blocking**  
This prevents calls from specific numbers from getting through, enabling you to avoid unwanted Direct Transfer to a Voice Mailbox.

This enables callers to be directly transferred to another extension's voicemail.

**Distinctive Ringing**  
This lets you customize ring tones for identified callers and categorize calls to specific lines (service, sales, or billing).

**Do Not Disturb**  
Redirects all incoming calls to your voicemail through the PBX, ensuring your phone won't ring during the specified timeout.

**Hiding Caller ID**  
Blocks your phone number from being identified by the call's recipient.

**Auto Attendant with Standard and Customizable Scenarios**  
This Interactive Voice Response (IVR) system replaces a human operator and directs calls to the appropriate extensions or voice mailboxes. It engages callers through pre-recorded or synthesized audio prompts.

**Call History for the Auto Attendant Custom Scenario**  
Input choices configured within auto attendant custom scenarios, selected by external callers as they navigate these scenarios, are recorded and stored as historical data. This information can be retrieved, processed, exported as XML files, and analysed. This analysis helps evaluate the effectiveness of the pre-configured custom scenarios, allowing for informed decisions and Call Hunting.

This ensures that incoming calls are directed to multiple extensions in sequence, enabling the call to be answered promptly by the first available person.

**Simultaneous Ring**  
This feature allows incoming calls to ring simultaneously with several extensions so that the first available person can answer the call.

**Call Pickup**  
This allows you to define pickup groups by grouping extensions. Any phone in the building can answer a call ringing on another extension within the designated pickup group.

**Call Queue**  
This feature enables incoming callers to be placed in a queue where they can listen to a personalized recorded message. If unanswered within the specified timeframe, the caller can be directed to voicemail or redirected to another extension, ensuring efficient call management.

**Extension Status**  
This allows a receptionist's phone to monitor multiple managers' phones and provide information on the extension's status – off-hook, on-hook, or ringing.

**Hot Desking**  
Hot Desking is perfect for offices with multiple employees who use a shared physical phone at different times. It allows them to log in to the handset and use it as their personalized extension, enhancing flexibility and workspace efficiency.

**Multi-Company Receptionist**  
Enables one receptionist to handle calls from designated numbers, each associated with a specific company. This efficient setup not only saves time but also optimizes your budget.

**Emergency Interrupt**  
Emergency Interrupt enables the immediate interruption of active calls, establishing a direct connection to the called extension in emergency situations.

**Call Alert**  
Call Alert is used to notify the designated personnel about the emergency calls, as well as calls through certain call routing rules. The following information will be included in the notification: the routing pattern, the extension who placed the call, the dialled number and the call Date/Time. The notifications can be generated and displayed in the System Events, sent via E-mail, via SMS, or left as voice mail on the defined extension(s) with a voice message.

**Call History**  
Call History gives you the ability to track and report call details (caller, call recipient, length of call, call cost, call quality etc.) on incoming and outgoing calls per extension.

**Dial Plans**  
Dial Plans (Call Routing) allows calls to travel through a network along a pre-determined path to the end-user. This feature helps determine the least expensive way and/or least congested path to route a call. Incoming calls can also be grouped according to area code and routed to specific customer service reps who manage different geographic regions.

**Class of Service**  
Class of Service can be used to define the permissions that PBX extensions will have when using certain call routing rules to make calls. An extension will only be allowed to use the call routing rules that have a matching Class of Service designation.

**Date/Time Settings**  
Date/Time Settings in the call routing table allowing to secure Call Routing rules by limiting their availability for a certain time frame. When the caller attempts to use the specific Call Routing rule outside of the configured time frame, he/she will be denied access.

**Time of Day Dialling**  
Time of Day Dialling makes it possible for calls to be routed according to the time of day. This enables you to pre-select where a call will be directed in regard to time.

**PIN Barring**

PIN Barring feature allows to assign and manage credits on the PIN codes configured in the Server Local AAA table. The assigned credits will be spent if the authentication by PIN option is used when making calls through call routing rules with Call Rate Settings enabled. PIN codes, which have no credits assigned cannot use the routing rules with Call Rate Settings enabled. Similar to the case where the calling credits are assigned to the Server extensions, the PIN barring feature calculates the call cost per minute and per second. Once the available credits assigned to the PIN are completely spent, placing new calls through the toll routing rules will not be possible until the available credit balance is updated, either manually or automatically. For user convenience the automatic credit balance update for PIN codes can be scheduled daily.

**Overall Call Duration Limit**  
You may also secure Call Routing rules by putting a limit on the overall call duration for selected Call Routing rules. The duration limit can be set to limit the total duration for all calls for a specified time, such as daily.

**Hot Desking**  
Allows an office with multiple workers using a single physical phone at different time frames to log in to the handset and use it as their own extension.

