

<b>ABSTRACT SUMMARY OF MODIFICATION SUPPLY INSTALLATION TESTING &amp; COMMISSIONING OF MEPF WORKS</b>		
<b>SR. NO.</b>	<b>DESCRIPTION</b>	<b>AMOUNT RS.</b>
<b>A</b>	<b>HVAC</b>	
<b>B</b>	<b>ELECTRICAL WORK</b>	
<b>C</b>	<b>PLUMBING HIGH SIDE WORK</b>	
<b>D</b>	<b>PLUMBING LOW SIDE WORK</b>	
<b>E</b>	<b>FFTG</b>	
<b>F</b>	<b>PNG</b>	
<b>TOTAL PROJECT AMOUNT RS.</b>		
<b>NOTES :-</b>		
<b>1</b>	Related all civil works are in civil contractor scope .	
<b>2</b>	All quantities of all SITC work items are to be considered as per scope, information, details as mentioned in <b>Volume I and II</b> while quoting the final rate.	
<b>3</b>	Where there is discrepancy between the rates in figures and in words, whichever is less shall govern. Where there is discrepancy between the unit rate & the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will govern.	
<b>4</b>	If the total amount of bid quoted is less than actual summation of cost of all components or parts as the case may be then the quoted amount shall govern and difference between the actual summation and the amount quoted shall be considered as a discount.	
<b>5</b>	The Agency shall provide/fill up detailed cost break up to the Price Bid (A2,B2,C2,D2,E2) as a separate Annexure in hard copy along with Bid submission.	
<b>6</b>	All duties, custom duties, taxes (including all Central excise tax, Central Govt. & all state Govt. taxes, PF, EPF to employees if any.) and other levies payable by the agency or for any other cause as on the date for submission of bids shall be included in the Rates and Prices submitted by the bidder. No any other taxes shall be paid separately.	
<b>7</b>	Related payment shall be made on the basis of actual work performed as per scope of works which shall be certified by Employer/Engineer-in-Charge/Professional Advisor.	
<b>8</b>	If existing structure/facility/system/any part of Phase 1A, 1B & 2A are damaged during any works. No additional claim will be payable but the Bidder has to complete damaged work in its original state and as per iNDEXTb's instructions.	

Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
A	<b>HVAC WORKS</b>						
1.0	<p><b>PART-01 :- CHILLER</b>  <b>VFD DRIVEN WATERCOOLED CENTRIFUGAL CHILLER:- 550TR x 1Nos (1W)</b>  Supplying, installing, testing and commissioning of CENTRIFUGAL WATER CHILLING UNITS each complete with <b>550 TR</b> actual capacity centrifugal compressor with motor, starter panel free /Unit Mounted standing with VFD( IP54 rated), water cooled condenser, insulated chiller, flow switch at chiller and condenser, vibration isolators, integral refrigerant piping and wiring, BMS interface unit, flanges and counter flanges for condenser and cooler water in/out connections, complete charge of refrigerant and oil, accessories as required and called for, automatic and safety controls mounted in central micro-processor based console panel and all mounted on a steel frame complete as per specifications. Motor shall be suitable for 415±10% 50 cycles. 3 phase AC supply and motor cable terminal box shall be suitable to connect copper Cabling. Refrigerant used shall be Ozone friendly HFC-134a as detailed in specifications. First chiller shall be factory tested at design conditions at 100%, 75%, 50% and 25% load.  <b>Chiller:</b> Chilled Water IN - 53.6°F/ Chilled Water OUT - 42.8°F/Fouling factor - 0.00025 FPS  <b>Condenser:</b> Condenser Water IN - 89.6 °F/ Condenser Water OUT - 96.8°F / Fouling factor - 0.0005 FPS  Maximum Power Consumed : Not greater than 0.58 in kW/TR  Min. COP at AHRI Conditions 6.3  Max. IPLV at AHRI Conditions 9.5 kw/TR  chiller shall unload upto 20 % at constant condenser inlet of 89.6 F without surging and without use of hot gas by pass, Variable orifice system or split ring diffuser shall be adopted  1 No. Suitable capacity squirrel cage IP 54 rated TEWAC (Totally Enclosed Water to Air Circuit Cooled type) or TERC (Totally Enclosed Refrigerant Cooled type) induction motor with class 'F' Insulation suitable for operation on 415+10% volts, 50 HZ, A.C. Supply. (for open type compressor motor H.P. Shall be at least 10% higher than the compressor consumed kW requirement at full load at site design conditions as per AHRI certified design conditions Selection sheet.  1 No. factory fitted Variable Frequency drive free /Unit Mounted standing with VFD suitable for compressor motor complete with ammeter with CTs, overload protection, under voltage protection, protection against phase reversal &amp; independent single phase preventers etc. complete as required. The VFD shall be UL &amp; CE approved. Irrespective to type of VFD cooling method (Air-cooled/Water-cooled/Refrigerant); VFD Protection rating shall be minimum IP54 or higher to safeguard from surrounded environmental conditions.  1 Set- lubrication device consisting of automatic electric oil pump, oil cooler, oil strainer, automatic pressure regulating valve, oil heater, thermal switch etc. as required for the functioning of complete equipment  1 No - matching ASME 'U' / GB stamped shell and tube water cooled condenser of Steel shell and integrally finned copper tubes with 2 pass configuration and max pressure drop up to 3.0 meters. Refrigerant sight glass shall be mandatorily provided in the condenser shell for checking moisture content and refrigerant level.  1 Set - Microprocessor based control panel with minimum 10 inches colored touch screen display complete with accessories. The chiller controller shall be factory wired and unit mounted on the chiller machine. Separate mounting of chiller controller is not acceptable, so that any shifting of the chiller will not necessitate sensor field wiring.  Lot - Refrigerant line accessories comprising of safety valves, angle valves, liquid line indications, liquid level control etc.  Lot- Water Differential Pressure switches at inlet and outlet of condenser and chiller, water drain and air purge valves wherever required.  Lot- Suction line and chiller insulation with minimum 19 mm thick polyvinyl nitrile rubber insulation duly insulated at manufacturer works  Lot - Frame work for mounting the above condenser, chiller compressor and motor with base plate complete with ant vibration neoprene rubber pads or springs isolator  Lot-Factory Charged refrigerant gas and compressor oil.  One unit shall be witness tested on AHRI certified test bed at 100%/75%/50% &amp; 25% capacity at reducing condenser water conditions as per AHRI 550/590 std to verify full load kW/TR-0.65</p>	1	nos.				
1.1	<b>Dismentaling,Lifting &amp; Shifting &amp; commissioning of Existing 1 NOS . 325 TR water cooled screw chiller of CARRIER MAKE with all the piping &amp; valve assembly located at first floor plant room level.</b>	1	nos.				

Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
1.2	<p><b>Chiller Plant Manager</b> Supply, installation, testing &amp; commissioning of Hand Held Module based chiller system manager to control all the equipment's and working mechanism specified. Synchronization shall be achieved for following Equipment's and to enable sequential operation to achieve equal operating time and take care of load patterns and shall be as per specification. All microprocessor should be BTL listed &amp; UL certified. They should be able to work on BACnet/IP protocol.</p> <p><b>EXISTING SYSTEM</b> SCREW CHILLER - 4 W+1 S (325 TR)/ PRIMARY PUMP - 4 W+1 S (750 USGPM)/ SECONDARY PUMP FOR ZONE-I - 3 W+1 S (540 USGPM)/ SECONDARY PUMP FOR ZONE-II - 4 W+1 S (430 USGPM) / CONDENSOR PUMP - 4 W+1 S (1085 USGPM) / COOLING TOWER (2 NOS.) - 2W (900 TR &amp; 300 TR)</p> <p><b>PROPOSED ADDITIONAL SYSTEM</b> CENTRIFUGAL CHILLER - 1 W (550 TR) / PRIMARY PUMP - 1 W (1440 USGPM)/ SECONDARY PUMP FOR ZONE-II - 1W (430 USGPM)/ SECONDARY PUMP FOR ZONE -III - 1W+1 S (1320USGPM)/ CONDENSOR PUMP - 1 W (1870 USGPM)/ COOLING TOWER - 1 W (900 TR)</p>	1	nos.				
1.3	<p><b>Restrained spring vibration isolator of approved make required for following equipment &amp; rating.</b> FOR CHILLER</p>	6	nos.				
1.4	<p><b>SENSORS AND FIELD DEVICES</b> <b>Supply, installation, testing, commissioning of necessary Input sensor transmitters/transducers comprising the following:</b> Immersion temp. sensor</p>	4	nos.				
a	Water Differential Pressure Sensor	4	nos.				
2.0	<p><b>PART-02 :- PUMP</b> <b>Supply, Installation, Testing &amp; Commissioning of End suction back pull out water circulation pump for different water application as under with drive, motor and coupling with following tech specifications :</b> <b>PRIMARY PUMPS</b> Supply, installation, testing and commissioning of End suction back pull out water circulation pump in cast iron body &amp; Bronze impeller, mechanical seals, complete driven with TEFC squirrel cage induction motor with class-F insulation &amp; efficiency class IE3 suitable for operation on 415 + 10% volts, 3 phase, 50 Hz., AC supply, base plate, MS fabricated mounting channel frame, all required fittings &amp; accessories including coupling, coupling guard, vibration isolation arrangement by means of rubber type mounting, foundation nuts, bolts complete as required &amp; as per specification with following capacities. <b>(1 #Working + 1 # stand by)/</b> Water Qty : 1440 USGPM/ Static Head : 15 Mtrs/ Impeller : Bronze/ Speed : 1450 Rpm / Seal : Mechanical/ Efficiency : NLT 80%</p>	2	Nos.				
2.1	<p><b>SECONDARY PUMPS WITH VFD</b> Supply, installation, testing and commissioning of End suction back pull out water circulation pump in cast iron body &amp; Bronze impeller, mechanical seals, complete driven with TEFC squirrel cage induction motor with class-F insulation &amp; efficiency class IE3 suitable for operation on 415 + 10% volts, 3 phase, 50 Hz., AC supply, base plate, MS fabricated mounting channel frame, all required fittings &amp; accessories including coupling, coupling guard, vibration isolation arrangement by means of rubber type mounting, foundation nuts, bolts complete as required &amp; as per specification with following capacities. The pump selected for variable speed drive shall be capable of performing satisfactorily over a wide range of speed, allowing a speed variation from 30 % to 100 %. VFD - The variable frequency drive(s) shall be of pulse width modulation (PWM) type, microprocessor controlled design. It shall be capable of operating in voltage ranges of 380 to 415 V +/- 10% AC, three phase; at frequencies of 47 to 60 Hz and shall be factory fitted and unit mounted. The control should be a low harmonic control with a built-in DC link reactor equivalent in performance to a 5% AC line reactor. VFD shall be IP54 rated. Variable Frequency Drives VFDs should have graphical interface with IP54 Protection to work on Sensor less &amp; with Sensor technology. <b>(1 # Working+1 Standby) FOR ZONE -III(Food court area &amp; Photo gallery area)</b> Water Qty : 1320 USGPM/ Static Head : 40 Mtrs/ Impeller : Bronze/ Speed : 1450 Rpm/ Seal : Mechanical/ Efficiency: NLT 80%</p>	2	Nos.				
A	<p><b>(1 # Working) FOR ZONE -II Additional pump/</b> Water Qty : 430 USGPM/ Static Head : 30 Mtrs / Impeller : Bronze/ Speed : 1450 Rpm/ Seal : Mechanical/ Efficiency : NLT 80%</p>	1	Nos.				

Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
2.2	<b>CONDENSOR PUMPS</b> Supply, installation, testing and commissioning of End suction back pull out water circulation pump in cast iron body & Bronze impeller, mechanical seals, complete driven with TEFC squirrel cage induction motor with class-F insulation & efficiency class IE3 suitable for operation on 415 + 10% volts, 3 phase, 50 Hz., AC supply, base plate, MS fabricated mounting channel frame, all required fittings & accessories including coupling, coupling guard, vibration isolation arrangement by means of rubber type mounting, foundation nuts, bolts complete as required & as per specification with following capacities. <b>(1 #Working + 1 # stand by)/</b> Water Qty : 1870 USGPM/ Static Head : 25 Mtrs/ Impeller : Bronze/ Speed : 1450 Rpm/ Seal : Mechanical/ Efficiency: NLT 80%	2	Nos.				
3.0	<b>PART-03 :- COOLING TOWERS (MULTICELL) ( CTI APPROVED )</b> Supply, installation, testing and commissioning of Multicell FRP induced draft cooling tower with FRP water basin, PVC fills with integral louvers and drift eliminators complete with hot water basin either fitted with spray nozzles or having self rotating sprinklers, statically & dynamically balanced axial flow, gear/direct driven fans with TEFC induction motor of class F insulation, efficiency class IE-3 suitable for operation on 415 + 10% volts, 50 Hz. AC supply; suction screen, make up-quick fill arrangement, overflow and drain connections with all necessary valves & foot valves, suitable inspection ladder, access arrangement for cooling tower interior, steel /masonry supporting structure with proper design, anti-vibration mountings, suitable civil foundation as per manufacturer's standard with foundation nuts, bolts, painting etc. complete as required and as per specification with the following: <b>Capacity : 900 TR x (1 #Working )/</b> Wet bulb temp (monsoon) : 28.56° C/ Entering water temp : 36.00 ° C/ Leaving water temp : 32.00 ° C/ Each Cell Capacity : 300 TR 3 Cell/ Flow rate per cell : 1020 GPM	1	Nos.				
3.1	Structural support for fabrication of cooling tower walkway & other plant room accessories	5	ton				
4.0	<b>PART-04 :- CONDENSER WATER PIPING</b>						
4.1	<b>PART-04 :- CONDENSER WATER PIPING</b> <b>Supply, Installation, Testing ,Commissioning &amp; Water-Balancing of Condenser water piping with 3 mm thick FRP coating for piping outside the building</b> Supplying, fixing,testing and commissioning of condenser water pipes of following nominal sizes of MS 'C' class along with necessary coupling, clamps, vibration isolators and fittings such as bends, tees etc. but excluding valves, strainers, gauges etc. adequately supported on rigid supports duly painted/buried in ground excavation and refilling etc. as per specifications and as required complete in all respect. <b>Note:-</b> The pipes size 150 mm & below shall be M.S. 'C' class as per IS:1239 and pipes size above 150 mm shall be black steel pipe heavy class as per IS:3589, from minimum 6.35 mm thick M.S. sheet for pipes upto 350 mm dia. and from minimum 7 mm thick MS sheet for pipes of 400 mm dia and above.@500 mm dia. 400 mm dia.	140	Rmt.				
4.1.1	350 mm dia.	36	Rmt.				
4.1.2	200 mm dia.	120	Rmt.				
4.2	<b>Supply, Installation, Testing ,Commissioning &amp; Water-Balancing of Condenser water piping without FRP coating</b> Supplying, fixing, testing and commissioning of condenser water pipes of following nominal sizes of MS 'C' class along with necessary coupling, clamps, vibration isolators and fittings such as bends, tees etc. but excluding valves, strainers, gauges etc. adequately supported on rigid supports duly painted/buried in ground excavation and refilling etc. as per specifications and as required complete in all respect. <b>Note:-</b> The pipes size 150 mm & below shall be M.S. 'C' class as per IS:1239 and pipes size above 150 mm shall be black steel pipe heavy class as per IS:3589, from minimum 6.35 mm thick M.S. sheet for pipes upto 350 mm dia. and from minimum 7 mm thick MS sheet for pipes of 400 mm dia and above. @500 mm dia.	30	Rmt.				
4.2.1	250 mm dia.	24	Rmt.				
4.3	<b>Supply, Installation, Testing ,Commissioning &amp; Water-Balancing of Valves &amp; Fittings</b> <b>Butterfly Valves (MANUAL) with CI body SS disc nitrile rubber seal &amp; O - ring &amp; PN 16 pressure rating as specified.</b> @250 mm dia.	6	Nos.				
4.3.1	200 mm dia.	14	Nos.				
4.3.2	100 mm dia.	7	Nos.				
4.3.3	65 mm dia.	7	Nos.				

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4.4	Motorised Butterfly Valves with CI body SS disc nitrile rubber seal & O - ring & PN 16 pressure rating, confirm to BS 5155, IS 13095, with IP-55 actuator, capable of accepting up to 10V DC and upto 20mA electric signal and providing similar transduced feed back output to control system as required & as specified.-@250	1	Nos.				
4.5	Balancing Valves WITH BULTIN MEASURING FACILITY with C I body flanged construction with EPDM coated disc with long pitch with protected out pipe insulation & PN 16 pressure rating for chilled water circulation as specified. @250 mm dia	3	Nos.				
4.6	Wafer Swing Check Valves (Dual Plate) of CI body SS plates vulcanized NBR seal flanged end & PN 16 pressure rating as specified.@250mm dia	2	Nos.				
4.7	Y Strainer of Ductile CI Body flanged ends with stainless steel strainer for chilled / hot water circulation as specified.-@250mm dia	2	Nos.				
4.8	Ball Valves (Manual) with brass body SS Ball, Nitrile Rubber Seal & O- Ring PN 16 pressure rating for chilled water/hot water circulation as specified. @ 25 mm dia	4	Nos.				
4.9	Pressure Gauge 6" Dial ( 0 To 6 Kg/CM <sup>2</sup> ) with approved ball valve. Industrial type pressure gauges with SS syphon, gun metal / brass valves complete as required	4	Nos.				
4.10	U PVC Drain Piping as per specifications ( For Cooling tower Drain) 80 mm dia	36	Rmt				
a	65 mm dia	42	Rmt				
5.0	<b>CHILLED WATER PIPING</b>						
5.1	<b>PART-05 :- CHILLED WATER PIPING</b> <b>Supply, Installation, Testing , Commissioning &amp; Water-Balancing of Chilled water piping in service block &amp; external piping</b> Chilled Water Piping With MS "C" Class Pipe Complete With All Accessories Such As Bends, Elbow, Flanges, Nut Bolts, Air Purging Valves, De-scaling Tee With M.S. Angle & Rod Supporting Work Etc. Of Following Sizes <b>Note:-</b> The pipes size 150 mm & below shall be M.S. `C' class as per IS:1239 and pipes size above 150 mm shall be black steel pipe heavy class as per IS:3589, from minimum 6.35 mm thick M.S. sheet for pipes upto 350 mm dia. and from minimum 7 mm thick MS sheet for pipes of 400 mm dia and above. @450 mm dia.	102	Rmt.				
5.1.1	250 mm dia.	76	Rmt.				
5.1.2	125 mm dia.	12	Rmt.				
5.2	<b>Supply, Installation, Testing , Commissioning &amp; Water-Balancing of Valves &amp; Fittings</b> Motorised Butterfly Valves-PN 16 Rating with Electrical actuator & mounting brackets. CI Butterfly Valve, EPDM Liner, Nylon Coated SS 410/304 Disc, Wafer Design, Flow Control Gear Operated, PN 16 Rating with Electrical actuator & mounting brackets. With PN -65 Rating @250 mm dia.	1	Nos.				
5.2.1	Butterfly Valves (MANUAL) with C I body SS Disc, Nitrile Rubber Seal & O- Ring PN 16 pressure rating for chilled water/ hot water circulation as specified @250 mm dia.	10	Nos.				
a	125 mm dia.	2	Nos.				
5.2.2	Balancing Valves WITH BULTIN MEASURING FACILITY with C I body flanged construction with EPDM coated disc with long pitch with protected out pipe insulation & PN 16 pressure rating for chilled / hot water circulation as specified.@250 mm dia.	3	Nos.				
5.2.3	"Y" Type Stainer of Ductile CI Body flanged ends with stainless steel strainer for chilled / hot water circulation. @250 mm dia.	4	Nos.				
a	125 mm dia.	1	Nos.				
5.2.4	Wafer Swing Check Valves (Dual Plate) Cast iron dual plate check valve, wafer design, Gr. WCB Disc, SS 410 internal, SS 316 Spring, EPDM Seat, Class #150. @250 mm dia.	4	Nos.				
a	125 mm dia.	1	Nos.				
5.2.5	Ball Valves -@25 mm dia.	7	Nos.				
5.2.6	Automatic Air Purge Valves @15 mm dia.	4	Nos.				
5.2.7	Measuring Port With approved make ball valve for Pressure Gauge	10	Nos.				
5.3	<b>Insulation for Chilled Water Pipes/Accessories:</b> Chilled Water Pipe insulation with following thickness Closed Cell Elastomeric Nitrile Rubber Glass Cloth bonded Covered with fire retardent high grade flexible adhesive & sealant ,Fire performance class `O' as specified in specifications. @450 mm dia. (50MM Thick insulation)	102	Rmt.				