**RTP Streaming Channel**  
This feature allows on-hold party to listen to music streamed by the Epygi Media Streamer, which has the ability to play MP3 files instead of the pre-recorded voice stored on your Server. This feature Should have ability to play different streams for each extension, to play very long audio files and allows the playlist selection to be easily changed.

**Hold Music** (\*.WAV\* and \*.MP3\* Files Upload)  
The Hold Music feature allows callers to hear music or a recorded message while on hold or waiting for other participants to arrive on a conference call.

**T.38 Fax, Fax Relay and Clear Channel Fax**  
The T.38 fax relay standard permits faxes to be transported across IP networks between existing fax terminals. A clear channel gives full use of the bandwidth for this purpose.

**The Hot Call** Add-in application works with Microsoft Outlook allowing incoming and outgoing calls to be made within the native Outlook interface.

**Hotkey Call** is a Microsoft Windows software application, which allows PC users to dial telephone numbers directly from their desktop on any application window (e.g. web-browsers, e-mail client, text documents, etc.). This can be done by simply highlighting the number you wish to dial and pressing a predefined hotkey sequence (e.g. Ctrl-Y).

**System Security Software**  
The System Security Software feature protects your IP PBX against external hackers, who could have the ability to reconfigure your system through eavesdropping, Denial of Service (DoS) or Theft of Service (ToS). Not only does the software prevent the above through internal protections, but each line also has the ability to be password protected through the security Firewall

**Firewall** is a security service configurable through various criteria. It has three levels of security policies: low, medium and high. The Firewall allows or blocks traffic based on the policies, services and/or IP addresses. Filtering rules will take effect only if the Firewall has been enabled and are independent of the selected firewall security level. Additional service-based rules can be System Security Diagnostics

**System Security Diagnostics** allows running the security audit and getting the security reports. The Security Audit generates warnings regarding the system's weaknesses. The warnings may vary depending on the selected global Security Level. The Security Audit will detect security-related configuration issues in the Firewall, IDS, IP Line passwords, Call Routing and extension SIP IDS

**SIP IDS** allowing to prevent the SIP attacks.

**Securing Calls on Auto Attendant**  
The auto-attendant has a digit-parsing feature that can be enabled/disabled. This option can provide a lot of flexibility and dialing options for customers but it should be used with care. When the digit-parsing feature is enabled, all digits dialed by the caller while listening to the auto-attendant prompt will be sent directly to the Call Routing table to resolve the intended destination. With this option enabled the entries in the Call Routing table need to be properly User Rights Management

**User rights management** is useful to the Server administrator in order to set the restrictions for certain PBX users to manage the Server configuration. It allows to set restrictions on the GUI access for various PBX users, permits or denies access to certain Web GUI configuration Class of Service

**Class of Service** can be used to define the permissions that PBX extensions will have when using certain call routing rules to make calls. An extension will only be allowed to use the call routing rules that have a matching Class of Service designation.

**Date/Time Settings**  
Date/Time Settings in the call routing table allowing to secure Call Routing rules by limiting their availability for a certain time frame. When the caller attempts to use the specific Call Routing rule outside of the configured time frame, he/she will be denied access.

**Call Alert**  
The Call Alert feature is designed to inform specific personnel about emergency calls and calls routed through specific call routing rules. The notification includes essential details such as the routing pattern, the calling extension, the dialed number, and the call date/time. These notifications can be generated and viewed in the System Events, sent via email or SMS, or left as a voice message on predefined extension(s) along with a recorded message.

**Securing Call Routing**  
The Local AAA Table serves as the hub for configuring and managing the local authentication database. When the Local Authentication option is enabled on the routing pattern, the caller needs to pass authorization. This can occur automatically through trusted caller ID detection, manually by entering specific login details (username and password), or by using a handset PIN code. Additionally, you have the flexibility to set an expiration period for the authentication process. Once successfully authenticated, the caller gains access to utilize the designated call PIN Barring

The PIN barring feature enables the assignment and management of credits for PIN codes, which are used when the authentication by PIN option is used for calls made through call routing rules with enabled Call Rate Settings. PIN codes without assigned credits cannot use routing rules with Call Rate Settings enabled.

Similar to the method used for Server extensions, the PIN barring feature calculates call costs per minute and second. Once the assigned credits are exhausted, new calls through toll routing rules become impossible until the credit balance is updated manually or automatically. Users can opt for convenient automatic credit balance updates daily, weekly, or monthly.

**Overall Call Duration Limit**  
The Overall Call Duration Limit may secure the Call Routing rules by putting a limit on the overall call duration for selected Call Routing rules. The duration limit can be set to limit the total duration for all calls for a specified time, such as daily.

**Call Relay**  
Call Relay allows an external call to be relayed through your IP PBX box to an external line or Call Forwarding

This allows you to program your PBX extension to redirect incoming calls to another number automatically

**Find Me Follow Me**  
This feature permits employees to have calls track them down wherever they are.

**SMS**  
This allows you to receive notice of "events" (calls, voice mails, etc.) from the PBX to your mobile phone as a text message.

**Voicemail service**  
The Voice Mailbox and Voice Mail Settings are readily available to all user extensions on the IP PBX by default. This Voicemail service enables the reception and storage of voice messages directly in the extension's mailbox. It includes features like new voicemail indications, notifications, and redirection options. Additionally, users can enable or disable the Voicemail service through their extension's admin settings.

**Surveillance**  
IP PBX seamlessly integrates with your voice, video, and surveillance products, offering a unified solution for your business needs. With this surveillance feature, you receive real-time security updates 24/7 via email, cell phones, and more, ensuring a safe environment for your employees and business visitors.

**Unified Messaging**  
Unified Messaging integrates different message types – voicemail, email, text messaging, fax – into a single mailbox that is accessible from a variety of devices, including your office phone, PC, and cell phone.

Call Answering Automatic or manual call answering options.

	<p>Call Management Features like call forwarding, call transfer, call hold, and call waiting.</p> <p>Call Screening Ability to identify and manage incoming calls based on caller ID or other criteria.</p> <p>Group Convenience Features for managing calls within a group, such as group call forwarding and group hold.</p> <p>Cost &amp; Bandwidth Saving Optimization features to reduce call costs and bandwidth usage.</p> <p>RTP Streaming Channels Support for real-time transport protocol (RTP) streaming for audio and video calls.</p> <p>Utility Additional tools and features to enhance the user experience, such as call recording, call history, and voicemail.</p> <p>Hot Call Add-In for Microsoft Outlook Integration with Microsoft Outlook for seamless call management and communication.</p> <p>Hotkey Call Ability to initiate calls using keyboard shortcuts.</p> <p>Tools for Securing your Device Security features to protect the device and user data, such as password protection, encryption, and malware protection.</p> <p>Unified Communications Integration of various communication channels, such as voice, video, messaging, and collaboration tools, into a single platform. 1</p> <p>Auto Attendant Standard, customizable scenarios, call history</p> <p>Call Management Blocking, forwarding, hold, transfer, relay, waiting</p> <p>Voicemail System, SMS/email notification, caller ID-based profile</p> <p>Call Park/Pickup Call park, pickup, multicast paging, intercom</p> <p>Speed Dial Distinctive ringing, speed dial, many extension ringing</p> <p>Call Hunting Call hunting, receptionist, call park with paging</p> <p>Emergency Emergency call alert, hold music, call history archiving</p> <p>Unified Messaging Voicemail transcription, CRM integration</p> <p>Conferencing</p> <p>Fax Support G3 fax support, T.38 and clear channel fax</p> <p>Security Local authentication, PIN code barring, call encryption</p> <p>Productivity Call queue, hot desking, parent-child extension config</p> <p>Advanced Features Automatic call distribution, call recording, barge-in</p> <p>Voice Coding G.711, G.726 (16, 24, 32, 40 Kbps), G.729A, iLBC (13.33 kbit/s, 15.2 kbit/s), VAD, CNV, G.722, G.722.1, OPUS</p> <p>Video Coding H.263, H.263+, H.264</p> <p>VoIP Encryption SRTP</p> <p>VoIP Signalling SIP v2, SIP/TLS</p> <p>DTMF In-band and out-of-band signalling support</p> <p>VoIP Data and Signalling Protocols ITU-T G.711, G.726, G.729 Annex A, IETF RFC 3951- iLBC, SIP, SIP/TLS/RFCs: 2246, 3261, 3263, 3265, 3311, 3323, 3428, 3515, 3578, 3581, 3842, 3856, 3863, 3891, 3892, 4028, 4235)</p> <p>SDP RFC: 2327, 4568</p> <p>RTP/SRTP RFCs: 1889, 1890, 3389, 3550, 3551, 3555, 3711, 4733, 3952</p> <p>Fax over IP ITU-T T.4, T.30, T.38, V.17, V.21, V.27 ter, V.29</p> <p>Physical Interfaces 2 Ethernet 10/100/1000 BASE T (RJ45)</p> <p>IP Phones 500 IP phones by default, up to 4,500 additional IP phones with feature keys</p> <p>IP Phone Connectivity LAN side or remote extensions, auto provisioning, PnP configuration, OpenVPN auto configuration</p> <p>Auto Attendants Up to 5,000 Auto Attendants can be added</p> <p>Virtual Extensions Up to 5,000 virtual extensions can be added</p> <p>System Capacity Up to 700 simultaneous VoIP calls with external parties, unlimited station-to-station calling for IP phones</p> <p>Emergency Repair Boot-up Device: DVD-ROM</p> <p>NAT Traversal STUN/NAT traversal (RFC 3489)</p> <p>Firewall Security Policy and service-based filtering, stateful inspection firewall, IDS/IPS</p> <p>LAN Services DHCP server, DNS server with forwarding functionality</p> <p>Time Synchronization Simple Network Time Protocol (SNTP) server/client</p> <p>QoS IP DIFFSERV</p> <p>SIP Tunneling Supported</p> <p>Virtual LAN VLAN/IEEE 802.1Q</p> <p>Mail Client Send voice and fax messages as email attachments (.wav and .tiff/pdf) and system notifications</p> <p>DNS Support DYNDNS support with third party</p>						
203	<p>Supply, Installation, Testing, and Commissioning (SITC) of system shall be equipped with a minimum of 720p@30 FPS HD video calling capability or better, utilizing a minimum of H.264 High Profile, H.264, and VP8 codecs or better, and shall incorporate a minimum 2-megapixel, plug-and-play camera that shall be adjustable and include a privacy shutter and LED indicator or better. The camera's field of view shall be a minimum of 70.2° or better, and it must support self view functionality. Audio performance must include a minimum of high-definition voice quality or better, with an HD handset and HD speaker, along with a Hearing Aid Compatible (HAC) handset. The speakerphone shall be a full-duplex, hands-free design with minimum AEC functionality or better. The system shall accommodate a minimum of 16 VoIP accounts or better and shall support advanced telephony features including, but not limited to, call hold, call forward, call waiting, call transfer, one-touch speed dial, hotline capabilities, group listening, emergency calling, redial, call return, and auto-answer. It must enable direct IP calls without SIP proxy and provide support for ringtone selection, import, and deletion. Advanced conferencing functionalities shall include a minimum of three-party video and five-party mixed audio/video conferencing or better. The device must support the import and export of data via Bluetooth and email for seamless integration or better. IP-PBX functionalities must include a minimum of Busy Lamp Field (BLF), Bridged Line Appearance (BLA), remote office functionality, hot desking, intercom, paging, message waiting indicators, voicemail, call park, call pickup, and music on hold or better. It shall provide a minimum of advanced call recording capabilities, call completion features, and robust anonymous call rejection functionalities or better. The directory shall be capable of storing a minimum of 1,000 local entries and 5,000 server entries or better, offering blacklist capabilities, XML/LDAP remote directory access, and smart dialing features. It shall include standard search, broadcast, and nonbroadcast and history base number dial.</p> <p>The system's interface shall include a minimum of dual-port Gigabit Ethernet, built-in Wi-Fi operating at a minimum of 2.4GHz with 802.11b/g/n standards or better, and Bluetooth 4.0+ EDR for headset pairing and mobile device connectivity or better. It shall include a minimum of two USB 2.0 ports for connecting peripherals such as a 2 MP camera and USB flash drives or better, a minimum of one security lock port or better, and a minimum of one RJ9 (4P4C) handset port or better. Management features must include a minimum of browser, phone, or auto-provisioning configuration capabilities or better. Auto-provisioning shall be supported via FTP, TFTP, HTTP, and HTTPS for mass deployment, with minimum PnP, zero-up-touch, and TR-069 functionality or better. The system must include minimum phone lock capabilities for privacy protection, factory reset, and reboot functionality, as well as system logs and package tracing export. Administrative access must restrict app installation or uninstallation through auto-provisioning, and the device shall incorporate a setup assistant wizard to simplify configuration. The device must include a minimum of 27 one-touch DSS keys and eight feature keys for critical functionalities such as hold, transfer, messaging, headset, mute, redial, speakerphone, and volume control or better. All feature keys must be equipped with illuminated indicators. Furthermore, the system shall integrate with Android-based applications, supporting a minimum of file management, email, calendar, camera, gallery, recorder, calculator, browser,</p>	1.000			NO	One Number	

204	Supply, Installation, Testing, and Commissioning (SITC) of The audio capabilities of the device shall include a minimum support for the codecs G.722, G.711 (Aµ), G.729, and G.723 or better, alongside DTMF signaling via both in-band and out-of-band (RFC 2833) protocols, as well as SIP INFO or better. The audio subsystem shall incorporate a full-duplex hands-free speakerphone with a minimum of advanced features including AEC (Acoustic Echo Cancellation), VAD (Voice Activity Detection), CNG (Comfort Noise Generation), AUB (Adaptive Jitter Buffer), and AGC (Automatic Gain Control) or better to ensure superior audio performance. The phone functionalities shall include a minimum of abbreviated dialing, call pick-up, internal call restrictions, call hold, mute, and Do Not Disturb (DND) or better. It shall support one-touch transfer, hotline capabilities, redial, Auto Call Back (ACB), auto-answer, call forward, call waiting, and call transfer. Additionally, the device must include a minimum of 3-way conferencing and multi-party conferencing, emergency call capabilities, and advanced conferencing options or better. The display shall feature a minimum resolution of 128 x 64 graphical LCD or better, with LED indicators for calls and message waiting notifications. The interface shall be intuitive and include icon-based navigation to enhance user experience or better. Networking and security capabilities shall utilize an extended (proprietary) SIP protocol or better, with IP assignment supported via static configuration and DHCP. Security measures must include SRTP and TLS for secure communications, and QoS shall be supported with a minimum of 802.1p/Q tagging (VLAN) or better to ensure optimal performance in network environments. Installation options must include a desk mount configuration, with environmental performance parameters accommodating a minimum operating temperature range of 0°C to 45°C or better and a humidity tolerance of 10-95% (non-condensing) or better. The device shall comply with certification requirements such as CE FCC IEC I/O (Data ID) and BTL to ensure compliance.	30.000			NO	One Number	
205	Supply, Installation, Testing, and Commissioning (SITC) of desk phone shall provide a comprehensive suite of features, including but not limited to minimum capabilities for call hold, mute, Do Not Disturb (DND), speed dial, hotline functionality, redial, call back, auto-answer, call forward, call waiting, and call transfer or better. It shall support room monitoring, conferencing, directory access, call logs, paging, and display-name functionality, ensuring versatile communication management or better. Call management features shall include a minimum of message wait lamp, ringer lamp, and voicemail notification capabilities or better. The phone must allow for group and selective call pickup, as well as advanced paging functionalities to facilitate effective communication in diverse environments or better. The display shall feature a minimum resolution of 240 x 64 pixels graphical LCD with backlight functionality or better, providing indicators for incoming and ongoing calls, mute, and hold statuses. The interface shall be intuitive, icon-based, and support multiple languages for enhanced usability. Caller ID must display a minimum of the name and number or better to support identification. Physical features shall include a minimum of 49 keys, comprising at least four context-sensitive keys, one RJ9 handset port, and one RJ9 headset port or better. Mechanically, the phone shall have a minimum weight of 0.805 kg or better, and installation options shall include both wall-mount and tabletop configurations. The device shall feature a black color finish, ensuring suitability for professional environments or better. Environmental specifications shall include an operating temperature range of a minimum of 0°C to 45°C or better, and storage temperature ranging from 0°C to 55°C or better. It must support operating and storage humidity levels from a minimum of 5% to 95% RH, non-condensing or better. The device shall support SNMP versions v1 and v2g for advanced network management capabilities or better. The device shall meet or exceed international certification requirements, including but not limited to CE FCC IEC and BTL, ensuring compliance.	1.000			NO	One Number	
206	Supply, Installation, Testing, and Commissioning (SITC) of Analogue Phone	10.000			NO	One Number	
<b>PART-18: IBMS</b>							
207	Supply installation testing and commissioning of the following window based graphical software for IBMS system with 2 Nos Client for Operator workstation. 15000 hard/soft I/Os to be considered and shall have provision of future expansion. The following software packages shall have below minimum features and compliances. a) 3D & HD vector dynamic graphics with Autocad import of plan with Zoom In & Zoom Out b) Native 64 Bit System , BTL,UL,EN Certified System, BACnet Profile B-AWS (Advanced workstation) as per the BTL Listing c) Multi-Monitor Support-( Min 4 Nos), Multi-language support,Object tracking on multiple d) Certified OPC DA Server by OPC Foundation e) HTML5 based Web-Server software shall permit use of Standard Web-Browsers such as Microsoft Edge, Google Chrome, Mozilla Firefox, etc. f) The Software shall comply to international standards and strive to deliver products that meet security standards such as ISA/IEC 62443, UL2900, ISO/IEC 27001, ISO/IEC62443 and g) Cybersecurity SL2, Seamless integration of Security certificates within customer IT infrastructure, Microsoft's active directory-based authentication, LDAP integration, Use of network infrastructure that supports physical network or VLAN segmentation, End-to-end encryption from client to server, End-to- end encryption between servers, Certificate-based data exchange, Encrypted backups h) Audit Trail , 4-Eye Principle, Data Point Validation, Verified tempering evidence for report transmission i) The software shall integrate with BIM data seamlessly j) Ability to provide data to other systems thru OPC DA Server and / Or Rest web services k) Reports - Customized reports for Trends and alarm with Graphic screen shots. l) Seamless integration of Fire alarm system should be there. m) Alarm Escalation: Assisted treatment of alarms which helps in Predefined & fast intervention steps for faster response n) Energy dashboards having cockpit view of total energy utilized. Energy and Power reports.	1.000			NO	One Number	
208	The contractor is required to provide and operate an Automated 360° Photo Documentation System throughout the construction phase for a minimum duration of 24 months from the date of deployment. This system is essential for ensuring comprehensive and detailed documentation of the site activities, enabling transparent communication and efficient monitoring of construction progress. Designed to operate as an advanced digital solution, the system will ensure remote accessibility for all authorized users, allowing them to review site images and related data conveniently. The Automated 360° Photo Documentation System is tasked with capturing high-resolution 360° imagery of the construction site, providing a holistic view of the site's ongoing activities. This feature is instrumental in enhancing accountability and tracking the project's progress with precision. The captured images must facilitate the attachment of notes, allowing stakeholders to annotate directly on the visual records for the identification and resolution of issues. This functionality ensures that critical observations are documented systematically and are easily accessible for review by all relevant parties. Additionally, the system must generate detailed and comprehensive PDF reports that consolidate all observations, making it easier to communicate findings and updates in an organized manner. These reports will serve as vital references for stakeholders and project managers, providing a clear snapshot of site conditions at any given time. The Automated 360° Photo Documentation System is tasked with capturing high-resolution 360° imagery of the construction site, providing a holistic view of the site's ongoing activities. This feature is instrumental in enhancing accountability and tracking the project's progress with precision. The captured images must facilitate the attachment of notes. Reports will serve as vital references for stakeholders and project managers, providing a clear snapshot of site conditions at any given time. The system must also support date-based viewing and image comparison capabilities, providing stakeholders with tools to monitor the progress of construction activities over time. This feature is particularly useful for tracking changes on the site and ensuring that the project adheres to its planned schedule and milestones. By enabling side-by-side comparisons of images captured on different dates, the system allows project managers to identify discrepancies, assess completed work, and make informed decisions on the necessary corrective actions. This historical documentation of the construction process not only helps in resolving on-site issues but also provides valuable records for post-project analysis and reporting. A critical requirement for the contractor is the commitment to upload weekly site scans, ensuring that the system remains consistently updated with the latest visual data from the construction site. These weekly updates ensure that all stakeholders have access to up-to-date information, which is crucial for maintaining transparency and accountability. This consistent flow of data allows project managers to stay informed about on-site progress without the need for frequent physical site visits, reducing logistical challenges and improving overall efficiency. Moreover, the ability to review current site conditions remotely makes it possible for project teams to identify and address potential issues proactively, minimizing delays and mitigating risks	200.000			NO	One Number	

	<p>The Automated 360° Photo Documentation System is expected to operate as a standalone solution with minimal disruption to the ongoing construction activities. Its design must be robust and user-friendly, allowing contractors and stakeholders to integrate the system into their workflows seamlessly. The system must support remote access capabilities, enabling stakeholders to log in from any location to view site images, annotate observations, and review reports. This remote accessibility ensures that all authorized users remain connected to the construction process, regardless of their physical location, promoting collaborative decision-making and effective communication across the project team. In addition to its functional capabilities, the system must demonstrate reliability and durability in capturing and processing large volumes of data over the specified 24-month period. It must be capable of operating in challenging construction site environments, handling variations in weather, lighting, and other on-site conditions. The hardware and software components of the system must be designed to withstand the rigors of the construction process while maintaining high performance and accuracy in data capture. The contractor must ensure regular maintenance and updates to the system.</p> <p>Weekly site scans serve as a crucial component of the system, ensuring that the visual data remains current and reflective of the site's actual conditions. These scans provide a reliable source of information for stakeholders, allowing them to monitor progress, identify deviations, and implement corrective measures in a timely manner. The regular updates also ensure that all observations and reports are based on the latest site data, enhancing the accuracy and reliability of the documentation process. End ....</p>					
209	<p>supply installation testing and commissioning of True IP Based DDC Standalone 32 Bit Intelligent, peer to peer communication, interoperable DDC as per the specification. The compact controller shall have inbuilt 2-port Ethernet switch . The controller shall have 16 inputs/outputs inbuilt and can be expandable upto minimum 40 points by Input/Output Modules. The DDC shall have 300 Mhz processor with 128 MByte SDRAM (DDR3) and 512 MByte NAND Flash. DDC Controller shall be equipped with a battery-free real-time clock with backup for min 7 days using super capacitor. The controller shall be freely programmable and have System functions (alarms, scheduling, trending, access protection with individually definable user profiles and categories). It should have WLAN interface, Cloud connectivity for remote access and inbuilt port for POT for local interface. Note: Commissioning tool should not be dependent on any license / dongle and no extra cost should be charged. The above shall be housed in vandal proof, lockable &amp; secure MS Cabinets to be supplied along with all necessary switchgear protections as required. Number of</p>					
(A)	Controller for AHU system ( Max 2 AHU in 1 DDC)	1.000			NO	One Number
(B)	Controller for Transformer	1.000			NO	One Number
(C)	Controller for Electrical system -HT/LT System	2.000			NO	One Number
(D)	Controller for Plumbing system-WTP/STP/RO System/Plumbing System	2.000			Lot	One Lot
(E)	Controller for Fire Fighting system	1.000			NO	One Number
(F)	Controller for DG System	1.000			NO	One Number
(G)	Controller for Lift System	1.000			NO	One Number
210	<p>supply installation testing and commissioning of True IP Based BTL &amp; UL Listed for third party integration. The controller shall have 2-port Ethernet switch and WLAN interface. It should have BTL label (BACnet communications passed the BTL test) and consisting of Dual microprocessor with Storage capacity of 1 GByte RAM. It should support Real Time clock with backup of upto 7 Days using super capacitor and also should have option for external battery if required. It should Support of the major communication protocols: BACnet/IP, BACnet MS/TP, Modbus IP and Modbus RTU upto 500 points. Note: 3rd party make</p>	1.000			Lot	One Lot
211	<p>Supplying, installing, testing and commissioning of the following sensors / transducers / transmitters. The DDC shall support sensor with DC 0...20 mA or 4...20 mA, DC 0 ... 10 V, LG-Ni 1000, 2x LG-Ni1000, Pt 1000 , NTC 10k, NTC 100k, 1000 Ohm. All sensors should be UL</p>					

(A)	Immersion temperature sensor 100 mm Pt1000 with Brass Thermowell.	2,000			NO	One Number	
(B)	Outside air temperature + humidity sensors for measuring outside air temperature. It should be provided with sun shield and rain protection.	1,000			NO	One Number	
(C)	Water Flow Switch	2,000			NO	One Number	
(D)	Water pressure sensor	2,000			NO	One Number	
(E)	Differential Pressure Switch Water	8,000			NO	One Number	
(F)	Differential pressure switch for Blower and Filter Status	10,000			NO	One Number	
(G)	Bi Level Switch	12,000			NO	One Number	
(H)	Duct type temperature and RH Sensor	1,000			NO	One Number	
(I)	Differential Pressure Sensor Air	1,000			NO	One Number	
(J)	Space type CO2 sensor	1,000			NO	One Number	
(K)	Water level sensor	8,000			NO	One Number	
(L)	Absolute water pressure sensor	2,000			NO	One Number	
(M)	Flameproof Level Switch	2,000			NO	One Number	
(N)	Current Relay	20,000			NO	One Number	
(O)	Voltage Transducer	2,000			NO	One Number	
212	Supplying, laying, termination, testing and commissioning of signal cables. BMS cable, PVC insulated, Shielded tinned copper conductor cable.	500,000			RMT	One Running Meter	
213	Supplying, laying, termination, testing and commissioning of Communication cables. , PVC insulated, Unshielded twisted copper conductor cable.	500,000			RMT	One Running Meter	
214	Supplying, laying, termination, testing and commissioning of 3 Core BMS power cable , unarmoured ATC conductor multistranded, FRLS cable for Powering DDC, Actuators.	500,000			RMT	One Running Meter	
215	Supplying, laying, termination, testing & commissioning of BMS Network armoured Cables with required accessories like RJ45 connector etc.	500,000			RMT	One Running Meter	
<b>PART-19: PA SYSTEM</b>							
216	Supply, installation, commissioning, and testing of EN54-24 Compliant In Ceiling Speaker	75,000			NO	One Number	
217	Supply, installation, commissioning, and testing of Ceramic Dome From Same OEM For isolate and protect speaker from a building fire. Shall have ceramic terminal connector that withstands high temperatures, and it also has a cable loop that allows to connect to a secondary support in case the speaker's main support gives way in the event of a fire.	75,000			NO	One Number	
218	Supply, installation, commissioning, and testing of Horn Loudspeaker shall be designed to provide exceptional sound clarity and reliability in demanding environments, ensuring high performance with minimal power consumption. The loudspeaker shall feature a high-efficiency rating, designed for public address systems, voice alarm systems, and professional audio installations. It must deliver clear audio with a wide frequency range of at least 490 Hz to 4500 Hz, measured at -10 dB, and an elliptical opening angle at 1 kHz of a minimum 112° horizontally and 85° vertically. The system must operate with a minimum rated impedance of 333 Ohms, and a rated voltage of 100 V. The rated power shall be a minimum of 30 W, with a maximum power capacity of 45 W and pressure level of at least 115 dB/108 dB (1 W, 1 kHz, 1 m) to ensure clear and intelligible audio output in noisy environments. It shall be built to withstand harsh conditions, meeting dust protection standards of IP66 as per IEC 60529, and wind resistance tested to NEM6702:2007 + A1:2008 Bft 11 (static). Climatic tests must conform to IEC 60068-x-xx, ensuring the loudspeaker's durability under temperature and humidity fluctuations. The loudspeaker shall be suitable for both indoor and outdoor use, ensuring	6,000			NO	One Number	
219	Supply, Installation, Testing and commissioning (SITC) of 4 channel amplifier amplifier system shall be designed with a minimum power output capability of 1000W per channel at 4Ω and shall support 8Ω configurations with the same output rating of 1000W per channel, while also being compatible with 70/100V line applications at a minimum of 4x1000W or better. The amplifier shall ensure a THD+N value of less than 0.05% under typical conditions, measured across a frequency range of 20 Hz to 20 kHz with an 8Ω load and 3 dB below the rated power. The signal-to-noise ratio shall be no less than 120 dB (A-weighted), maintaining clarity and precision across the entire frequency spectrum. The frequency response shall span from 20 Hz to 20 kHz with an accuracy of ±0.25 dB or better at rated power and ±0.15 dB at 1 dB below the rated power, with an 8Ω load, ensuring high fidelity. The amplifier shall utilize a Class D output circuitry, incorporating a full-bandwidth PWM modulator for ultra-low distortion. The input impedance shall not be less than 15 kΩ balanced, with a damping factor exceeding 2000 at 8Ω load, 1 kHz, and below, guaranteeing superior control of the connected transducers. The gain and level adjustments shall be configurable, with amplifier gain selectable at minimum sensitivity levels of 0.7V, 1.0V, and 1.44V, and level adjustment for each channel available via front-panel potentiometers. A front-panel power switch shall be provided for operational control. Cooling shall be achieved through fan-based front-to-rear airflow mechanisms, maintaining optimal thermal conditions. The system shall include comprehensive protection circuits such as input limiters, short circuit protection, DC output protection, under/overvoltage protection, SOA (Safe Operating Area) protection, intelligent mains fuse protection, power stage overload protection, and temperature protection for transformers. The power supply system shall be of a universal and regulated switch-mode type, with integrated Power Factor Correction (PFC) and operational voltage compatibility ranging from 90V to 270V AC. The protection systems shall include clip limiting, SOA protection, DC protection, overcurrent detection, thermal safeguards, mains overvoltage detection, and fuse protection mechanisms. Front panel indicators for each channel	1,000			NO	One Number	
	Limit, and Protect status LEDs, with parallel configuration available for Channels 1 & 2 and 3 & 4. Input connectors shall comprise electronically balanced 3-pin XLRs for each channel, and output connectors shall include 4-pin Speakon connectors configured as +1/-1 for CH-1, +2/-2 for CH-2 on one Speakon and +1/-1 for CH-3, +2/-2 for CH-4 on the other. The Digital Signal Processor (DSP) shall operate at a minimum resolution of 32-bit / 96kHz, providing 4 input and 4 output channels with control available via USB. A minimum of 20 presets shall be supported, with each input featuring a 10-band equalizer (PEQ / LS6 / LS12 / HS6 / HS12 / APF), volume adjustment from -60dB to +5dB, and delay capabilities up to 4.99ms. Each output shall also feature a 10-band equalizer (PEQ / LS6 / LS12 / HS6 / HS12 / APF / APF-1), delay adjustment up to 9.99ms, limiting from -19dB to 0dB, and crossover options for HPF and LPF. Input and output linking shall be provided, with inputs linkable as A, B, C, and D and outputs linkable across channels 1 through 4. The specifications outlined indicate the minimum requirements for the design. The bidder is strictly required to adhere to these minimum design specifications. The bidder shall submit the OEM Authorization and Confirmation of Technical Compliances on OEM's official letterhead item and design must be approved by Consultant without approval material is						
220	Supply, Installation, Testing and commissioning (SITC) of Controller operate at a minimum voltage of 230/115VAC, ±15%, 50/60 Hz, with an inrush current not exceeding 8 A and a maximum power consumption of 600 VA or better. It must incorporate a battery power supply functionality rated at 24 VDC, ±15%, capable of sustaining a current load of 14 A to ensure reliability. The system's output power performance shall provide a minimum of 240 W rms and a maximum of 360 W, with a power reduction under backup power of no less than -1 dB. Its frequency response must range from 60 Hz to 18 kHz (+1/-3 dB at -10 dB reference rated output), while maintaining distortion levels of <1% at rated output power, 1 kHz. The system should be equipped with bass and treble control features adjustable by at least -8/+8 dB at 100 Hz and 10 kHz, respectively. A single mic/line input must be included, featuring a connector that supports XLR and 6.3 mm jack. The input sensitivity shall not be less than 1 mV for mic mode and 1 V for line mode, with impedance values exceeding 1 kohm (mic) and 5 kohm (line). Signal-to-noise ratio (S/N) should be greater than 63 dB for mic input and 70 dB for line input at maximum volume, and exceed 75 dB when muted or at minimum volume. The system's loudspeaker outputs must provide floating connectors MSTB 2.5/16-ST with a 100 V output rated at a minimum of 700 W per zone. Volume override types should support 3-wire, 4-wire (24 V), and 4-wire failsafe configurations. Output contacts rated at 100 V, 2 A, voltage-free, must include emergency active relay, call active relay, and fault relay adhering to NQ/COMMC configurations with failsafe normally-closed.	1,000			NO	One Number	