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5.3.1	250 mm dia. (44MM Thick insulation)	76	Rmt.				
a	125 mm dia. (44MM Thick insulation)	12	Rmt.				
5.3.2	Motorised Butterfly Valves-PN 16 Rating with Electrical actuator & mounting brackets. CI Butterfly Valve, EPDM Liner, Nylon Coated SS 410/304 Disc, Wafer Design, Flow Control Gear Operated, PN 16 Rating with Electrical actuator & mounting brackets. With PN -65 Rating @250 mm dia. 44MM Thick insulation)	1	Nos.				
5.3.3	Butterfly Valves (MANUAL) with C I body SS Disc, Nitrile Rubber Seal & O- Ring PN 16 pressure rating for chilled water/ hot water circulation as specified @250 mm dia.	10	Nos.				
a	125 mm dia. (44MM Thick insulation)	2	Nos.				
5.3.4	Balancing Valves WITH BUILTIN MEASURING FACILITY with C I body flanged construction with EPDM coated disc with long pitch with protected out pipe insulation & PN 16 pressure rating for chilled / hot water circulation as specified. @250 mm dia. (44MM Thick insulation)	3	Nos.				
5.3.5	"Y" Type Strainer of Ductile CI Body flanged ends with stainless steel strainer for chilled / hot water circulation. @250 mm dia (44MM Thick insulation).	4	Nos.				
a	125 mm dia. (44MM Thick insulation)	1	Nos.				
5.3.6	Wafer Swing Check Valves (Dual Plate) Cast iron dual plate check valve, wafer design, Gr. WCB Disc, SS 410 internal, SS 316 Spring, EPDM Seat, Class #150. @250 mm dia. (44MM Thick insulation)	4	Nos.				
a	125 mm dia. (44MM Thick insulation)	1	Nos.				
5.3.7	Ball Valves -@25 mm dia. (32MM Thick insulation)	7	Nos.				
6.0	<b>CHILLED WATER PIPING</b>						
6.1	<b>PART-06:- CHILLED WATER PIPING PRE-INSULATED CHILLED WATER PIPING (FOR BURIED APPLICATION) FOR ZONE-III</b> Supplying, laying/ fixing, testing and commissioning of following nominal sizes of chilled water piping as per IS 3581 & IS 1239 STD dully insulated with 36 Kg/Cu mt density PUF Insulation dully covered by HDPE jacket minimum thickness of jacket with necessary clamps, vibration isolators and fittings, Excluding valves strainers, gauges. Including repairing of damages to the building complete as per specification, drawing etc as per requirement. Note:-The Pipes of sizes 150 mm & below shall be M.S. 'C' class as per IS : 1239 and pipes size above 150 mm shall be welded black steel pipe heavy class as per IS: 3589, from minimum 6.35 mm thick M.S. Sheet for pipes upto 350 mm dia. and from minimum 7mm thick MS sheet for pipes of 400 mm dia and above. @250 mm dia	1080	Rmt.				
a	200 mm dia.	540	Rmt.				
6.1.1	Supplying, fixing, testing and commissioning of following Pre-Insulated valves, strainers, gauges in the chilled water plumbing duly insulated to the same specifications as the connected piping and adequately supported as per specifications. Pre-Insulated Butterfly Valves (MANUAL) with C I body SS Disc, Nitrile Rubber Seal & O- Ring PN 16 pressure rating for chilled water/ hot water circulation as specified @250 mm dia	1	Nos.				
a	200 mm dia.	1	Nos.				
6.1.2	Pre-Insulated BALANCING VALVE WITH BUILTIN MEASURING FACILITYwith C I body flanged construction with EPDM coated disc with long pitch with protected out pipe insulation & PN 16 pressure rating for chilled / hot water circulation as specified. @250 mm dia	1	Nos.				
a	200 mm dia.	1	Nos.				
6.2	<b>Supply, Installation, Testing , Commissioning &amp; Water-Balancing of Chilled water piping in service block &amp; external piping</b> Chilled Water Piping With MS "C" Class Pipe Complete With All Accessories Such As Bends, Elbow, Flanges, Nut Bolts, Air Purging Valves, De-scaling Tee With M.S. Angle & Rod Supporting Work Etc. Of Following Sizes <b>Note:-</b> The pipes size 150 mm & below shall be M.S. 'C' class as per IS:1239 and pipes size above 150 mm shall be black steel pipe heavy class as per IS:3589, from minimum 6.35 mm thick M.S. sheet for pipes upto 350 mm dia. and from minimum 7 mm thick MS sheet for pipes of 400 mm dia and above. @250 mm dia	42	Rmt.				
6.2.1	200 mm dia.	180	Rmt.				
6.2.2	150 mm dia.	72	Rmt.				
6.2.3	125 mm dia.	24	Rmt.				
6.2.4	100 mm dia.	36	Rmt.				
6.2.5	80 mm dia.	54	Rmt.				
6.2.6	65 mm dia.	12	Rmt.				

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6.2.7	50 mm dia.	30	Rmt.				
6.2.8	32 mm dia.	30	Rmt.				
<b>6.3</b>	<b>Supply, Installation, Testing, Commissioning &amp; Water-Balancing of Valves &amp; Fittings</b> Butterfly Valves (MANUAL) with C I body SS Disc, Nitrile Rubber Seal & O- Ring PN 16 pressure rating for chilled water/ hot water circulation as specified @250 mm dia	1	Nos.				
6.3.1	150 mm dia.	1	Nos.				
6.3.2	125 mm dia.	1	Nos.				
6.3.3	100 mm dia.	14	Nos.				
6.3.4	80 mm dia.	25	Nos.				
6.3.5	65 mm dia.	16	Nos.				
6.3.6	50 mm dia.	28	Nos.				
6.4	Balancing Valves WITH BUILTIN MEASURING FACILITY with C I body flanged construction with EPDM coated disc with long pitch with protected out pipe insulation & PN 16 pressure rating for chilled / hot water circulation as specified. @250 mm dia	1	Nos.				
6.4.1	150 mm dia.	1	Nos.				
6.4.2	125 mm dia.	1	Nos.				
6.4.3	100 mm dia.	2	Nos.				
6.5	"Y" Type Strainer of Ductile CI Body flanged ends with stainless steel strainer for chilled / hot water circulation. @100 mm dia	3	Nos.				
6.5.1	80 mm dia.	6	Nos.				
6.5.2	65 mm dia.	4	Nos.				
6.5.3	50 mm dia.	8	Nos.				
6.5.4	40 mm dia.	1	Nos.				
6.6	Supply, Installation, Testing, Commissioning of 2 Way Pressure Independent control / Balancing Valve for following sizes. The actuator shall be capable of accepting upto 10V DC and upto 20 mA electric signal and shall provide similar transduced feedback output to control system. Maximum close off pressure shall not be less than 6 Bar for upto 50 mm valves and 7 Bar for 65 mm & above. Valves should have pressure rating of 25 Bar minimum. @100 mm dia	3	Nos.				
6.6.1	80 mm dia	6	Nos.				
6.6.2	65 mm dia	4	Nos.				
6.6.3	50 mm dia	8	Nos.				
6.6.4	40 mm dia	1	Nos.				
6.6.5	32 mm dia	1	Nos.				
6.7	Ball Valves-@40 mm dia	3	Nos.				
6.7.1	32 mm dia.	3	Nos.				
6.7.2	25 mm dia.( FOR AHU- Drain)	23	Nos.				
6.8	Ball Valve with Y-strainer set-@32 mm dia	1	Nos.				
6.9	Automatic Air Purge Valves @15 mm dia	46	Nos.				
6.10	Measuring Port With approved make ball valve for Pressure Gauge	42	Nos.				
6.11	Stainless Steel Thermowell for temperature measurement.	46	Nos.				
6.12	Providing and fixing in position the 6" Dial Type Thermometers (0 To 50 <sup>0</sup> C)	42	Nos.				
6.13	U PVC Drain Piping with 13 mm thick nitrile rubber insulation as per specifications ( For Drain) @80 mm dia	24	Rmt				
a	65 mm dia	30	Rmt				
b	50 mm dia	6	Rmt				
c	40 mm dia	12	Rmt				
d	32 mm dia	18	Rmt				
e	25 mm dia	24	Rmt				

Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
6.14	<b>Insulation for Chilled Water Pipes/Accessories:</b> Chilled Water Pipe insulation with following thickness Closed Cell Elastomeric Nitrile Rubber Glass Cloth bonded Covered with fire retardent high grade flexible adhesive & sealant ,Fire performance class `O' as specified in specifications. Chilled Water Piping With MS "C" Class Pipe Complete With All Accessories Such As Bends, Elbow, Flanges, Nut Bolts, Air Purging Valves, De-scaling Tee With M.S. Angle & Rod Supporting Work Etc. Of Following Sizes -@250 mm dia (44MM Thick insulation)	42	Rmt.				
a	200 mm dia. (44MM Thick insulation)	180	Rmt.				
b	150 mm dia. (44MM Thick insulation)	72	Rmt.				
c	125 mm dia. (44MM Thick insulation)	24	Rmt.				
d	100 mm dia. (38MM Thick insulation)	36	Rmt.				
e	80 mm dia. (38MM Thick insulation)	54	Rmt.				
f	65 mm dia. (38MM Thick insulation)	12	Rmt.				
g	50 mm dia. (38MM Thick insulation)	30	Rmt.				
h	32 mm dia. (32MM Thick insulation)	30	Rmt.				
6.14.1	<b>Supply, Installation, Testing , Commissioning &amp; Water-Balancing of Valves &amp; Fittings</b> Butterfly Valves (MANUAL) with C I body SS Disc, Nitrile Rubber Seal & O-Ring PN 16 pressure rating for chilled water/ hot water circulation as specified -@250 mm dia (44MM Thick insulation)	1	Nos.				
a	150 mm dia. (44MM Thick insulation)	1	Nos.				
b	125 mm dia. (44MM Thick insulation)	1	Nos.				
c	100 mm dia. (38MM Thick insulation)	14	Nos.				
d	80 mm dia. (38MM Thick insulation)	25	Nos.				
e	65 mm dia. (38MM Thick insulation)	16	Nos.				
f	50 mm dia. (38MM Thick insulation)	28	Nos.				
6.14.2	Balancing Valves WITH BUILTIN MEASURING FACILITY with C I body flanged construction with EPDM coated disc with long pitch with protected out pipe insulation & PN 16 pressure rating for chilled / hot water circulation as specified. -@250 mm dia (44MM Thick insulation)	1	Nos.				
a	150 mm dia. (44MM Thick insulation)	1	Nos.				
b	125 mm dia. (44MM Thick insulation)	1	Nos.				
c	100 mm dia. (38MM Thick insulation)	2	Nos.				
6.14.3	"Y" Type Stainer of Ductile CI Body flanged ends with stainless steel strainer for chilled / hot water circulation. -@100 mm dia (38MM Thick insulation)	3	Nos.				
a	80 mm dia. (38MM Thick insulation)	6	Nos.				
b	65 mm dia. (38MM Thick insulation)	4	Nos.				
c	50 mm dia. (38MM Thick insulation)	8	Nos.				
d	40 mm dia. (32MM Thick insulation)	1	Nos.				
6.14.4	Supply, Installation, Testing, Commissioning of 2 Way Pressure Independent control / Balancing Valve for following sizes. The actuator shall be capable of accepting upto 10V DC and upto 20 mA electric signal and shall provide similar transduced feedback output to control system. Maximum close off pressure shall not be less than 6 Bar for upto 50 mm valves and 7 Bar for 65 mm & above. Valves should have pressure rating of 25 Bar minimum. @100 mm dia (38MM Thick insulation)	3	Nos.				
a	80 mm dia (38MM Thick insulation)	6	Nos.				
b	65 mm dia (38MM Thick insulation)	4	Nos.				
c	50 mm dia (38MM Thick insulation)	8	Nos.				
d	40 mm dia (32MM Thick insulation)	1	Nos.				
c	32 mm dia (32MM Thick insulation)	1	Nos.				
6.14.4	Ball Valves- @40 mm dia (32MM Thick insulation)	3	Nos.				
a	32 mm dia. (32MM Thick insulation)	3	Nos.				
b	25 mm dia.( FOR AHU- Drain) (32MM Thick insulation)	23	Nos.				



Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
6.14.5	Ball Valve with Y-strainer set -@32 mm dia (32MM Thick insulation)	1	Nos.				
7.0	<b>AIR MOVING EQUIPEMENTS</b>						
7.1	<b>PART-07 :- AIR MOVING EQUIPEMENTS</b> <b>Supply, Installation, Testing &amp; Commissioning OF DOUBLE SKIN TYPE Floor Mounted AHU's (PANEL THICKNESS 43 MM)</b> <b>Comprising of Following :</b> Frame Structure : Extruded profile Aluminium Anodised with True thermal break/ Panels : Double Skin 43mm Thk. PUF/ Inner Skin : 20G .G.I Plain/ Outer Skin : 20G G.I Precoated/ Skid : MS Epoxy Coated/ Drain Pan : 1.2mm Thk SS304 - with 19mm Thk Nitrile Rubber insulation along with 40NB threaded Nipple in SS Construction/ <b>Fan Type : Plug Type/</b> Dampers : Opposed blade aerofoil low leakage Aluminium anodised/ with Mixing chamber, Access Door , Fresh Air dampers ,90 % efficiency down to 10 Micron Box type HDPE Filter/ Coil Section with Access Door: Along with Multi Row deep CHW coil to suite TR mentioned / Fan Section : Motor IE-3/ Supply Air Plenum Section with Access Doors./ Supply Air Dampers / Measurement probes on all sections/ Filter Frames: Should be made out of extruded aluminium Box type section / Cable Entry: Gland Fixing Arrangement/ Isolators: Rubber Block type isolators below fan structure required to avoid vibration & direct contact of fan with AHU structure <b>Sleeves in Panels:</b> Suitable Rubber bellow required for chilled water pipes to avoid the direct contact./ Chilled water coil should have inlet and outlet temperature as 7°C & 12°C respectively. <b>Automatic Control ELECTRICAL CONTROL Panel WITH VFD with following details:</b> Suitable rating incoming MCCB/MCB, VFD of danfoss FC-101 or equivalent make of (380-480 volt) 415 V with communication port for communication & BMS/ Digital ammeter, CTs & control MCBs/ Phase indicating lights & control MCBs ( RYB)/ Push buttons for manual start/stop of motor./ Indicating light for starter on/off/trip./ 220/24V control transformer for 2 way motorized valve/ Expansion valve./ Interlocking terminals & wiring for fire damper, motorized dampers etc. as per control scheme./ All internal wiring and copper earthing of air handling unit motors from the panel shall be included. <b>UNIT TR</b> 55 TR, 10000 CFM, 100 mm Static AHU for Exhibition Hall-3	1	Nos.				
7.1.1	50 TR, 30000 CFM, 100 mm Static AHU for Convention Hall	1	Nos.				
7.1.2	30 TR, 8500 CFM, 65 mm Static AHU for Seminar Hall-3	1	Nos.				
7.1.3	20 TR, 8500 CFM, 80 mm Static AHU for Seminar Hall-4	1	Nos.				
7.1.4	25 TR, 10000 CFM, 65 mm Static AHU for SH-Corridor @ GF	1	Nos.				
7.1.5	65TR, 25000 CFM, 65 mm Static AHU for Photo Gallery Display @ FF	1	Nos.				
7.1.6	20 TR, 8500 CFM, 65 mm Static AHU for Entrance Lobby @ FF	1	Nos.				
7.1.7	65 TR, 25000 CFM, 65 mm Static AHU for Photo Gallery Display @ FF	1	Nos.				
7.1.8	20 TR, 8500 CFM, 65 mm Static AHU for Entrance Lobby @ FF	1	Nos.				
7.1.9	40 TR, 13500 CFM, 50 mm Static AHU for Restaurant & Display @ GF	1	Nos.				
7.1.10	70 TR, 25500 CFM, 50 mm Static AHU for Food court seating @ GF	1	Nos.				
7.1.11	50 TR, 15000 CFM, 50 mm Static AHU for Food court seating -500 @ FF	1	Nos.				
7.1.12	15 TR, 5000 CFM, 50 mm Static AHU for Food court seating -250 @ FF	1	Nos.				
7.2	<b>Supply, Installation, Testing &amp; Commissioning TFA UNIT</b> 35 TR, 7000 CFM, 50 mm Static AHU for Food court kitchen area @ GF	2	Nos.				
7.2.1	18 TR, 3200 CFM, 50 mm Static AHU for Food court continental kitchen-1 area @ GF	1	Nos.				
7.2.2	10 TR, 1800 CFM, 50 mm Static AHU for Food court continental kitchen-1 area @ GF	1	Nos.				
7.2.3	24 TR, 4500 CFM, 50 mm Static AHU for Food court Asian kitchen area @ GF	1	Nos.				
7.2.4	25 TR, 5400 CFM, 50 mm Static AHU for Food court Oriental kitchen area @ FF	1	Nos.				
7.2.5	20 TR, 4500 CFM, 50 mm Static AHU for Food court indian kitchen area @ FF	1	Nos.				
7.2.6	7.5 TR, 1350 CFM, 50 mm Static AHU for Food court bulk cooking @ FF	1	Nos.				

Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
7.3	<p><b>Supply, Installation, Testing &amp; Commissioning CEILING SUSPENDED UNIT 20.0 TR /7500 CFM WITH 50 MM STATIC FOR WEAR WASHING &amp; OTHER BOH AREA @ gf &amp; ff</b></p> <p><b>Comprising of Following :</b>            Frame Structure : Extruded profile Aluminium Anodised with True thermal break/ Panels : Double Skin 43mm Thk. PUF/ Inner Skin : 20G .G.I Plain/ Outer Skin : 20G G.I Precoated / Skid : MS Epoxy Coated/ Drain Pan : 1.2mm Thk SS304 - with 19mm Thk Nitrile Rubber insulation along with 40NB threaded Nipple in SS Construction  <b>Fan Type : Plug Type</b>            Dampers : Opposed blade aerofoil low leakage Aluminium anodised / Access Door , Fresh Air dampers ,90 % efficiency down to 10 Micron Box type HDPE Filter/ Coil Section with Access Door: Along with Multi Row deep CHW coil to suite TR mentioned / Fan Section : Motor IE-3/ Supply Air Plenum Section with Access Doors/ Supply Air Dampers / Measurement probes on all sections/ Filter Frames: Should be made out of extruded aluminium Box type section / Cable Entry: Gland Fixing Arrangement/ Isolators: Rubber Block type isolators below fan structure required to avoid vibration &amp; direct contact of fan with AHU structure/ Sleeves in Panels:/ Suitable Rubber bellow required for chilled water pipes to avoid the direct contact/ Chilled water coil should have inlet and outlet temperature as 7°C &amp; 12°C respectively.  <b>Automatic Control ELECTRICAL CONTROL Panel WITH VFD with following details:</b>            Suitable rating incoming MCCB/MCB, VFD of danfoss FC-101 or equivalent make of (380-480 volt) 415 V with communication port for communication &amp; BMS/ Digital ammeter, CTs &amp; control MCBs/ Phase indicating lights &amp; control MCBs ( RYB)/ Push buttons for manual start/stop of motor/ Indicating light for starter on/off/trip/ 220/24V control transformer for 2 way motorized valve/ Expansion valve/ Interlocking terminals &amp; wiring for fire damper, motorized dampers etc. as per control scheme/ All internal wiring and copper earthing of air handling unit motors from the panel shall be included/</p>	2	NOS.				
7.4	<p><b>Replacing Testing &amp; Commissioning for Existing DOUBLE SKIN TYPE Floor Mounted AHU's with required modification .</b>  <b>Existing installed AHU coil section will replaced with 6 /8 row deep CHW coil to suit TR</b>            77 TR / 17500 CFM FOR EXHIBITION HALL -1 AT PHASE -1A GROUND FLOOR (ZONE-1)</p>	3	Nos.				
7.4.1	63 TR / 16000 CFM FOR EXHIBITION HALL -2 AT PHASE -1A GROUND FLOOR (ZONE-1)	3	Nos.				
7.4.2	63 TR / 16000 CFM FOR CONVENTIONAL HALL AT PHASE -1A GROUND FLOOR (ZONE-2)	6	Nos.				
7.4.3	<p><b>supply, Installation, Testing &amp; Commissioning of Ceiling Suspended low static fan coil units with equipped with adequate sized multi-row chilled water coil, 3 speed fan motor along with its accessories and factory fitted ball valve, ball valve with y strainer set &amp; 2 way pressure independent control / balancing valve of PN 16 Rating duly insulated with Closed Cell Elastomeric Rubber insulation with Extended drain pan &amp; Fire Retardant Quality Flexible Canvas connection between FCU &amp; Duct suitable for following capacities of units. Complete as per specification &amp; drawings. The unit shall be with 2-pipe connection supplied along with its relevant control device with digital display of temperature and other parameters for Heating/cooling application. (ESP-3MM for Ducting length 1.1M- 3.0 M, noise level ≤ 38 Db at 2 M distance from unit). The unit shall have the provision to be connected via BMS for both control and monitoring purposes, additional items required may be specified.</b>            1.5 TR /600 FOR CHEFS OFFICE</p>	1	Nos.				
8.0	<b>DUCTING &amp; AIR DISTRIBUTION</b>						
8.1	<p><b>PART-08 :- DUCTING &amp; AIR DISTRIBUTION</b>  <b>Factory Fabricated G.I Rectangular Ductwork as per SMACNA standard for following gauges</b>            24 G - 0 mm - 750 mm</p>	1600	MT <sup>2</sup>				
8.1.1	22 G - 751mm -1500mm	1900	MT <sup>2</sup>				
8.1.2	20 G - 1501mm -2250mm	1200	MT <sup>2</sup>				
8.2	Powder Coated Extruded Aluminium Anti-smudge SUPPLY AIR Diffuser Of Required Airflow Angles With Al. VCD as per specification	75	MT <sup>2</sup>				
8.2.1	Powder Coated Extruded Aluminium Anti-smudge RETURN AIR Diffuser Of Required Airflow Angles Without Al. VCD as per specification	75	MT <sup>2</sup>				
8.3	Powder coated Extruded Aluminium Continuous Grilles Without Volume Control Dampers as per Tender specification:	420	MT <sup>2</sup>				
8.3.1	Powder coated Extruded Aluminium Continuous Grilles With Volume Control Dampers as per Tender specification:	275	MT <sup>2</sup>				
8.4	Jet Nozzle (300 mm Dia.)	47	Nos.				
8.5	GI Volume Control Dampers for Ducts	60	MT <sup>2</sup>				
8.6	G.I. Fire Dampers in 16G construction with fire rating of 250 Deg. C at least for 2 Hours and UL certification (for new 17 nos AHU)	36	MT <sup>2</sup>				
8.6.1	Actuators	34	Nos.				

Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
8.6.2	Panel & Cabling (in FAS Scope)	1	Job				
8.7	Louvers for Fresh Air with VCD	36	MT <sup>2</sup>				
8.8	Slot diffuser 4 slot	10	rmt				
a	3 slot	10	rmt				
8.9	<b>Insulation</b> Thermal Insulation Of Ducts with Closed Cell Nitrile Rubber Insulation (class "0") of density 40-60 Kg/m3 with, Company Bonded Glass Cloth as per specifications. 19 MM THK	4300	MT <sup>2</sup>				
8.9.1	13 MM THK	950	MT <sup>2</sup>				
8.10	Acoustic Insulation Of Ducts with Open Cell Nitrile Rubber (class "1") Material of density 140-180 Kg/m3 as per specifications. 10 MM THK	475	MT <sup>2</sup>				
8.11	Acoustic Insulation Of AHU Room/ Return Air Box with Open Cell Nitrile Rubber (class "1") Material of density 140-180 Kg/m3 as per specifications. 25MM THK	180	MT <sup>2</sup>				
9	<b>MECHANICAL VENTILATION</b>						
9.1	<b>PART-09 :- MECHANICAL VENTILATION</b> <b>Ceiling Suspended Single skin Cabinet Type DIDW type backward curved fan type Exhaust air units as per specification and of following capacities with Built-In Drive And Drive Package.</b> 500 CFM With 25 MM STATIC FOR Exhibition concourse (ground floor )	1	no.				
9.1.1	500 CFM With 25 MM STATIC FOR Seminar hall Breakout space (ground floor )	2	no.				
9.2	<b>Exhaust Air System - for Kitchen</b> Supply, Installation, Testing and Commissioning of Dry Scrubber unit each comprising of extract air intake section, electrostatic precipitation technology, dry type air cleaner to remove oil, smoke and fumes from exhaust air, as per the Specifications. Electrostatic section shall be made of 16 gauge galvanised sheet, high bake epoxy powder coated, washable type aluminium mesh filters, stainless steel spiked ionizers to create high voltage DC field, aluminum collector plates which should be alternatively charged positive and negative with large collecting area with 14" deep cell, to work as magnet for charged smoke and oil particles. Average efficiency of 90-95% in single pass as per ASHRAE test method. Electrostatic Precipitator should be able to charge particles from 0.01 micron to 10 microns through solid state power supply. Collector cell should be of permanent type and incorporate slide out facility for easy removal for cleaning. Power supplies shall be 100% solid state UL Listed, Module of capacity 3900 CFM & above shall be equipped with Pulse width modulating (PWM)The system should be fitted with interlock switch for safety . The system should allow connection to a fan section to achieve 500 FPM velocity across the air cleaner <b>Floor Mounted Cabinet Type Scrubber Unit With SISW backward curved fan as Per Specification with Drive &amp; Drive Package of Following Capacities.</b> 6000 CFM With 50 mm static Food court - Oriental kitchen section (first floor)	1	nos.				
9.2.1	5000 CFM With 50 mm static Food court - Indian kitchen section (first floor)	1	nos.				
9.2.2	1500 CFM With 50 mm static Food court - Bulk kitchen section & Dish wash (first floor)	2	nos.				
9.2.3	2000 cfm with 50 mm static Food court - Continentak kitchen (ground floor )	1	nos.				
9.2.4	3500 cfm with 50 mm static Food court - Continentak kitchen (ground floor )	1	nos.				
9.2.5	4000cfm with 50 mm static Food court - Asian kitchen section (ground floor )	1	nos.				
9.2.6	5000cfm with 50 mm static Food court - Asian kitchen section (ground floor )	1	nos.				
9.2.7	1600cfm with 50 mm static Food court - Ware washing area (ground floor )	1	nos.				
9.2.8	5600cfm with 50 mm static Food court -Dish washing area (ground floor )	1	nos.				
9.2.9	8000cfm with 50 mm static Food court - Food court Kitchen Area (ground floor )	2	nos.				
9.3	<b>G.I. Sheet Metal Duct Work As Per SMACANA Standard</b> Factory Fabricated G.I. Sheet Metal Duct 24 G - 0 mm - 750 mm	500	MT <sup>2</sup>				
9.3.1	22 G - 751mm -1500mm	300	MT <sup>2</sup>				
9.3.2	20 G - 1501mm -2250mm	200	MT <sup>2</sup>				

Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
9.4	G.I. Volume Control Dampers for Ducts	12	MT <sup>2</sup>				
9.5	Powder Coated Extruded Aluminium Linear Grilles Of Required Airflow Angles With VCD. ( for fresh air)	15	MT <sup>2</sup>				
9.6	Powder Coated Extruded Aluminium Linear Grilles Of Required Airflow Angles Without VCD. ( for exhaust air)	45	MT <sup>2</sup>				
9.7	structural support with vibration isolator pads for Existing ventilation fans BOH /KITCHEN area	15	ton				
10.0	<b>CONTRACTOR'S SCOPE OF WORK - VRV / VRF SYSTEM</b>						
10.1	<b>PART-10 :- CONTRACTOR'S SCOPE OF WORK - VRV / VRF SYSTEM</b> <b>Supply of Variable Refrigerant System</b> <b>Top Discharge Out-door units</b> Supply of Modular type outdoor units equipped with highly efficient scroll compressors, with all inverter type compressor(s), special acryl precoated heat exchanger, low noise condenser fan, auto check function for connection error, auto address setting, with capacities as mentioned below : 36 HP ( COMBINATION OF 2 NOS 18 HP )	1	Nos.				
10.1.1	<b>In-Door Units</b> Supply of Indoor units equipped with pre-filter, fan section with low noise fan, multispeed motor, coil section with DX coil, outer cabinet, drain pan, insulation, pipe connections etc. of various capacities <b>Ceiling Suspended Low Static FCU</b> 3.33 TR	2	Nos				
10.1.2	<b>Ceiling Suspended 4-Way Cassette Unit</b> 3.33 TR	2	Nos				
a	2.67 TR	2	Nos				
b	1.67TR	7	Nos				
10.1.3	<b>Supply of Imported Remote controllers for operation of VRV indoor units</b> Cordless remote controllers	13	Nos				
10.1.4	Supply Imported fittings Y-joints, T-joints and headers for all Indoor units as per layout drawings	13	Pair				
10.1.5	Master Remote control for the VRV system	1	Nos				
10.2.1	<b>Top Discharge Out-door units</b> Receiving, Installation, testing & commissioning Modular type outdoor units equipped with highly efficient scroll compressors, with all inverter type compressor(s), special acryl precoated heat exchanger, low noise condenser fan, auto check function for connection error, auto address setting, with capacities as mentioned below : 36 HP ( COMBINATION OF 2 NOS 18 HP )	1	Nos.				
10.2.2	<b>In-Door Units</b> Receiving, Installation, testing & commissioning Indoor units equipped with pre-filter, fan section with low noise fan, multispeed motor, coil section with DX coil, outer cabinet, drain pan, insulation, pipe connections etc. of various capacities as per drawings <b>Ceiling Suspended Low Static FCU</b> 3.33 TR	2	Nos				
10.2.3	<b>Ceiling Suspended 4-Way Cassette Unit</b> 3.33 TR	2	Nos				
a	2.67 TR	2	Nos				
b	1.67TR	7	Nos				
10.2.4	<b>Receiving, Installation, testing &amp; commissioning of Imported Remote controllers for operation of VRV indoor units</b> Cordless remote controllers	13	Nos				
10.2.5	Receiving, Installation, testing & commissioning Imported fittings Y-joints T-joints and headers for all Indoor units	13	Pair				
10.2.6	Master Remote control for the VRV system	1	Nos				

Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
10.3.1	<b>Supply &amp; Installation of the following components of VRV system: Low Side Work</b> All refrigerant piping between indoor & outdoor units of neatly brazed & should pass thru in sleeves provide in columns / beams. At terrace level & Inside the air-conditioning area refrigerant piping and cabling running should be on the perforated heavy duty cable tray. Refrigerant pipes should be insulated with <b>19mm Thick (Closed Cell Elastomeric/Cross Linked Closed Cell Polyethylene) Tube</b> Insulation with painted <b>Star bond - 30-36</b> fire retardant high grade <b>flexible adhesive and sealant</b> as per specifications.	1	Lot				
10.3.2	Control cables between indoor and outdoor unit laid in PVC pipe and duly epoxy coated Black painted clamped .	1	Lot				
10.3.3	M.S.Structure for installing VRV outdoor units duly epoxy coated.	160	KG				
10.3.4	PVC Drain piping for the units with <b>6mm Thick Closed Cell Elastomeric Nitrile Tube Insulation</b> and duly epoxy coated <b>Black</b> painted clamped .	1	Lot				
<b>TOTAL AMOUNT OF HVAC WORKS RS.</b>							
<b>B</b>	<b>ELECTRICAL WORKS</b>						
1.0	<b>SECTION - 1.0 SUBSTATION EQUIPMENT AND AUXILIARY SUPPLY &amp; INSTALLATION OF INDOOR /OUT DOOR H.T.PANEL</b> -SCOPE OF SUPPLY -Inclusive of All Taxes , Transportation up to site / Transit Insurance , As per SLD Attached , Scope of Labour charges for installation, testing and commissioning of 11 KV panel Inoddoor drawout type VCB cubical switchboards /Out Door type fix SF6/ VCB cubical switchboards with complete internal wiring. The rate shall include the following activities. i) Shifting of panel to the room from site stores/out side if required. ii) Opening of packing. iii) Installation of 11 KV SF6/VCB cubical switchboard on the foundation, supply & grouting of the foundation bolts including supply of foundation bolts, nuts, washers, making pockets in the floor etc. at the location shown at site/in the drawing. iv) Assembling of all the panels, connections of busbars, wiring etc. as per manufactures drawing. APPROVED MAKE -ABB/ SIEMENS / SCHNEIDER / L & T as per attach specification Supply, Installation, testing and Comissioning of indoor type 11 KV Out door drawout type VCB panel (2 IC & 1 OUT GOING FEEDERS with earth switch) REFER SLD Supply, Installation, testing and Commissioning of Indoor type 11 KV drawout type VCB panel ( 1 OUT GOING FEEDER) provision of coupling of main bus into the existing bus to be provided. <b>Also scope of coupling the panel to the existing HT panel to be considered REFER SLD</b>	SET	1.0				
1.1	Supply, Installation, testing and Comissioning of Indoor type 11 KV drawout type VCB panel ( 1 OUT GOING FEEDER) <b>provision of coupling of main bus into the existing bus to be provided. Also scope of coupling the panel to the existing HT panel to be considered REFER SLD</b>	Nos.	1.0				
1.2	<b>SUPPLY &amp; INSTALLATION- OF STEP DOWN DRY TYPE DISTRIBUTION TRANSFORMER WITH OLTC.</b> SCOPE OF SUPPLY -Inclusive of All Taxes , Transportation up to site / Transit Insurance SCOPE OF Labour charges for installation, testing and commissioning of following dry type step down Distribution transformer as shown in the drawing. The rate shall includes the following activity and work. -Unloading & shifting to store of transformer / shifting from store to site (If required) i) Providing transformer on the otta/foundation with all tools, equipments and accessories. ii) Fixing of all transformer accessories etc. as per supplier drawing. iii) Testing of transformer before commissioning. iv) Locking of transformer wheels on the channel. vi) The installation,Testing & Commissioning work shall be completed as per the technical Requirment : All hardware like Nuts, Bolts, Washers, Spring washers etc. require in the installation shall be of Hot deep galvanized. <b>SUPPLY &amp; INSTALLATION OF 11/0.433 KV 2000 KVA DRY TYPE STEP DOWN DISTRIBUTION TRANSFORMER WITH OLTC &amp; RTCC PANEL. (Before ordering Please check technical details of existing transformer for parallel operation)</b>	Nos.	1.0				
1.3	Supply, Termination , testing and commissioning of 11KV (E)H.T. end heat shrink type joints - <b>outdoor type</b> with Raychem/ 3 M make kits for 3C x 300 sqmm AL XLPE SCOPE Includes -megger testing of cable / supply of termination kit with AL lug . Nut blots -washer / tools & teckals require for jointing	Set	1.0				
1.3.1	Supply, Termination , testing and commissioning of 11KV (E)H.T. end heat shrink type joints - <b>outdoor type</b> with Raychem/ 3 M make kits for 3C x 185 sqmm AL XLPE SCOPE Includes -megger testing of cable / supply of termination kit with AL lug . Nut blots -washer / tools & teckals require for jointing	Set	R.0				
1.3.2	Supply, Termination , testing and commissioning of 11KV (E)H.T. end heat shrink type joints - <b>indoor type</b> with Raychem/ 3 M make kits for 3C x 300 sqmm AL XLPE SCOPE Includes -megger testing of cable / supply of termination kit with AL lug . Nut blots -washer / tools & teckals require for jointing	Set	R.0				
1.3.3	Supply, Termination , testing and commissioning of 11KV (E)H.T. end heat shrink type joints - <b>indoor type</b> with Raychem/ 3 M make kits for 3C x 185 sqmm AL XLPE SCOPE Includes -megger testing of cable / supply of termination kit with AL lug . Nut blots -washer / tools & teckals require for jointing	Set	4.0				
1.4	<b>SUPPLY &amp; INSTALLATION OF SAFTY EQUIPMENT</b> Supply and fixing of first aid box.	Nos.	1.0				
1.4.1	Supply & Fixing of 3 nos of fire buckets with floor / wall mounting stand and first filling of sand	Nos.	2.0				
1.4.2	Supply and fixing of 11KV / 1.1 KV grade 2mm(As Per IS-15653 2006) thick 1000 mm wide polymer silicon insulating mat	Mtrs.	25.0				
1.4.3	Shock treatment chart with wooden frame and glass cover. (LOCAL & ENGLISH)	Nos.	2.0				

Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
1.4.4	Modular type fire extinguisher (Clean Agent material) with Sprinklar valve- 15 KG - which operate at 68/ 79 Dec temp with necessary fixing clamps,- for UPS room / BMS ROOM/ Electrical panel room (APPROVED MAKE - HILTY/ SUPER MAX)	Nos.	2.0				
1.5		Rmt.	120.0				
1.5.1	4000 A Flange end	SET	6.0				
1.5.2	Vertical & Horizontal bends for 4000A Bus duct	Nos.	30.0				
1.5.3	Supply & installation of extantion box for Transformer & Panel end with copper bus bar 400mm as per requirement - Max size of box - 800 mm x 800 mm / 1000mm x 600	Nos.	6.0				
1.5.4	COPPER FLEXIBLE JUMPER FOR 4000 AMP ( 3ph+n)	set	6.0				
1.5.5	feed end box with flange end for 4000 Amp out dooe type ( size 1.5m height x 900 mm depth) for TEMP D.G.SET CONNECTION )	SET	2.0				
<b>2.0</b>	<b>SUPPLY &amp; INSTALLATION OF PANEL</b>						
2.0	<b>SUPPLY &amp; INSTALLATION OF PANELS:-</b> SCOPE - SUPPLY OF L.T. PANELS AS PER ATTACH SPECIFICATION INCLUDING -GST/ TRANSPORTATION + INSURANCE + Unloading at site, shifting to final location, assembling, leveling, grouting, erecting, testing and commissioning of following panels as per drawings. Any sort of fabrication work required for erection of panel at site shall be done by the contractor. The contractor shall also check for all the loose joints and continuity of the panel. Any physical or technical defects envisaged by the contractor shall be brought to consultants and clients knowledge. All floor mounted panels shall be with 150mm height stand as per site condition. Kindly note that coupling of MAIN PCC PANEL-3 with existing PCC-2 panel shall be in cotractor scope Scope of Job- inclding required tools / manpower / if require hydra / crane for shifting of panel DG SYNCHRONISING PANEL	No.	1.0				
2.1.1	MAIN PCC PANEL - 3	No.	1.0				
2.1.2	APFC PANEL (650 KVAR)	No.	1.0				
2.1.3	BOH AREA MAIN PANEL	No.	1.0				
2.1.4	MAIN POWER DB	No.	1.0				
2.1.5	HVAC PANEL	No.	1.0				
2.1.6	COOLING TOWER PANEL	No.	1.0				
2.1.7	PHOTOGALLERY HVAC PANEL	No.	1.0				
2.1.8	CONVENTIONAL HALL HVAC PANEL	No.	1.0				
2.1.9	FOOD COURT AREA MAIN PANEL	No.	1.0				
2.1.10	Control wiring for exisiting 2 incomer breaker with new panel for all 3 transformer parrallaing opeartiong	lot	1.0				
2.1.11	<b>Refer SLD for Details</b> <b>ACTIVE HARMONICS FILTER PANEL WITH:-</b> 60A	No.	1.0				
a	120 A	No.	1.0				
2.2	<b>SUPPLY &amp; INSTALLATION OF ENCLOSER- MCCB / MCB/BUSBAR BOX/TIMER with 16G MS powder coated enclosure, necessary busbar /spreader links, rotary handle etc complete. All MCCB upto and including 250A shall be thermal magnetic adjustable and above 250 A shall be with microprocessor trip units. Only O/L AND S/C releases to be given. Approval of GA Drawing By Electrical Consultants /Client is must before fabrication.</b> SITC of 160A 4P MCCB, 16 kA with thermo plastic enclosure complete. IP 65	Nos.	R O				
2.2.2	SITC of 80-125A 4P MCCB, 16 kA with thermo plastic enclosure complete. IP 65	Nos.	R O				
2.2.3	SITC of 32A 4P MCB, 10 kA with thermo plastic enclosure complete.	Nos.	R O				
2.2.4	SITC of 40A-63A 4P MCB, 10 kA with thermo plastic enclosure complete.	Nos.	R O				

Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
2.2.5	SITC of 16-25A DP MCB, 10 kA with thermo plastic enclosure complete.	Nos.	R O				
<b>3.0</b>	<b>SUPPLY &amp; INSTALLATION OF HOT DEEP GALVANIZED CABLE TRAY</b>						
3.0	<b>SECTION - 3.0 SUPPLY &amp; INSTALLATION OF HOT DEEP GALVANIZED CABLE TRAY (80-100 MICRON)</b> Supply, installation of hot dip galvanised, heavy duty, Ladder / perforated type cable trays wire mesh type cable tray as mentioned below. The rate shall include following. (a) Supply of required sized cable trays made from minimum 2 MM M.S. sheet with cross, tees, bends, reducers, coupler fittings etc. (80-100 MICRON) wire mesh type cable tray (b) Fixing of cable tray on G.I./M.S hangers, suspension hooks, clamps, clips etc. (c) Support every 1500- 2000 mm (d) Fixing of cable tray on the support, brackets, hangers, with all necessary G.I. hardwares like bolt, nut, washers, etc. The rate shall include the cost of all necessary tools, hardwares, materials, labour, etc. but shall not include the cost of supply of M.S. angle/channel supports. The work shall be carried out as per the standard practice and as per the guide line given by cable tray manufacturers and to the satisfaction of engineer incharge or consultants. 600 x 50 mm LADDER TYPE	Rmt.	75.0				
3.1.1	450 x 50 mm WIRE MESH TYPE	Rmt.	400.0				
3.1.2	300 x 50 mm WIRE MESH TYPE	Rmt.	100.0				
3.1.3	200 x 50 mm WIRE MASH TYPE	Rmt.	500.0				
3.1.4	100 x 50 mm WIRE MASH TYPE	Rmt.	150.0				
3.2.1	<b>STEEL FABRICATION FOR CABLE &amp; PANEL / BUS TRUNKING SUPPORT / STAGE LIGHTING</b> Supply and erecting fabricated support works / stands etc complete fabricated as per details given from MS flat / angle / plates etc complete with 2 coats of red oxide and 2 coats of paint on the same along with mounting of supports with use of necessary hardwares complete.	TON	1.5				
3.2.2	HANGER SUPPORT USING FULL THEREADED G.I RODS with Anchor Fahsner size as per requirement (10mm/12mm with 100 mm /150 long ) 12 MM FULL THREADED ROD	Rmt.	1000.0				
3.2.2.1	PRE FABRICATED SUPPORT - SLOTTED ANGLE / 'C' , WALL BREAKET -2-3 MM AS PER REQUIRMENT OR GIVEN IN DRAWING ( APPROVED MAKE - HI- TECH PUNE / INDIANA PUNE / EQVLT.)	TON	1.0				
<b>4.0</b>	<b>SUPPLY &amp; INSTALLATION OF MCB DISTRIBUTION BOARD Double Door Type - PPI BOARD (MCB - 'C' CURVE , ELCB - 30-100 mA)</b>						
4.1	<b>SECTION - 4 SUPPLY &amp; INSTALLATION OF MCB DISTRIBUTION BOARD Double Door Type - PPI BOARD (MCB - 'C' CURVE , ELCB - 30-100 mA)</b> Providing, erecting, testing and commissioning a miniature circuit breaker distribution board comprising of Per pahse isolation , single pole, double pole, tripple pole and neutral miniature circuit breakers (MCBs) and earth leakage circuit breakers (ELCBs) as incoming or outgoing. The MCB shall be fabricated from CRCA steel sheet as per the specification given under the heading of MCB DISTRIBUTION BOARD. The job includes grouting the MCBDB flush in to the wall. The box shall have two seperate G.I. studs inside the body for earthing. The top and bottom of the box shall have adequate number of knockouts suitable to receive the conduits and bottom cables. Each outgoing phase will be wired through the DPELCB and the MCBDB shall have DIN rail mounting arrangement for the MCBs & ELCBs. The box shall have a hinged double door kind of arrangement such that the MCBs can be operated only after opening the first door. The doors shall also be suitably earthed. The connecting links used to short the MCBs of each phase shall be of adequate size of copper strip. i) The neutral of each way will be brought at the neutral strip through connectors. The entire box with the doors shall be painted inside & outside with two coats of approved primer and two coats of enamel paint of approved shade. The electrical contractor shall also complete the necessary civil work involved in grouting the MCBDB flush in the wall using 1:2 cement mortar mixture. The box shall also have suitable lettering arrangement for identification of circuits. <b>APPROVED MAKE - LEGRAND / SCHNEDIER (Acti-9) / L &amp; T / hagger</b> <b>VTPN DISTRIBUTION BOARD</b> Supply installation testing and commissioning of 6 way Vertical Distribution board with 80 A TPN MCCB, 25kA as incomer and 6 nos. nos 40 to 63 A TPMCB as outgoing.	Nos.	2.0				
4.1.1	Supply installation testing and commissioning of 6 way Vertical Distribution board with 80 A TPN MCCB, 25kA as incomer and 6 nos. nos 40 to 63 A TPMCB as outgoing.	Nos.	2.0				
4.1.2	Supply installation testing and commissioning of 12 way Vertical Distribution board with 160 A TPN MCCB, 25kA as incomer and 6 nos. 10 A to 32 amp & 2 nos 40 to 63 A TPMCB as outgoing.	Nos.	5.0				
4.1.3	Supply installation testing and commissioning of 8 way Flexi / Vertical Distribution board with 125 A TPN MCCB, 25kA as incomer and 12 nos. 6 A to 32 amp DP MCB as outgoing.	Nos.	5.0				
4.1.4	Supply installation testing and commissioning of 12 way Vertical Distribution board with 250A TPNMCCB, 25kA as incomer and 12 nos 25-63 A TPMCB as outgoing.	Nos.	1.0				

Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
4.2	<b>TPN DISTRIBUTION BOARD (PPI)</b> 12 way PPI DOUBLE DOOR MCBDB - Supply installation testing and commissioning of 12 O/G per phase isolation type double door distribution board with 63A FPMCB as incomer and per phase 40 A DP RCCB,100mA as sub out goings and 36 nos 6-16A SPMCB as out goings. Scope including - erection / painting on support / connection of all circuit wiring / lableing of circuit	Nos.	2.0				
4.2.1	8 way PPI DOUBLE DOOR MCBDB - Supply installation testing and commissioning of 8 O/G per phase isolation type double door distribution board with 63A FPMCB as incomer and per phase 40 A DP RCCB,100mA as sub out going and 24 nos 6-16A SPMCBs as out goings. Scope including - erection / painting on support / connection of all circuit wiring / lableing of circuit	Nos.	8.0				
4.2.2	6 way PPI DOUBLE DOOR MCBDB - Supply installation testing and commissioning of per phase isolation type double door distribution board with 40 FPMCB as incomer and per phase 32 A DP RCCB,30 mA as sub out going and 18 nos 6-16A SPMCB as out goings. Scope including - erection / connection of all circuit wiring / lableing of circuit	Nos.	6.0				
4.2.3	4 way PPI DOUBLE DOOR MCBDB - Supply installation testing and commissioning of per phase isolation type double door distribution board with 40 FPMCB as incomer and per phase 32 A DP RCCB ,100 mA as sub out going and 12 nos 6-16A SPMCBs as out goings. Scope including - erection /connection of all circuit wiring / lableing of circuit	Nos.	2.0				
4.3	<b>SPN DISTRIBUTION BOARD</b> 12 way SPN DOUBLE DOOR Supply, Installation testing and commissioning of 10 way SPN DB with 25A DP RCBO,30ma incomer, 8 nos 6-20A SPMCB as outgoing.Scope including - erection / connection of all circuit wiring / lableing of circuit	Nos.	2.0				
4.3.1	10 way SPN DOUBLE DOOR Supply, Installation testing and commissioning of 8 way SPN DB with 25A DP RCBO,30ma incomer, 6 nos 6-20A SPMCB as outgoing.Scope including - erection connection of all circuit wiring / lableing of circuit	Nos.	2.0				
4.4	<b>Industrial Plug &amp; Sockets.with Top - 1PH / 3PH WITH SWITCH / MCB / RCBO</b> SITC of 16A DP RCBO 30mA -2 NOS. 6-16 A SP MCB, 10 kA with thermo plastic enclosure complete.	Nos.	2.0				
4.4.1	SITC of 20 A 1 phase 3 pin Thermo Plastic type industrial plug sockets of IP 65 category with DP RCBO complete in thermo plastic encloser . (cost of cable or wiring for the same shall be paid in rmt)	Nos.	50.0				
4.4.2	SITC of 32 A 3 phase 5 pin Thermo Plastic type industrial plug sockets of IP 65 category with 4P RCBO complete in thermo plastic encloser . (wiring for the same shall be paid in rmt)	Nos.	50.0				
4.4.3	SITC of 20 A 1 phase 3 pin Metal Clad type industrial plug sockets with DP MCB complete in Metal encloser . (cost of cable or wiring for the same shall be paid in rmt)	Nos.	10.0				
4.4.4	SITC of 32 A 3 phase 4 pin Metal clad type industrial plug sockets with 4P MCB complete in Metal encloser . (cost of cable or wiring for the same shall be paid in rmt)	Nos.	10.0				
4.4.5	Supply, installation of Caution stickers 100 x 100 mm	Nos.	10.0				
5.0	<b>SUPPLY &amp; LAYING OF XLPE ARM. POWER &amp; CONTROL CABLES</b> <b>SECTION - 5.00 SUPPLY &amp; LAYING OF XLPE ARM. POWER &amp; CONTROL CABLES</b> Supply, Laying, testing and commissioning of cables on cable trays, structural supports and cable supports provided, include unloading, shifting upto site. The scope includes clamping of cables by ready made G.I. spacers, saddles or clamps fabricated out of M.S. strip 3 mm thick, Treasing and Clamping of Cable on cable tray, supply of all clamping materials and hardware etc., providing cable tags made out of aluminium strip and 75x20 mm in size with cable number and size punched on it Or Plastic material with mark cable number / size . Cable tags shall be tied to cables at every 20 meter interval and at both the ends. Supports provided for clamping of cables upto individual motors and push-buttons shall be paid extra as per item rate for MS fabrication work. Empty cable drums shall be returned to stores. In case of laying unlisted cables, rate of cable whose outer dia is closest to the cable sizes quoted shall be applicable. The same shall hold good for cable termination also Procurement of cables shall be on the basis of actual site measurements and the quantities shown in the schedule of work shall be regarded as a guide only. 300 SQMM X 3.5C AL CABLE XLPE ARM	Rmt.	750.0				
5.1.1	185 SQMM X 3.5C AL CABLE XLPE ARM	Rmt.	150.0				
5.1.2	120 SQMM X 3.5C AL CABLE XLPE ARM	Rmt.	750.0				
5.1.3	95 SQMM X 3.5C AL CABLE XLPE ARM	Rmt.	150.0				
5.1.4	50 SQMM X 3.5C AL CABLE XLPE ARM	Rmt.	250.0				
5.1.5	35 SQMM X 3.5C AL CABLE XLPE ARM	Rmt.	350.0				
5.1.6	25 SQMM X 4C AL CABLE XLPE ARM	Rmt.	250.0				
5.1.7	10 SQMM X 4C CU CABLE XLPE ARM	Rmt.	300.0				
5.1.8	6 SQMM X 4C CU CABLE XLPE ARM	Rmt.	250.0				



Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
5.1.9	4 SQMM X 4C CU CABLE XLPE ARM	Rmt.	500.0				
5.1.10	6 SQMM X 3C CU CABLE XLPE ARM	Rmt.	200.0				
5.1.11	4 SQMM X 3C CU CABLE XLPE ARM	Rmt.	500.0				
5.1.12	2.5 SQMM X 3C CU CABLE XLPE ARM	Rmt.	1000.0				
5.1.13	1.5 SQMM X 3C CU CABLE XLPE ARM	Rmt.	500.0				
5.1.14	300 sq mm x 3C 11KV HT XLPE (E) CABLE	Rmt.	150.0				
5.1.15	185 sq mm x 3C 11KV HT XLPE (E) CABLE	Rmt.	100.0				
5.1.16	4 SQMM X 4C CU CABLE flexible FRLS CABLE	Rmt.	650.0				
5.1.17	2.5 SQMM X 3C CU CABLE flexible FRLS CABLE	Rmt.	500.0				
5.1.18	4 SQMM X 3C CU CABLE flexible FRLS CABLE	Rmt.	500.0				
5.1.19	<b>COPPER FLEXIBLE XLPE CABLE 1100 VOLT</b> 1C X 300 SQMM for chiller	Rmt.	150.0				
5.1.20	1C X95 SQMM	Rmt.	R.0				
5.1.21	1C X10 SQMM Procurement of cables shall be on the basis of actual site measurements and the quantities shown in the schedule of work shall be regarded as a guide only.	Rmt.	100.0				
<b>6.0</b>	<b>CABLE TERMINATION</b>						
6.1	<b>SECTION - 6.00 CABLE TERMINATION</b> Supply & Fixing Double compression Glands Brass glands & making joint with necessary AL./CU. crimping socket(As per Cable MOC) of long neck type connecting the same to various equipment like section pillar, switch, starter, motor etc. for the following sizes Crimping shall be done with use of Hydraulic Crimping tool only: 300 SQMM X 3.5C AL CABLE XLPE ARM	Nos.	20.0				
6.1.1	185 SQMM X 3.5C AL CABLE XLPE ARM	Nos.	4.0				
6.1.2	120 SQMM X 3.5C AL CABLE XLPE ARM	Nos.	20.0				
6.1.3	95 SQMM X 3.5C AL CABLE XLPE ARM	Nos.	4.0				
6.1.4	50 SQMM X 3.5C AL CABLE XLPE ARM	Nos.	8.0				
6.1.5	35 SQMM X 3.5C AL CABLE XLPE ARM	Nos.	20.0				
6.1.6	25 SQMM X 4C AL CABLE XLPE ARM	Nos.	20.0				
6.1.7	10 SQMM X 4C CU CABLE XLPE ARM	Nos.	20.0				
6.1.8	6 SQMM X 4C CU CABLE XLPE ARM	Nos.	30.0				
6.1.9	4 SQMM X 4C CU CABLE XLPE ARM	Nos.	30.0				
6.1.10	6 SQMM X 3C CU CABLE XLPE ARM	Nos.	20.0				
6.1.11	4 SQMM X 3C CU CABLE XLPE ARM	Nos.	40.0				
6.1.12	2.5 SQMM X 3C CU CABLE XLPE ARM	Nos.	250.0				
6.1.13	1.5 SQMM X 3C CU CABLE XLPE ARM	Nos.	10.0				
6.1.14	<b>COPPER FLEXIBLE XLPE CABLE 1100 VOLT using PVC GLAND</b> 4 SQMM X 4C CU CABLE flexible FRLS CABLE	Nos.	50.0				
6.1.15	2.5 SQMM X 3C CU CABLE flexible FRLS CABLE	Nos.	76.0				
6.1.16	4 SQMM X 3C CU CABLE flexible FRLS CABLE	Nos.	32.0				
6.1.17	1C X 300 SQMM for chiller	Nos.	12.0				
6.1.18	1C X95 SQMM	Nos.	R.0				
6.1.19	1C X10 SQMM	Nos.	6.0				
<b>7.0</b>	<b>POINT WIRING :- LIGHTING &amp; POWER</b>						

Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
7.10	<b>SECTION - 7.00 POINT WIRING : - LIGHTING &amp; POWER</b> Point wiring shall be done with supply, installation, testing and commissioning of FRLS category 3 x 1.5 sq mm wires from modular switches to light outlet in concealed/Surface manner including FR grade ISI PVC conduit of 25 mm diameter 1.6-1.8mm (MMS Grade) thickness OR oval shape pvc pipe OR box type capping . Mains of 2.5 sq mm x 2 nos+1.5 sq mm x 1 nos wires from D.B. to switchboard shall be shall be part of point rate. (MAX 25 MTR). SITC of Modular switches, sockets, regulators, blank plates, front plates, switchboard, PVC conduit and accessories like bends, couplers, zinc passivated MS fan boxes with Hook, connectors, ferruling, junction boxes (depth 75 mm for cancelled ), zarru making and semi finishing etc are part of the point rate. All wire ends shall be lugged properly and ferruled at both D.B. and S.B. end. All boxes shall be 1.6 mm thick M.S. boxes zinc passivated for S.B. All wire sizes unless specified below shall be as per specifications. Slotted angle cum threaded rods shall be used for main path of conduiting through corridors which is deemed to be included in rates quoted. - Front plate for all UPS shall be of different colour as per architect's approval. Earth wire shall be one size smaller than the phase wire - limited to min. size of 1.5 sqmm. ( MAKE OF ACESOIRES AS PER EXISITNG ACCESSOIRES) Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed medium class PVC conduit, with modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable etc. as required.	Point	250.0				
7.2	Wiring for group controlled (looped) light point / fan point / exhaust fan point/ call bell point (without independent switch etc.) with 1.5 sq. mm FRLS PVC insulated copper conductor single core cable in surface/ recessed PVC conduit, and earthing the point with 1.5 sq. mm FRLS PVC insulated copper conductor single core cable etc. as required..	Point	650.0				
7.3	Supplying and drawing following sizes of FRLS PVC insulated copper conductor, single core cable in the existing surface/ recessed steel/ PVC conduit as required. 3 x 1.5 sq. mm	Rmt.	800.0				
7.3.1	6 x 1.5 sq. mm	Rmt.	600.0				
7.3.2	9 x 1.5 sq. mm	Rmt.	300.0				
7.3.3	3 x 2.5 sq. mm	Rmt.	500.0				
7.3.4	4 x 2.5 sq. mm	Rmt.	250.0				
7.3.5	6 x 2.5 sq. mm	Rmt.	300.0				
7.3.6	2 x 4 + 1 X 2.5 sq. mm	Rmt.	500.0				
7.3.8	4 x 4 sq. mm + 1 X 2.5 sq.mm	Rmt.	200.0				
7.3.9	4 x 6 sq. mm + 1 X 4 sq.mm	Rmt.	250.0				
7.4	Supplying and fixing of following sizes of medium class PVC conduit along with accessories in surface/recess including cutting the wall and making good the same in case of recessed conduit as required. 20mm	Rmt.	150.0				
7.4.1	25 mm	Rmt.	4500.0				
7.4.2	32 mm	Rmt.	1000.0				
7.5	Supplying and fixing of following sizes of steel conduit along with accessories in surface/recess including painting in case of surface conduit, or cutting the wall and making good the same in case of recessed conduit as required. 25mm	Rmt.	150.0				
7.5.1	32 mm	Rmt.	150.0				
7.5.2	40 mm	Rmt.	100.0				
7.6	Supplying and fixing <b>two module stepped type electronic fan regulator</b> on the existing modular plate switch box including connections but excluding modular plate etc. as required.	No's	25.0				
7.7	Supplying and fixing <b>modular blanking plate</b> on the existing modular plate & switch box excluding modular plate as required.	No's	100.0				
7.8	One 6 A x 3 pin 230 Volt socket (UNIVERSAL) outlet point controlled by one 6 A switch located on switch board.	Nos.	75.0				
7.9	6 A x 230 Volt 3 pin socket (UNIVERSAL) outlet point controlled by 6 A switch at convenient location including box plate etc complete to be done with 1.5 sq mm ckt from D.B.	Nos.	30.0				
7.10	2 Nos. - 6 A x 230 Volt 5 pin socket (UNIVERSAL) outlet point controlled by 2 nos. 6 A switch at convenient location including box plate etc complete to be done with 2.5 sq mm ckt from D.B.	Nos.	25.0				

Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
7.11	1 nos 6/16A x 230 Volt 6 pin socket (UNIVERSAL) outlet point with 16 A switch with box and plate complete to be done with 4 sq mm wire ckt from D.B. complete.	Nos.	75.0				
7.12	2 nos 6/16A x 230 Volt 5 pin socket (UNIVERSAL) outlet point with 2 nos. 16 A switch with box and plate complete to be done with 4 sq mm wire ckt from D.B. complete.	Nos.	10.0				
7.13	COMPUTER POWER 2 nos 6A x 230 Volt 3 pin socket (UNIVERSAL) outlet point with 6 A switch with box and plate complete to be done with 2.5 sq mm Flexible Copper wire ckt from D.B in prelaid through floor raceway or conduit. Conduits at DB and furniture end shall be part of point rate.	Nos.	100.0				
<b>8.00</b>	<b>SUPPLY AND INSTALLATION OF LIGHT FIXTURES &amp; FANS</b>						
8.1a	<b>SECTION -8.00 SUPPLY AND INSTALLATION OF LIGHT FIXTURES &amp; FANS :</b> Supply, Installation, testing & commissioning of standard light fittings and lighting accessories including lamp. The scope shall include, providing of all hardware such as nuts, anchor fasteners, bolts, screws, cleats, clamps, PVC insulated wires / cables from Junction box to lighting fixtures, ball and socket arrangement with J.B., suspension conduit pipe for drop for fluorescent fitting. The cost of fabrication and installation of MS supports will be paid extra as per rates quoted elsewhere. All fixtures shall be with Electronic ballasts of APFC type APPROVED MAKES :PHILIPS /QLITE/ WIPRO /RLT NOTE : Light fixtures make and type to be approved from consultant / architect / client before procurement 15W LED round light fixture Philips make Cat DN 194B LED15S or equivalent from approved make	Nos.	514.0				
8.1b	10W LED round light fixture Philips make, Cat DN 192B LED9S or equivalent from approved make	Nos.	505.0				
8.1c	7 W LED round light fixture Philips make, Cat DN 191B LED6S or equivalent from approved make	Nos.	10.0				
8.1d	18 W LED round light fixture Philips make, Cat DN195B LED20S or equivalent from approved make	Nos.	146.0				
8.1e	25 W LED square light fixture Philips make, Cat RC380B LED 30S - 6500 G4 L60 W60 PSU OD or equivalent from approved make	Nos.	1202.0				
8.1f	16 W LED 4 ft tube light fixture Philips make, Cat TMC 501 - 1X16 W TLED or equivalent from approved make	Nos.	100.0				
8.1g	16 W LED 4 ft tube light fixture Philips make, Cat TMC 501 - 2X16 W TLED or equivalent from approved make	Nos.	52.0				
8.1h	10 W LED 2 ft tube light fixture Philips make, Cat BN021 LED 10S-6500 PSU GRS1 or equivalent from approved make	Nos.	99.0				
8.1i	16 W LED cove light fixture Philips make, Cat TMC 501 - 1X16 W TLED or equivalent from approved make	Nos.	238.0				
8.1j	70 W LED high bay light fixture Philips make, Cat BY400V BY150P LED75S or equivalent from approved make	Nos.	64.0				
8.1k	210 W LED high bay light fixture Philips make, Cat BY416P LED240S CW SK60 FG GR NI S5 or equivalent from approved make	Nos.	138.0				
8.1l	1200 mm dia ceiling fan.	Nos.	R.O				
8.20	<b>SUPPLY AND INSTALLATION OF EXTERNAL LIGHT CONTROLLER</b> Installation, testing & commissioning of dust, damp, vermin proof, weather proof type double door construction I P 65 proection fabricated from 2mm thick M.S. sheet including locking arrangement complete with incomer MCCB, busbar, ammeter, ammeter selector switch, voltmeter, voltmeter selector switch, CT's, indicator lights, protection MCB including all civil works for Feeder Pillar foundation like excavation, PCC, bricks work, plastering, refilling, providing PVC sleeves in foundation etc. including epoxy painting of feeder pillar, interconnection etc complete as per specifications as required. Astronomical time switch (with BMS communication ) for each phase of following configuration to be mounted for automatic switching On & OFF of street lights at sun set & sun rise or twilight (Auto ON, Auto OFF, Auto modes) with manual override facility with 12/24 hour display format with suitable battery and indication for relay status i/c programming at site complete as required./3 output (1output per phase) and suitable for three phase supply. It shall comprise of : It shall comprise of : Incoming : 1 No 63 Amp TPN MCCB 25kA with O/C, S/C Protection 40 Amp TP contactor with 40A DP MCB, 10kA for each Phase (3 no's) indicating lamps. 1 No 10 Amp toggle switch for Auto/Manual mode. 1 set of ON-OFF push button. Outgoing : 18 Nos. of 16 Amp. SP MCBs.	Nos.	2.0				

Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
8.3	Astronomical time switch (with BMS communication ) for each phase of following configuration to be mounted for automatic switching On & OFF of street lights at sun set & sun rise or twilight (Auto ON, Auto OFF, Auto modes) with manual override facility with 12/24 hour display format with suitable battery and indication for relay status i/c programming at site complete as required./3 output (1output per phase) and suitable for three phase supply It shall comprise of : Astronomical time switch (with BMS communication )- 3nos. 40 Amp TP contactor with 40A DP MCB, 10kA for each Phase (3 no's) indicating lamps. 1 No 10 Amp toggle switch for Auto/Manual mode. 1 set of ON-OFF push button.	Nos.	4.0				
<b>9.0</b>	<b>SUPPLY, INSTALLATION TESTING AND COMISSIONING OF STAGE LIGHTING AND EQUIPMENTS</b>						
9.1	<b>SUPPLY, INSTALLATION TESTING AND COMISSIONING OF STAGE LIGHTING AND EQUIPMENTS (LIGHT FIXTURES SHOULD BE LED ONLY)</b> <b>APPROVED VENDORS FOR STAGE LIGHTING : LIGHT WAVE SOLUTIONS, HITECH AUDIO</b> <b>NOTES :</b> <b>a) contractor supposed to provide the stage lighting system integrator as per the approved vendors only</b> <b>b) Contractor has to inform if any items are missing in the BOQ befor submission of tender.</b> <b>C) Scope of the vendor includes integration of complete system as per the approved design.</b> <b>d) vendor has to give training for the client's engineer about the complete system (operation and maintenance)</b> <b>e) Contractor has to submit the colour rendering presentation as per site condition and to be get approval from consultant / architect / client before finalization of vendor.</b> <b>f) Contractor to co-ordinate with the stage lighting vendor and to provide the supporting structure (supply and erection complete) for the stage lighting as per stage lighting vendor requirement. Supporting structure item not to be included in stage lighting part. Item no. 3.2.3 to be considered for the same</b> The Quantum Wash features tight beams, beautiful wash fields, a market-leading color palette, and uniform mixing that combines to accommodate the most demanding applications, offering brightness and perfection. Combining an impressive 750 watt of RGBW LED power with market leading optical system ensures that the 1:5 zoom on the Quantum Wash operates with maximum output and superior performance. Color mixing: RGBW. Beam effects: Beam twister, light and color morphing, color spin 'Color wheel' effect: 36 solid colors plus white, variable-speed 'color wheel rotation' effect and random color Color ring effects: 36 split ring colors with variable-speed color wheel rotation effects Shutter effect: Electronic, with variable speed regular and random strobe. Electronic dimming: Four dimming curve options Color temperature control: Variable 2000 - 10 000 K Zoom: Motorized Pan: 540° Tilt: 270°. DMX compliance: USITT DMX512-A RDM compliance: ANSI/ESTA E1.20. Light source: 50 x 15 W RGBW LEDs. Minimum LED lifetime: 50 000 hours (to >70% luminous output)* Zoom range: 11-53° (1:5) Output: 16 000 lm. Color: Black Housing: High-impact flame-retardant thermoplastic Protection rating: IP20. - <b>Approved makes :- MARTIN / ROBE /CHAUVET</b>	no's	2.0				
9.2	This extremely bright LED profile fixture combines top-quality white light with a fast, smooth CMY color mixing system and crisp gobo projection on surfaces as well as mid-air. With all this and the new Animotion™ FX system that allows never-before seen beam animations, the market is now finally seeing the first real 700/800 W discharge lamp replacement in a profile fixture that effectively harnesses cutting-edge LED technology. Color mixing: CMY, independently variable 0 - 100% Color wheel: 6 color filters plus open Rotating gobo wheel: 6 interchangeable gobos plus open, wheel rotation, gobo rotation, indexing and shake Static gobo wheel: 10 gobos plus open, wheel indexing, rotation and shake Beam effects: Rotating three-facet prism Zoom: Motorized Focus: Motorized, with zoom-focus tracking Iris: 0 - 100%, pulse effects Shutter effect: Electronic, with variable speed regular and random strobe Electronic dimming: Four dimming curve options Pan: 540° Tilt: 268°. RDM compliance: ANSI/ESTA E1.20 Transceiver: RS-485. Light source: 475 W LED engine LED refresh rate: 3000 Hz Minimum LED lifetime: 50 000 hours (to >70% luminous output)* Zoom range: 12° - 36° (1:3) Output: 12 700 lumens. Color: Black Housing: High-impact flame-retardant thermoplastic Protection rating: IP20. <b>Approved makes :- MARTIN / ROBE /CHAUVET</b>	no's	2.0				

Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
9.3	<p>The Wash CT is designed for key lighting applications within the House of Worship, Performing Arts and Live Stage environments where color temperature control of white light is critical but also a compact and light weight design is desired for smaller applications</p> <p>The WASH CT is a bright single-lens LED moving head with fully premixed white color temperatures. With twelve 10W WW/CW (warm white and cold white) LEDs and a 10° to 60° motorized zoom, it offers full electronic dimming and variable strobe effects controlled via DMX. Zoom range: 10° - 60°. Color temperature: 2700 K - 7800 K Color temperature presets: 2700 K to 7800 K in ~100 K steps Electronic dimming: 16-bit, 0 - 100%, four dimming curve options Strobe and pulse effects: Variable speed and action, random strobe Electronic 'shutter' effect: Instant open and blackout Zoom: Motorized, 10 - 60° Pan: 540°, 16-bit control Tilt: 220°, 16-bit control. DMX compliance: USITT DMX512/1990. Light source: 12 x 10 W CWUW LEDs Minimum LED lifetime: 50 000 hours (to &gt;70% luminous output)* Zoom range: 10° - 60°. Housing: High-impact flame-retardant thermoplastic Color: Black Ingress protection rating: IP20. <b>Approved makes :- MARTIN / ROBE / CHAUVET / ETC(USA)</b></p>	no's	4.0				
9.4	<p>The 2 RGBW Zoom is a bright single-lens LED PAR Can with fully premixed color from 12 RGBW LEDs and a spectacular 10 – 60 ° zoom. It offers electronic dimming and strobe and comes with a flexible bracket for floor or truss mounting, 12x10 W RGBW LEDs, 151 W. Color mixing: RGBW Color selection: 33 color presets plus full white, 'color wheel' effects Electronic dimming: 0 - 100% Strobe and pulse effects: Variable speed and action, random strobe Electronic 'shutter' effect: Instant open and blackout Zoom: Motorized. Protocol: USITT DMX512/1990. Light source: 12 x 10 W RGBW Osram Ostar LEDs Zoom range: 10° - 60° Minimum LED lifetime: 50 000 hours (to &gt;70% luminous output)*. Housing: Aluminum Color(s): Black Protection rating: IP20. <b>Approved makes :- MARTIN / ROBE / CHAUVET</b></p>	no's	6.0				
9.5	<p>The Beam is a powerful beam moving head that blasts an intense and narrow long-throw beam for spectacular mid-air looks and effects. It houses a fixed gobo wheel and color wheel with a multitude of effects possible from a dimmer, strobe effect, 8-facet prism and focus. Zoom range: 1° - 3.8°. Color wheel: 14 colors plus open, rotation with variable direction and speed Static gobo wheel: 17 gobos plus open, wheel rotation and shake Pre-programmed effects: 31 pan and tilt macros, adjustable speed Shutter: Strobe effect, pulse effects, instant open and blackout Prism: 8-facet, indexing and rotation with variable direction and speed Frost: Fade in/out Zoom: Motorized Focus: Motorized Dimmer: 0 - 100%, four dimming curve options Pan: 540° Tilt: 220°. DMX compliance: USITT DMX512/1990. Approved lamp: Philips MSD Platinum 5R Color temperature: 8000 K CRI (Color rendering index): 75 Average lifetime: 2000 hours. Zoom range: 1° - 3.8°. Color: Black Housing: High-impact flame-retardant thermoplastic Protection rating: IP20. <b>Approved makes :- MARTIN / ROBE / CHAUVET</b></p>	no's	2.0				
9.6	<p>C-Plus Haze Fluid is a water-based haze formula that is specifically designed for use in the JEM Hazer Pro and JEM Compact Hazer Pro. C-Plus Haze fluid is a dense molecular formula that produces very fine haze particles, specially designed to highlight beam and mid-air light effects, projections and lasers. The fluid produces an evenly dispersed atmospheric haze for optimal visual clarity while maintaining a peak refraction index. 25 containers. <b>Approved makes :- MARTIN / ROBE / CHAUVET</b></p>	no's	1.0				
9.7	<p>The 5.5 Splitter is the perfect companion to any controller or DMX device. The main purpose of the 5.5 Splitter is to maintain proper data over long or several runs of DMX signal. The Splitter boosts the weak DMX signal to its original output level before it becomes too low to be read by DMX devices. Disruption of DMX is often caused by bad cables or bad connections. The 5.5 Splitter will help to rectify the signal. DMX: ANSI E1.11 (USITT DMX 512-A) ANSI E1.20 Electrical standard: EIA-485 Recommended cable type: STP (Shielded Twisted Pair) Recommended cable gauge: 22 or 24 AWG. Housing: Aluminum Finish: Electrostatic powder-coated. Data input: 5-pin XLR male Data throughput (not amplified or branched): 5-pin XLR female Data outputs (optically isolated and amplified): 5 x 5-pin XLR female. <b>Approved makes :- MARTIN / ROBE / CHAUVET</b></p>	no's	2.0				

Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
9.8	Control and Programming Protocol: DMX512A, Art-Net2, sACN 4 physical DMX ports 20 DMX universes integrated No limit to number of DMX channels per fixture Extensive fixture library for all known manufacturers 65000 presets for each group of functions (P/T, color, gobo, etc.) Effect generator for automated programming of complex effects Customizable highlight and lowlight function to identify individual fixtures Relative or absolute programming Fan function for all channels (including timing parameters) On-the-fly global timing changes Virtual cuelists Macros Wait, follow and link cues HTP, LTP, chase, timecode, submaster and group master playback functionality Individual parameter timings Intuitive patch feature Fixture type cloning All channels with 16-bit resolution. Main playback interface: Ten 60 mm playback faders, each with four function-assignable buttons Eight customizable multi-function keys Playback Select button Master Go section with Go, Pause, Snap and Release Four digital rotary encoders with push function and status LED for fixture parameter control 3.5" touchscreen for parameter groups, effect parameters, fanning and global timings and button Built-in 2D visualizer for selection and real-time visualization Grand master rotary fader Blind/preview button Customizable highlight/lowlight function Customizable parameter defaults Next/last fixtures/groups Large command keys. Assign a cue, cuelist or effect to any playback fader 500 playback banks, each containing 10 playbacks 100 pages of 100 playbacks activated by touchscreen button No limit to cues per cuelist Full 16-bit fading for high-resolution fixtures Individual fade in/fade out times for all playbacks Manual override available at all times Live 0-1000% override of global cue timings Live programmer timing ("Sneak") Cuelists can be executed in tracking or non-tracking mode. Industrial 15.6 inch TFT 16:9 touchscreen (1376x768 pixels) 3.5" RGB touchscreen 64 GB SSD storage drive Industrial motherboard with Intel Quad-Core processor 8 GB RAM Integrated graphics processor. <b>Approved makes :- ELATION/ ROBE /Avolites(UK)</b>	no's	1.0				
9.9	Twisted pair shielded cable for DMX control Approved make:Beldon make 9841 DMX cable / Klotz / Crystal. <b>DMX control cables should be high impedance type (110-150 ohm)</b>	rmt	1000.0				
9.10	5 PIN , 3 PIN Male / Female connectors and other accessories as per site condition and vendor requirement	lot	1.0				
<b>10.00</b>	<b>SUPPLY &amp; INSTALLATION OF EARTHING MATERIAL</b> <b>INSTALLATION DETAILS</b>						
10.1	<b>SECTION - 10.00 SUPPLY &amp; INSTALLATION OF EARTHING MATERIAL</b> <b>INSTALLATION DETAILS- SCOPE OF WORK FOR MAKING EARTH PIT</b> Bore- 300mm filling with compound paste- vertically placed electrode in center of pit(no use of hammer), make paste of compound of black soil (if available)- fill up in bore/pit, ensure no air gap in compound- use water to remove air gap. Also follow manufacture installation details to get resistance (less than 1 ohm) Supply & making of maintenance free Earthing station with the use of 19/21 mm dia copper rod, 3M long- ,with 50kg- grounding material(back fill compound with moisture capture capacity and reuse soil) resistivity - scope includes supply of electro/ back fill compound / labour charges fo bore of 300- 3.5 mtrs depth/making earth chamber with 450 mm x 450 mm x CI / FRP cover Installation detail - making 3.5 m depth bore - 100 mm fill with chemical compound paste / put electrode in centre of bore / fill up balance space of bore with chemical compound / balck cotton soil ( if avilable ) paste - carrefull for no air gap in paste , also co-ordinate with electrode / compound manufacturer to achieve less than 1 ohm	Nos.	8.0				
10.2	Supply & making of maintenance free Earthing station with the use of <b>50mm dia Hot Dip Galvanized pipe</b> , 3M long- ,with 50kg- grounding material(back fill compound with moisture capture capacity and reuse soil) resistivity - scope includes supply of electro/ back fill compound / labour charges fo bore of 300- 3.5 mtrs depth/making earth chamber with 450 mm x 450 mm x CI / FRP cover Installation detail - making 3.5 m depth bore - 100 mm fill with chemical compound paste / put electrode in centre of bore / fill up balance space of bore with chemical compound / balck cotton soil ( if avilable ) paste - carrefull for no air gap in paste , also co-ordinate with electrode / compound manufacturer to achieve less than 1 ohm	Nos.	12.0				
10.3	Supply & making of maintenance free Earthing station with the use of 25 mm Dia Copper bonded Rod ( 250 micron) -socpe as above for lighting protection	Nos.	2.0				

Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
10.4	<b>SUPPLY &amp; FIXING OF EARTHING GRID BY COPPER (99.9 % PURE) / HOT DIP GALVANIZED (80-100 Micron) STRIP</b> Providing, fixing, connecting and testing earth grid by using copper/G.I. earth strips for earthing of sub station equipments. The job includes supply of necessary materials such as a copper/G.I. strips, spacers, brass bolts and nuts, washers and other hardware as required to complete the grid. At the joint of two strips a section of 100 mm suitable thickness copper /G.I. strip to be fixed, with brass nuts bolts. i) The job also include fixing & laying of class 'B' G.I. pipe when strip is entering in the building structures etc. ii) Job Done as per drawing shown in execution drawing iii) Earth strip to be fix Nr. Earth pit with 2 nos of Nut & bolt washer & spring washer iv) all other place strip to be weld - 100 % over laping of strip base on size of earth strip & welding all side of strip & apply black bitmnus paint & cotton tap on welding part v) in cable tray near colum earth bus 150 mm long same of earth strip size to be weld with 3 nos of 10 mm hole for future earth connection (as per given in execution drawing) vi) for copper strip brezzing to be done for connection of extantion of earth strip 32 x 6 mm Cu. Strip	Rmt.	100.0				
10.4.1	25 x 3 mm Cu. Strip	Rmt.	150.0				
10.4.2	50 x 6 mm Gl. Strip	Rmt.	300.0				
10.4.3	25 x 6 mm Gl. Strip	Rmt.	250.0				
10.4.4	25 x 3 mm Gl. Strip	Rmt.	100.0				
10.4.5	SITC of 6.0 sq mm single core flexible copper wire of green colour with PVC conduit	Rmt.	50.0				
10.4.6	SITC of 4.0 sq mm single core flexible copper wire of green colour with PVC conduit	Rmt.	150.0				
10.4.7	SITC of 2.5 sq mm single core flexible copper wire of green colour with PVC conduit	Rmt.	150.0				
10.5	<b>Equipotential Bars</b> Equipotential bars - 300 x 50 x 10 mm GI	Nos.	8.0				
10.5.1	Equipotential bars - 300 x 50 x 6 mm copper	Nos.	4.0				
10.5.2	Equipotential bars - 150 x 50 x 6 mm GI	Nos.	5.0				
11.0	<b>SECTION - 11.0 MISCELLANEOUS WORKS</b> SITC of 300 mm dia RCC NP2 class hume pipes with necessary couplers / end plates / sealing / etc complete in existing trench.	Rmt.	30.0				
11.1	Supply, Installation testing and commissioning of GI Floor raceway of 300 x 38 mm of 1.6 mm thickness- 3 Compartment including cutting of civil works if required.	Rmt.	250.0				
11.2	Supply, Installation testing and commissioning of GI Floor raceway of 150 x 38 mm of 1.6 mm thickness- 1 Compartment including cutting of civil works if required.	Rmt.	100.0				
11.3	Supply, Installation testing and commissioning of GI Floor raceway of 100 x 38 mm of 1.6 mm thickness- 1 Compartment including cutting of civil works if required.	Rmt.	100.0				
11.4	SITC of 100 x 50 mm PVC raceway with partition to be fixed on wall with all necessary accessories like bends / couplers / end caps etc complete.	Rmt.	150.0				
11.5	Supply, Installation testing and commissioning of GI floor raceway Cross over junction box of 350 x 350 x 65-75 mm.	Nos.	25.0				
11.6	Supply, Installation testing and commissioning of GI floor raceway outlet junction box of 350 x 350 x 65-75 mm	Nos.	25.0				
11.7	Supply, Installation testing and commissioning of GI floor raceway vertical box	Nos.	3.0				
11.8	Supply, Installation testing and commissioning of GI floor raceway outlet junction box for 150mm ( 65-75 mm D)	Nos.	20.0				
11.9	Supply, Installation testing and commissioning of GI floor raceway outlet junction box for 100 mm ( 65-75 mm D)	Nos.	20.0				
11.10	SITC of IP 65 category Thermo Plastic Material junction boxes with necessary loop in loop out connectors / busbars / internal wiring if required etc. complete. The boxes if required shall be mounted on 9" MS supports which shall be considered in cost.rate cibsidering termianl require up 35 sqmm cable - ampproved make - HENSAL / SECHME / SPELSBERG- SIZE TO BE CHECK WITH VENDOR - NEAR SIZE TO BE CONSIDERING & MENTION IN OFFER 200 x200 x 100 mm	Nos.	25.0				
11.10.1	450 x450 x 150 mm	Nos.	10.0				
11.10.2	600 x600 x 150-200 mm	Nos.	5.0				
11.10.3	125 x 125 x 75 mm	Nos.	150.0				
11.11	Checking of Harmonics in system in full load condition , submitting report and proposing active filter requirement accordingly (ACTIVE	lot	1.0				

Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
11.12	checking of earth resistivity of all earth pits , scope - remove all strip connection from earth pit & get result of earth resistivity , after connection of all earth strip with pit & take reading of earth resistivity	lot	1.0				
11.13	Dismantling of existing metal halide light fixture of 50W to 400W indoor (height 3 mtr to 8 mtr)	no's	316.0				
11.14	Dismantling of existing metal halide light fixture of 70W to 250W outdoor (height 3mtr to 8 mtr)	no's	10.0				
11.15	Dismantling of existing CFL light fixture of 18W to 72W indoor (height 3mtr to 5mtr)	no's	2500.0				
11.16	Dismantling of existing CFL light fixture of 18W to 72W indoor (height 5mtr to 8mtr)	no's	300.0				
<b>12.0</b>	<b>SECTION - 12.0 DG SET AND UPS</b> <b>Supply &amp; installation of D.G. set of 500 KVA</b> with acoustic enclosure, fuel piping, standard fuel tank, D.G. control panel, residential silencer,exhaust piping complete. Installation of DG SET. Scope of work. 1. Unloading 2. Shifting and final location. 3. Fixing/connecting loose points, testing and commissioning in the presence of DG set Engineer.	Nos.	2.0				
12.1	<b>Supply and installation of Exhaust pipe (Size of pipe as per vendors specification) 6 m above</b> building height. Scope Of Work 1. Supporting Steel Structure. Fabrication installation as per DG Vendor Requirement. Insulation of DG exhaust pipe. Insulation up man hight of exhaust pipe. Rain Water Cover on top of the exhaust pipe. steel- fabrication and erection. (Horizontal & Vertical)	Rmt	50.0				
12.2	Supply, installation, testing and commissioning of 60 <b>KVA UPS</b> , Three phase input and three phase output rack type online with isolation transformer with 30mins battery backup-	Nos.	1.0				
12.3	Supply, installation, testing and commissioning of 15 <b>KVA UPS</b> , Three phase input and three phase output rack type online with isolation transformer with 30mins battery backup-	Nos.	2.0				
<b>TOTAL AMOUNT OF ELECTRICAL WORKS RS.</b>							
<b>C</b>	<b>PLUMBING HIGH SIDE</b>						
1.0	<b>HEAT PUMP SYSTEM</b> Supply , installation , testing & commissioning of Micro Processor Controlled aircooled reversible scroll Heatpump delivering actual capacity as per the following parameters duly installed at site. The chiller should be complete with single/multiple hermetic scroll compressors , Four way reversing valve, Thermostatic Expansion Valve, defrosting cycle, Liquid reciever, Copper tube/ aluminum fins air cooled heat exchanger with Axial fans with IP54 protection, braze plate type( SS316) primary heat exchanger, anitvibration rubber mounts with factory assembled with Electrical panel mounted on the chiller including the disconnect switch suitable for 50 Hz, 3 phase 415 volts,ac supply. The vibration isolators shall be shipped alongwith chillers manufacturer's works. Refrigerant circuit to include liquid line solenoid valve, drier filter with replaceable solid cartridge, liquid line sight glass, thermostatic valve, high pressure safety valve, high & lower pressure transducers, high and low pressure switches, liquid receiver etc. The heat pump shall be suitable for operation on Environment friendly refrigerant R 134/ R407c/ R410a and shall come factory charged with refrigerant. Heating Capacity : 116667 Kcal/Hr (100 KW Actual) Air entering in condenser : 7 °C Hot water 'In' : 40 °C Hot water 'Out' : 60 °C Chiller Fouling Factor (FPS) : 0.00025 Maximum IKW : 0.265 KW/KW ( Heating)	Nos	2				
2.0	Providing, installation, testing and commissioning of following insulated pumps suitable for 415 Volts connected with T.E.F.C. induction motor, M.S.channel, base plate 3-phase electric supply complete with vibration isolators, isolating valve on suction and discharge, non return valve on discharge, pressure gauges and dial type thermometer with syphon and stop cock on suction and discharge. The pump shall have mechanical seal. for temperature upto 65 deg. C with the pump SS 304 body and SS 304 impellers Domestic Hot Water Return Pumps Flow - 1.5 L.P.S./ Head - 20 Mtrs / H.P. - 1.0 H.P. (1W+1standby)	Nos.	2				
a)	Valves/Fittings : Ball Valves 40 mm dia.	Nos.	4				
i)	Y-Strainer 40 mm dia.	Nos.	2				
ii)	Check valve 40 mm dia	Nos.	2				
iii)	100mm dia Dial type Pressure gauge	Nos.	4				
iv)	100mm dia Dial type thermometer.	Nos.	2				



Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
2.1	Domestic Hot Water Primary Pumps: Flow - 4.0 L.P.S./ Head - 20 mtrs/ H.P. - 3.0 H.P (1W+1 Standby)	Nos.	2				
b)	Valves/Fittings: Butterfly Valves 80 mm dia	Nos.	4				
i)	Y-Strainer 80 mm dia.	Nos.	2				
ii)	Check valve 80mm dia	Nos.	2				
iii)	100mm dia Dial type Pressure gauge	Nos.	4				
iv)	100mm dia Dial type thermometer	Nos.	2				
3.0	Supply, Installation, Testing & Commissioning Hot Water Tank of 1 No. of 3000 Ltrs each consisting of 1 No. cylindrical closed black steel calorifier tank cum heat exchanger made out of black steel of the required thickness, with all the necessary connections like inlet, outlet, drain/flow off, manhole, handhole, thermowell pockets for temperature indication and thermostats etc. internally treated with anti-corrosive heat resistant black paint and fully glass lined, and shall be totally insulated with 100mm thick fibre glass pads and clad with 20 SWG aluminium sheet duly screwed/riveted. Hot water tanks shall be equipped with electrical back up 18 KW in 3 no. of 6kw each made out of heavy duty stainless steel 304 quality of each element will be of 18 inches long and mounted radially in sets with whirl mixing for efficient and arranged in sets of required capacity. The hot water storage tank should be tested at 5 Kg/ cm <sup>2</sup> . (Double coil)	Each	2				
i)	Cold water inlet Ball Valve 40 mm dia	Nos.	4				
ii)	Check valve in cold water Inlet line 40 mm dia.	Nos.	4				
iii)	Hot Water inlet/outlet secondary side 50 mm dia valve Butterfly.	Nos.	3				
iv)	Check valve in cold water Inlet line 25mm dia.	Nos.	3				
v)	Hot Water outlet connection valve to system 80 mm dia Butterfly.	Nos.	3				
vi)	Hot Water outlet connection valve to system 50 mm dia Butterfly.	Nos.	3				
vii)	Check valve in hot water Inlet line 65 mm dia.	Nos.	3				
viii)	Hot water return inlet 40mm dia.	Nos.	3				
ix)	Tank Drain conn. 50mm dia Butterfly	Nos.	3				
x)	Pressure gauge	Nos.	3				
xi)	Dial type thermometer	Nos.	3				
xii)	25mm dia Pressure relief valve	Nos.	3				
xiii)	M.S.Supporting structure of 3.0 mtr high with access ladder duly painted with red oxide.	KGS	450				
4.0	Supply, Installation and Testing of 200 ltrs Non precharged Closed expansion tank complete with twin make-up water pumps of suitable capacity including one standby, pressure switch, non-return valve, pressure gauges and necessary isolating valves. Closed Expansion Tanks shall be capable of acting as air separator as well as degassing air in the system at atmospheric pressure. Tank should have the ability detect bladder rupture. Tank shall be of Black Steel or similar construction as per the specifications.	Nos	2				
5.0	Supply, Installation, Testing & Commissioning of Dirt Separators with dirt removal as well as magnetic particles using a ferro magnet upto 5 microns as per the specifications on the return water line located at the pump suction or a suitable location as suggested and suitable for water flow mentioned below. The separator should be complete with service valve, non return valve, butterfly valve connection for makeup water inlet, flanges, drain valve etc. of suitable capacity.	Nos.	1				
6.0	Controller: Providing and fixing differential temperature controller for operating the primary circulation pumps.	Nos.	2				
7.0	Providing and fixing cast iron butterfly valves with apoxicoated disc, carbon steel shaft and lever actuator tested to 10 kg/cm <sup>2</sup> . 50mm dia.	Each	4				
a	65 mm dia	Each	4				
b	80 mm dia	Each	4				
8.0	Providing and fixing C.I. Double flanged horizontal dual plate wafer type non return valves PN 1.6 including washer, nuts bolts, 1.5 mm thick compressed asbestos gasket companion flanges as per table "E" complete. 50mm	Each	2				
9.0	Providing and fixing C.I. dirt box strainer with nuts, bolts, rubber insertions etc. complete conforming to IS : 2373 : 50mm	Each	1				

Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
10.0	Providing and fixing brass ball valve full bore type with lever 25mm	Each	4				
a	15mm	Each	2				
11.0	Providing, fixing, testing and commissioning Hot Water GI Heavy Class Pipe with all necessary fittings, i.e. bends, tees, eccentric reducer, Unions, flanges, supports/anchors as required including cutting holes in walls, ceiling and floor making good the same, final connections to equipments complete as per drawings and specifications (within Plant Room or inside areas). 32 mm dia	Rmt	20				
a	40 mm dia	Rmt	25				
b	50 mm dia	Rmt	30				
c	65 mm dia	Rmt	30				
d	80 mm dia	Rmt	40				
12.0	Providing and fixing insulation to hot water pipes, fittings and valves upto 150 mm dia with glass wool 25 mm to 75 mm thick as per specifications tying with Gi chicken wire mesh and covering with cladding with 24 gauge aluminium sheets with 50 mm over lap and fixing with the self taping recessed screws complete. 32 mm dia 25 mm thick insulation	Rmt	20				
a	40 mm dia 50 mm thick insulation	Rmt	25				
b	50 mm dia 50 mm thick insulation	Rmt	30				
c	65 mm dia 50 mm thick insulation	Rmt	30				
d	80 mm dia 50 mm thick insulation	Rmt	40				
13.0	Providing, fixing and testing of 100mm dia Dial type thermometer.	Nos.	2				
14.0	Providing & applying testing kit with all chemicals complete suitable for conducting test on water quality. The test kit shall be suitable to measure TDS, pH & Hardness.	Set	1				
1.0	<b>HW ELECTRICAL PANELS:</b> Supply, installation, testing and commissioning of powder coated compartmentised cubicle panel fabricated out of 2mm thick CRCA sheet steel and suitable for operation on 415 volts, 50Hz, 3 Phase 4 wire AC supply complete with gland plates, lifting hooks, ventilating louvers, busbars, inter connections, earthing and labelling complete as per technical specification and single line diagram. (Panel shall be BMS compatible) (Location : Terrace) <b>Incomer:</b> One (1) No., 100A, 4-POLE MCCB (35KA) <b>Metering:</b> One (1) Set of phase indication lamps with 2A SPMCB. One (1) Set 0-500V, Digital voltmeter with voltmeter selector switch. One (1) Nos., 0-100A, Digital ammeter with ammeter selector switch and required CTs. <b>Bus Bar:</b> One (1) Set. Bus bar 200A, TPN aluminium bus bar of suitable length with colour coded sleeve. <b>Outgoing:</b> Three (3) Nos., 63A 4-Pole MCCB (25 KA) One (1) Nos., 40A 4-Pole MCCB (25 KA) Six (6) No., 16A TPN MCB (10 KA) <b>Starters:</b> Five (6) No. DOL starter of Upto 2HP with single phasing prevention arrangement, O/L relays, ON/OFF / Trip indication lamps and push buttons, potential free contacts for remote operation in each feeder and Auto Manual Selector Switch as required for Return Primary	set	1				
2.0	<b>Cabling:</b> Supply, laying, testing and commissioning of 1100 Volt grade PVC insulated aluminium conductor XLPE armoured cables including the cost of providing required gap between adjacent cables (minimum one cable dia.) and including the cost of providing identification tags, cable trays, stays, hangers etc. complete as per specification, as required. 4C x 16 Sq.mm cable	Rmt	60				
a)	4C x 4 Sq.mm cable	Rmt	100				
3.0	Cable termination : Supplying, receiving, storing, laying, effecting proper connections, testing and commissioning of the following sizes of 1.1 KV grade PVC insulated XLPE Aluminium conductor armoured stranded control cable complete as required and as per specifications. 4C x 16 Sq.mm cable	Nos.	4				
a)	4C x 4 Sq.mm cable	Nos.	10				

Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
4.0	G.I. Earthing Strip/Wire: Supply, installation, testing and commissioning of following sizes of G.I. strip/wire clamped to walls, cable trays, bus ducts, cables in recess or surface etc for equipment/ System / Lightning protection earthing complete as required including inter connection between length at joints, all fixing accessories saddles, clamps etc. and other fixing hardware material as required for proper installation. 25 x 3 mm strip	Rmt	50				
a)	8 SWG wire	Rmt	100				
5.0	Supply and installation of following sizes of perforated GI cable tray made cut of 2 mm thick GI sheet, suspended from the ceiling or fixed on wall/column etc complete with suspenders, runners and fixing hard ware etc. as required. 50 mm x 300mm x 50 mm	Rmt	30				
a)	50 mm x 150 mm x 50 mm	Rmt	30				
1.0	<b>RO TREATMENT (CAPACITY-500LPH)</b> <b>Design, Supply, Fabrication, erection, testing and commissioning of skid horizontally mounted reverse osmosis plant for an output capacity 0.5 m<sup>3</sup>/Hr.</b> The Reverse Osmosis system comprising of the items as under including all other accessories, e.g. Rotometre for blending, ORP meter .Rotometer on output of R.O.PH sensor as shown in sketch necessary frame supports etc. as required for functioning the system complete in all respect. Water supply to the R.O. will be by gravity from terrace overhead tank & the terminal pressure shall be approx. 1.5 kg/sq.cm Inlet TDS< 1500 PPM Outlet TDS < 400 PPM (After Blending) Note: Blending will be 500 LPH Min recovery after blending : 65%	No.	1				
a)	<b>Filter Feed Pump</b> -Supply, installation, testing and commissioning of centrifugal monoblock pump set of required capacity ( 1 working + 1 standby) with cast iron body, ss impeller, mechanical seal connected with T.E.F.C. motor suitable for 440 volts, 3 phase, 50 cycles A.C. supply with 100 mm dial Pressure gauge with gunmetal isolation cocks, valves , fittings & vibration elimination pad etc. complete with M.S. channel base frame nuts and bolts complete in all respect.	set	1				
b)	<b>FRP (Pressure Sand Filter )</b> -Providing and Fixing Vertical pressure sand Bobbin Wound Polyester plus fibreglass filter of required diameter with manhole and cover, air release and all necessary internal fittings, having inlet and outlet of required size and shall include Multiport Valve , standard fittings like pressure gauges on inlet and outlet, sampling cocks, bolts, nuts and rubber gaskets, natural gravel, silica, anthracite etc. complete (tested to 5.5 kg./cm2)	set	1				
c)	<b>FRP (Activated Carbon Filter )</b> -Providing and Fixing Vertical pressure sand Bobbin Wound Polyester plus fibreglass filter of required diameter with manhole and cover, air release and all necessary internal fittings, having inlet and outlet of required size and shall include Multiport Valve , standard fittings like pressure gauges on inlet and outlet, sampling cocks, bolts, nuts and rubber gaskets, natural gravel, Activated carbon ( of iodine value 900-1000 etc. complete (tested to 5.5 kg./cm2).- Make- Astral / Pentair	set	1				
d)	<b>Anti foulant dosing system</b> comprising of electronic diaphragm type dosing pump, HDPE solution tank of 100 ltrs. Capacity, foot valve, dosing valve and interconnecting tubing. The dosing pump should be of capacity 0 - 6 lph against 35 mwx head and should have both frequency and stroke length controls. Make : Asia LMI - Dosing Pump	set	1				
e)	<b>Antiscalant / pH correction dosing system</b> with pump tank and accessories like foot valve cum strainer, dosing valve and interconnecting tubing etc. The system to include an online pH meter , pH sensor of suitable resolution and pH correction dosing assembly in PVC, so that it is possible to manually adjust the pH at the required level and to read the pH of the passing water at all times throughout the operation of the plant. The dosing pump should be of capacity 0 - 6 lph against 35 mwx head and should have both frequency and stroke length controls.Make : Asia LMI - Dosing Pump	set	1				
f)	On line micron filter comprising of 5 micron spun type double layer filter cartridges with proper fixing arrangement in SS 316 housing with inlet and outlet arrangements. Pressure Gauges to be provided at inlet and outlet of the micron filter. The micron filter should be able to give required output with not more than 3 meters loss of head. No. of filter reqd. : 2 ( One working plus one standbye ) with isolation valves at inlet and outlet of filters.	set	1				
g)	<b>High pressure pumps</b> - Vertical monoblock multi stage pumping of required capacity ( 1 working + 1 standby) set of suitable capacity with SS 304 impeller casing and stainless steel 304 impeller and stainless steel shaft, mechanical seal, connected to a TEFC induction motor suitable for 400/440 volts, 3 phase 50 cycles A.C. supply	set	1				
h)	<b>Complete R.O. module</b> comprising of 4" dia x 40" long or as required, brackish water grade spirally wound composite polyamide membranes of approved make, fitted in two or more nos. of FRP housings of approved make, pressure rating of housings to be atleast 1.25 times the operating pressure deigned by the supplier.	set	1				

Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
i)	<b>Post pH correction dosing system</b> ( Alkali dosing to raise pH ) with pump tank and accessories like foot valve cum strainer, dosing valve and interconnecting tubing etc. The system to include an online pH meter , pH sensor of suitable resolution and pH correction dosing assembly in SS, so that it is possible to manually adjust the pH at the required level and to read the pH of the passing water at all times throughout the operation of the plant. The dosing pump should be of capacity 0 - 6 lph against 50 mwc head and should have both frequency and stroke length controls. Plant Permeate output capacity 500 ltr/hr.	set	1				
j)	Chemical cleaning system ( CIP )- CIP for cleaning the R.O. membranes, comprising of one no. vertical SS pump ( similar to high pressure pump ) chemical tank ( Sintex tank chemical grade in pure white HDPE, of capacity 500 Ltrs. min. ), micron filter on discharge side of this pump, isolation valve at inlet, NRV at outlet alongwith necessary piping interconnections and valves as required . The CIP shall be permanently installed with the R.O. Plant and it should be possible to carry out CIP at any time as required.	set	1				
k)	All connecting pipe work as required will be high quality stainless steel grade SS-316 including all accessories etc. on high pressure side complete in all respects as required within the battery limits of inlet point, outlet point and drain point including connections and valves for CIP system therein. The valves at the outlet of R.O. Module ( Both regulation valve and recirculation valve ) to be SS Globe valves flanged connections of required size.	set	1				
l)	Complete instrumentation for the R.O. plant as under Pressure Gauges - Bourdon Type, one no. each at inlet and outlet of each micron filter. ( Four in all ) High Pressure Gauges - Glycerine filled in SS body - at inlet and outlet of R.O. Module.( Preferably mounted on a wet panel along with the rotameters for the purpose of easy readability ) Rate of flow meters - Flow through type In complete SS construction, flanged connections with glass tube OR magnetic type with on line flow sensors and on panel digital display meters, 2 nos. -one each for select and reject streams, 3 if concentrate recirculation is designed. On line pH meters digital type with fine resolution pH sensors- 2 nos. - one each at inlet ( mentioned with antiscalant dosing system above ) and outlet. TDS / Conductivity Meter - Online type : One at the outlet Low and high pressure switches - one each to control the high pressure pump. O.R.P. meter to read the free chlorine in water before entering to Micro Filter. Complete self supporting free standing skid as required to support all R.O. components;all piping and cabling / panels / instruments etc. made with MS square sections of size as required finished with two coats of epoxy paint of approved make . All the components of the R.O. Plant should be firmly and properly secured to the skid and it should be possible to carry out maintenance tasks on the plant without any difficulty and without completely dismantling the plant. Note : Vendor to carry out the analysis of raw water before redesigning the system and suggested any modification if required. <b>NOTE : WE HAVE NOT CONSIDERED OPERATION &amp; MAINTANENCE OF EXISTING 20000 LPH RO PLANT IN THIS BOQ.</b>	lot	1				
1.0	<b>UPGRADATION IN EXISTING PUMPROOM EQUIPMENT</b> <b>Variable Speed Hydro-booster System for Domestic &amp; Flushing water supply :</b> Supply, Installation, testing & commissioning of In-line, vertical multistage, centrifugal clear water pumps with SS-304 casing, S.S 304 impeller and SS-304 shaft, C.I. Base CED coating & head TEFC motor (with mechanical seal) Vendor to submit performance curves and technical catalogue of the proposed model for review and information. Panel mounted microprocessor multi pump controller with large graphical display with VGA 240 x 320 pixels and variable frequency drive (VFD) integrated in a single body or as separate components with pressure sensor transmitter (one dedicated to each pump), diodes to indicate pump ready, pump running and fault and capable to communicate with other controllers following MODBUS-RTU or BACNET Class-2 protocol through RS485 port. System should be capable to compensate for frictional losses at lower flows. All alarms should be displayed in the controller. System should be equipped with dry running protection. Indication of all type of faults / on-off status / electrical parameters shall be available on panel and central IBMS monitors. On-off operation for all pumps shall be available on BMS system.Pre-charged diaphragm pressure vessel with interchangeable membrane, charging connection, connected to outlet header with necessary flanges, gaskets, isolating valves, nuts/bolts etc. complete (size of pressure vessel shall be 380 liters (approx.) or as per manufacturer recommendation). <b>For supplying Flushing water to all areas - P1</b> Capacity per pump - 36.0 m3/hour/ Head - 44 mt / Approx. Elec. Load. - 3.5 KW each pump / Location - Pump Room / 1 Set = 3 Nos. Pump (2 Working + 1 Standby - cascade operation) / Suction head - flooded positive suction	Set	1				

Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
1.2	<b>Supply, Installation, testing &amp; commissioning For supplying Domestic water to all areas - P2</b> Capacity per pump - 36.0 m3/hour / Head - 44 mt / Approx. Elec. Load. - 3.5 KW each pump / Location - Pump Room / 1 Nos. Pump ( 1 Standby - cascade operation) / Suction head - flooded positive suction	Nos	1				
1.3	<b>Supply, Installation, testing &amp; commissioning For supplying soft water to Cooling Tower - P3</b> Capacity per pump - 48.0 m3/hour / Head - 57 mt / Approx. Elec. Load. - 4 KW each pump / Location - Pump Room / 1 Nos. Pump ( 1 Standby - cascade operation) / Suction head - flooded positive suction	Nos	1				
2	<b>Supply, Installation, testing &amp; commissioning Water Supply / Transfer Pumps :</b> In-line, vertical multistage, centrifugal clear water pumps, speed upto 2900 rpm, with SS-304 casing, S.S 304 impeller and SS-304 shaft, C.I. Base CED coating & head, connected to a TEFC motor (with mechanical seal) suitable for 400 / 440 volts, 3 phase 50 cycles A.C. supply with 150 mm dia pressure guage with gunmetal isolation valve, vibration eliminating pads as required, M.S fabricated base plate bolted to cement concrete foundations complete. Vendor to submit performance curves and technical catalogue of the proposed model for review and information. Electrical Starter panels complete with O/L Relay with Single phasing preventer feature, earth leakage relay, ON-OFF and Trip Indicating lamps, contactors contacts for Building Automation System, interlocking, level controller with operational mode as one pump working at low level, both pumps at high level with a hooter alarm and cut off at dry level, cascade operation, working / standby selection, etc. suitable for the motor H.P. as specified below and with provision for remote P.B. on/off complete as required. The on/off operations for all pumps shall be available on central BMS system. <b>RAIN WATER TRANSFER PUMP -P4</b> Capacity per pump - 30.0 m3/hour] / Head - 35.0 m / 1 Set = 2 Nos. pump (1 working+1 standby), cascade operation / Approx. Elec. Load. - 3.0 KW each pump / Location - Pump Room	Set	1				
3	<b>Supply, installation, testing and commissioning of Upgradation of Existing Pumproom piping</b> GI pipes Class 'C' (heavy duty) of approved make conforming to IS 1239-1982 complete with G.I. fittings such as tees, crosses, plugs, sockets, elbows, reducers, unions, sleeve pieces, check nuts etc including jointing with C.I. pipes (wherever required), cutting & making good the walls, floors, R.C.C. work etc. including cutting chases & filling the same, painting the GI pipes with two coats of bitumastic paint, wrapping with one layer of polythene tape. 400 micron thick and applying a final coat of bitumastic paint complete including surface preparation. 50 mm dia	Rmt	5				
3.1	65 mm dia	Rmt	10				
3.2	80 mm dia	Rmt	15				
3.3	100 mm dia	Rmt	15				
4	Dismantling, removing of Existing Pump room GI pipes Class 'C' (heavy duty) of approved make conforming to IS 1239-1982 complete with G.I. fittings such as tees, crosses, plugs, sockets, elbows, reducers, unions, sleeve pieces, check nuts etc 50 mm dia	Rmt	5				
4.1	65 mm dia	Rmt	5				
4.2	80 mm dia	Rmt	5				
4.3	100 mm dia	Rmt	5				
5	Dismantling, removing Existing Pumping System as per below details: Existing HPN Flushing transfer pump set	Set	1				
5.1	Existing HPN one Standby/working domestic water pump	No	1				
5.2	Existing HPN one Standby/working cooling water pump	No	1				
5.3	Existing Rain water submersible transfer Pump	No	1				
	<b>TOTAL AMOUNT OF PLUMBING HIGH SIDE RS.</b>						
<b>D</b>	<b>PLUMBING LOW SIDE</b>						
<b>E)</b>	<b>SANITARY FIXTURES AND C.P. FITTINGS</b> Supply, Installation, testing and commissioning of white vitreous china floor/ wall mounting type European water closet with 'P' / 'S' trap with 6 lit capacity, coupled flushing cistern with dual flush, solid plastic seat cover with lid, C.P. brass hinges and rubber buffers, EPDM sealed WC connector, wall bracket anchoring arrangement complete including cutting and making good the walls and floors wherever required.	Each	8				

Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
1.0	Supply , Installation , testing and commissioning of snow white vitreous china <b>floor/wall mounted wash down water closet and Wash Basin</b> including all fittings and accessories, like one pair mounting brackets, Cistern & seat cover , one nos. hinged rail and two nos. of grab bar 350mm, angle valve, health faucet, complete in all respect. <b>(For Handicapped Toilet)</b>	Each	2				
2.0	Supply , Installation , testing and commissioning of <b>white vitreous china wash basin</b> with CP brass waste assembly, CP brass bottle trap with CP extension piece, wall flanges and rubber adapters for waste connection complete including CI/MS brackets and duly painted, wall flange and union complete, including nuts, washers cutting and making good the walls/ floors wherever required as per direction of Engineer-Incharge: <b>Wash Basin Flat Back Type</b>	Each	4				
2.1	<b>Wash Basin Oval /CounterType</b>	Each	2				
3.0	Supply , Installation , testing and commissioning of Stainless Steel AISI 304 (18/8) kitchen sink as per IS: 13983 with C.I. brackets and stainless steel plug 40 mm, including painting of fittings and brackets, cutting and making good the walls wherever required . <b>Kitchen Sink With Single /Double Drain Type</b>	Each	1				
3.1	<b>Janitor Sink size 610 x 450 x 200mm</b>	Each	1				
4.0	Supply , Installation , testing and commissioning of urinal with electrical operated automatic flushing system and sensor, including f0nt S.S plate 125 x 125mm ch0me sensor with CP brass body, ball valve etc,complete in all respect including cutting and making good the walls wherever required electrical connection complete.	Each	5				
5.0	Supply , Installation , testing and commissioning of 12 mm Toughned Glass urinal partition made from 600mmX900 as per specified shape, including cost of stainless steel branckets(grade 304) with 3M vinyl frosting complete	Each	5				
6.0	Supply , Installation , testing and commissioning of C.P. Brass 190 mm long Shower Arm with wall flange and pressure adjustable Shower Rose complete with all accessories as required and making good the walls wherever required. <b>Shower arm with shower rose</b>	Each	2				
7.0	Supply , Installation , testing and commissioning of CP Brass wall mixer with provison of overhead shower with 115mm long bend pipes on upper size with connecting legs and wall flanges with all accessories as required and making good the walls wherever required.	Each	2				
8.0	Supply , Installation , testing and commissioning of C.P. brass Towel rod - 600mm long with CP screws of approved quality:	Each	2				
9.0	Supply , Installation , testing and commissioning of Chrome Plated <b>Towel Ring</b> complete as directed and specified. <b>For consultants rooms</b>	Each	2				
10.0	Supply , Installation , testing and commissioning of testing and commissioning of CP soap dish of approved make with necessary fixing materials etc., complete.	Each	2				
11.0	Supply , Installation , testing and commissioning of liquid soap dispenser with auto sensor suitable for operation with less than 5 pounds of force complete with spout, shank, and fluid bottle complete in all respects including cutting and making good the walls required.	Each	5				
12.0	Supply , Installation , testing and commissioning of 15 mm dia C.P. angle valve with flanges including 450 mm long copper connecting pipe/ Flexible hose with nuts complete.	Each	40				
13.0	Supply , Installation , testing and commissioning of C.P. brass bib cock of approved quality conforming to IS:8931 :	Each	10				
14.0	Supply , Installation , testing and commissioning of Health faucet with 1 m long C.P. brass flexible pipe of approved quality :	Each	10				
15.0	Supply , Installation , testing and commissioning of C.P. brass robe hook approved quality :	Each	10				
16.0	Supply , Installation , testing and commissioning of Stainless Steel finish toilet paper holder(recess type) with stainless steel roller complete, including cutting and making good the walls wherever required.	Each	10				
17.0	Supply , Installation , testing and commissioning of C.P. Brass single lever basin mixer without popping water with 450 mm long copper pipe and brass nuts complete including & making good the walls / Floors wherever required.	Each	6				
18.0	Supply , Installation , testing and commissioning of C.P. pillar cock of 15mm dia of approved brand as specified and directed.	Each	0				
19.0	Supply , Installation , testing and commissioning of C.P brass Sink Mixer single hole / single lever with swinging casted spout of required size including cutting and making good the wall wherever required.	Each	2				
20.0	Supply , Installation , testing and commissioning of self contained pressure type water coolers suitable for operation on 230 voltage - 10% single phase AC supply and generally confirming to the requirements of IS :1476/78 having following nominal cooling capacity at an ambient temperature of 30 deg.c and drinking water inlet temperature of 35 deg c and drinking water outlet temperature of 13.5 deg.c complete with compressor over head protector, thermostat and steel tank. <b>100 Ltr. Capacity</b>	Each	2				

Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
21.0	Supply , Installation , testing and commissioning of solid state, no touch operating, <b>fully hygienic hand drier</b> of approved shade with single blower, with time delay, summer & winter control, music while drying, volume ON / OFF controls including providing necessary brackets, cable from drier to Plug, Plug top key and lock etc, complete as required.	Each	2				
22.0	Supply , Installation , testing and commissioning of vertical / horizontal storage type hot water heater fixed to wall with anchor bolts & nuts, 20mm CP brass cock and 20mm non return valve complete including making connection with 15 mm dia CP connecting pipe on Inlet and Outlet, suitable length of power cable and 15A plough (for kitchen & Toilets). 15 Ltr. Cap	Each	1				
22.1	25 Ltr. Cap	Each	1				
<b>F)</b>	<b>INTERNAL DRAINAGE</b> Providing and fixing cast iron hubless soil,waste and vent pipe conforming to I.S: 15905 or EN 877 including all fittings e.g.bends,junction, offsets, access pieces, jointing with SS coupling with gasket with supporting clamps for wall in shaft and pipes at ceiling with brackets and support including cutting and making good where required complete in all respects. ) <b>(Pipes for soil , waste , vent &amp; rain water vertical shaft)</b> 75 mm dia	RM	50				
1.1	100 mm dia	RM	100				
1.2	150 mm dia	RM	100				
2.0	Providing and fixing cast iron hubless soil,waste and vent pipe conforming to I.S: 15905 or EN 877 including all fittings e.g.bends,junction, offsets, access pieces, jointing with SS coupling with gasket with supporting clamps for wall in shaft and pipes at ceiling with brackets and support including cutting and making good where required complete in all respects. <b>(Pipes for internal drainage)</b> 75 mm dia	RM	75				
2.1	110 mm dia	RM	200				
2.2	150 mm dia	RM	400				
3.0	Providing and fixing in position G.I. pipe and fittings of heavy class (c) conforming to IS:1239 (for waste pipe from individual fixtures to floor trap / floor drain & vent pipe) Including fixing at wall / ceiling level supported by galvanized clamps and hangers etc., cutting chases in wall and filling with 1:1 cement mortar, painting two coats of anti-corrosive bitumastic paint over one coat of primer wapping with one layer of 400 microne sheet and finally one apply one coat of anti-corrosive paint. 32 mm dia	RM	150				
3.1	40 mm dia	RM	80				
3.2	50 mm dia	RM	80				
4.0	Providing and fixing G.I. inlet hopper with two or three inlets fittings to receive waste pipes from fixtures waste. The hopper shall be fabricated from 100 mm dia upto 600 mm long G.I. heavy class pipe and welded G.I. sockets, fixed to C.I. trap with lead joint and support through galvanized steel support from slab or set in cement concrete mix 1:2:4 complete as required. The hopper shall be hot dip galvanized after fabrication, painted with two coats of anti-corrosive paint from inside & outside and fixed to CI trap / pipe with drip seal joint.	Each	100				
5.0	Providing and fixing CI P OR S trap (FLOOR TRAP) of self cleaning design with screwed down or hinged grating without vent arm complete including cost of cutting and making good the walls and floors.	Each	100				
6.0	Providing & fixing 100 mm x 50 mm G.I.waste with reducing elbow & nipple cutting chases, the floor/slab, repairs complete as required and connection to GI/CI waste pipe.(floor drain)	Each	20				
7.0	Providing ,Fixing, Testing & Commissioning of <b>Heavy class S.S. grating</b> with Cockroach proof S.S. strainer of approved design including setting in floor with cement motor to match with floor finish as per architect requirement suitable for waster and FT. 125 mm x 125 mm <b>(for floor trap)</b>	Each	20				
7.1	100 mm x 100 mm <b>(for floor drain)</b>	Each	100				
8.0	Providing and fixing <b>M.S structural work fabricated</b> from standard sections e.g M.S rounds, angles, plates, channels, R.S. joints, GI clamps including cutting to size, drilling, welding, insert plates, dash fasteners of required specification in R.C.C. structural masonry members as directed by Engineer- in- charge including cutting and making good the walls and floors and painting with two coats of enamel paint over primer coat after rubbing and cleaning for pipe supports, clamps, M.S ladder and Manhole tank covers etc. wherever required .	KG	150				

Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
<b>G)</b>	<b>INTERNAL WATER SUPPLY(COLD AND HOT WATER SUPPLY)</b> Providing and fixing PE-X/A plastic pipe system, Certified complete with Red Brass / PPSU fittings with SC-Contur such as sockets, bends, elbows, tees, reducers, unions, flanges, clamps / structural steel supports,hangers, etc. necessary adapters for PB / copper to CP fittings, jointing, sundries, cutting holes in walls / floors / slabs and making good including wrapping with ploythene sheet tape etc. complete for the following nominal bore(NB): Concealed work, including cutting chases and making good the walls etc. <b>exposed on wall, ceiling</b> 15 mm dia	RM	1000				
1.1	20 mm dia	RM	450				
1.2	25 mm dia	RM	350				
1.3	32 mm dia	RM	250				
1.4	40 mm dia	RM	150				
1.5	50 mm dia	RM	100				
1.6	65 mm dia	RM	20				
2.0	Providing and fixing Stainless Steel pipe and fitting of grade AISI 316 as per JIS standard 3448 complete with press type fitting (fitting shall be paid for separately) i/c fixing of the pipe with clamps at 1.00m spacing and also including cutting of chases and making good the walls including testing of joints complete as per direction of Engineer -in-charge. (The pipe length inserted in the fitting shall not be measured for ayment) <b>(for RO Purpose)</b> 15 mm dia	RM	50				
2.1	20 mm dia	RM	10				
2.2	25 mm dia	RM	10				
2.3	32 mm dia	RM	10				
3.0	Providing and fixing PE-X/A plastic pipe system, Certified complete with Red Brass / PPSU fittings with SC-Contur such as sockets, bends, elbows, tees, reducers, unions, flanges, clamps / structural steel supports,hangers, etc. necessary adapters for PB / copper to CP fittings, jointing, sundries, cutting holes in walls / floors / slabs and making good including wrapping with ploythene sheet tape etc. complete for the following nominal bore(NB):Internal work - exposed in shafts 15 mm dia	RM	10				
3.1	20 mm dia	RM	10				
3.2	25 mm dia	RM	20				
3.3	32 mm dia	RM	20				
3.4	40 mm dia	RM	20				
3.5	50 mm dia	RM	20				
3.6	65 mm dia	RM	20				
3.7	80 mm dia	RM	10				
4.0	Providing, Fixing, testing & Commissioning of <b>full way lever operated forged brass Ball valve</b> of brass body with forged brass hard chromeplated steel ball tested to a pressure rating of PN 16 with threaded / flanged joints complete with nuts, bolts, gaskets, washers union etc. 15 mm dia	Each	10				
4.1	20 mm dia	Each	10				
4.2	25 mm dia	Each	5				
4.3	32 mm dia	Each	10				
4.4	40 mm dia	Each	5				
4.5	50 mm dia	Each	5				
5.0	Providing & fixing <b>C.I butterfly valve</b> (upto 150mm dia with hand lever operation & above with gear box operation) conforming to IS:13095. Tested to a pressure not less than 16 Kg/Sq.cm. Including rubber gasket, flanges, nuts, bolts, washers & painting complete as required. 65 mm dia	Each	2				
5.1	80 mm dia	Each	2				
5.2	100 mm dia	Each	2				
6.0	Providing and fixing proprietary fire proof outer <b>mechanical protected nitrile rubber insulation</b> as per manufacturers specification and approved by Project Manager / Consultnats. 15 mm dia (9 mm thickness)	RM	600				
6.1	20 mm dia (9 mm thickness)	RM	180				
6.2	20 mm dia (13 mm thickness)	RM	200				



Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
6.3	25 mm dia (13 mm thickness)	RM	130				
6.4	32 mm dia (13 mm thickness)	RM	30				
6.5	40 mm dia (13 mm thickness)	RM	10				
6.6	50 mm dia (13 mm thickness)	RM	10				
7.0	Providing and fixing <b>water meter station</b> with direct reading dial in KL with all integral parts of gun metal or brass with necessary fitting such as threaded pieces, unions pressure guage and isolation cock, flanges piece for future removal, flanges/unions complete with all necessary testing charges and obtaining test cetificates from municipal authorities. 50 mm - Kitchen Water Supply (Hot & cold)	no	2				
7.1	40 mm - RO water supply	no	1				
8.0	Providing, fixing, jointing and testing, heavy quality gun metal or brass <b>non return valve</b> confirming to IS 778, with screwed / flanged ends, 16 kg/m2 of approved make, on water supply lines of the following nominal bore (NB) size: 32 mm	no	4				
8.1	25 mm	no	10				
8.2	20 mm	no	20				
8.3	15 mm	no	30				
9.0	Providing, fixing and testing, heavy quality <b>Pressure reducing valves</b> of approved make as approved,including flanges / unions, nuts, bolts, washers, Pressure guages, etc. complete by the Architect and Engineer-in-charge for water supply lines of the following nominal bore (NB) size: The upstream water pressure may be upto 7 kg/cm2g max. and downstream pressure min. 1 kg/cm2g. 40 mm	no	2				
9.1	32 mm	no	2				
9.2	25 mm	no	4				
9.3	20 mm	no	4				
<b>H)</b>	<b>EXTERNAL DRAINAGE &amp; WATER SUPPLY</b> Providing, laying, jointing and testing heavy quality DWC under ground application pipes with ring fit / self it fittings of SN4 class of approved make laid to required alignment and slope trenches inclusive of excavation in all soil types, bailing or pumping out water from trenches, shoring, whenever necessary testing, refilling, in layers, ramming & consolidation, removing away the surplus earth & spoils, dumping it on site or carting away to lead of 100 meters as directed incl. cement concrete bedding 1:3:6, 150mm thick. (depth upto 1500 mm), 100 mm dia	RM	20				
1.1	150 mm dia	RM	120				
1.2	200 mm dia	RM	20				
2.0	Providing, fixing, jointing and testing <b>PVC gully trap</b> , of 150 mm. dia. inlet and 100 mm. outlet, including excavation in all soil types, bailing or pumping out water from trenches, shoring whenever necessary testing, refilling, in layers ramming & consolidation, removing away the surplus earth & spoils, dumping it on site or carting away to lead of 100 meters as directed, incl. embedding the trap in CC 1:2:4, construction of brick masonry chamber, internal clear size 300 mm. x 300 mm., in brick work 230 mm. thick, in CM 1:4, plastering inside, outside and all exposed surfaces with CM 1:3, 12 mm. thick, providing, fixing CI / pvc frame and cover 300 x 300 mm., weighing together not less than 12.5 Kg., painting of all CI items with 3 coats of approved bitumastic paint, etc. complete.	no	6				
3.0	Providing and fixing <b>PVC Sewer (intercepting) trap</b> , of 150 mm. x 150 mm. size with cleaning eye cap and metal stopper chain, set in CC 1:2:4 etc., complete in last manhole including vent / fresh air pipe.	no	8				
4.0	Constructing brick masonry <b>rectangular manhole</b> in cement mortar 1:4 (1 cement : 4 coarse sand) RCC top slab with 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size), foundation concrete 1:4:8 mix (1 cement : 4 coarse sand : 8 graded stone aggregate 40mm nominal size) inside plastering 12mm thick with cement mortar 1:3 (1 cement : 3 coarse sand) finished with floating coat fo neat cement and making channels in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nminal size) finished with a floating coat of neat cement complete as per standard design. Inside size 90x80cms and 45cms deep including CI cover with frame (light duty) 455x610mm internal diamensions total weight of cover and frame to be not less than 38 kg (weight of cover 23 kg and weight of frame 15kg). With FPS bricks of class designation 75	Each	7				
4.1	Extra for depth for manhole 900 X 800 mm With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	Metre	7				

Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
5.0	Providing and installation Standard D Grease Separator NS 10 based on DIN EN 1825 and DIN 4040. With direct disposal, manufactured from Polyethylene. No metallic components in chamber. For free standing installation in frost free areas, with integrated sludge trap and sloped walls for quick and efficient disposal, polyethylene quick release odor tight covers, with direct disposal hook up pipe for sludge and grease trap disposal, no more than 3 liters of sludge remains after disposal, disposal flange DN 65, PN 10 (DIN 2501) Storz-B-coupling 2.5 inch for disposal truck connection, inlet/outlet fits PE-HD pipe (DIN 19537) and HT pipe (DIN 19560), PP or AS. Version: Right side (can be changed to left side version by exchanging inlet and outlet. Inspection window with cleaning wiper Sludge trap capacity: 1000 liter, Total separator capacity: 900 liter, Grease storage capacity: 400 liter Inlet / Outlet: DN 100 (DA 160 mm)	EACH	1				
6.0	Earth Work in Excavation of required width for water supply pipes including excavation for sockets and dressing of sides, ramming of bottom depth upto 1.5 m including getting out the excavated soil and then backfilling the soil as required in layer not exceeding 20 cms in depth including consolidating each deposited layers by ramming, watering etc. and disposing of surplus excavated soil as directed within a lead of 50 m. for all kinds of soil. Pipe up to 80 mm dia (Assumed)	rmt	100				
7.0	Providing and filling sand of grading zone V or coarser grade around the water supply pipes and about 300 mm above the pipe surface in the external work. Pipe up to 80 mm dia (Assumed)	rmt	100				
<b>TOTAL AMOUNT OF PLUMBING LOW SIDE RS.</b>							
<b>E</b>	<b>FIRE FIGHTING SYSTEM</b>						
<b>A</b>	<b>Hydrant System</b> Supplying, installing, testing and commissioning of M.S. Pipes confirming to IS 1239 Pt - I Heavy grade with painting, suitable type of supports / Pedestals, anchor fasteners, bolts nuts, clamps, "U" bolts, fittings such as Reducers, Tees, elbows, flanges. Including cutting, Welding, fixing in / on walls, ceiling by using suitable supports etc. The quoted rate shall also include for chasing / chipping walls, and making them good with filler material and finished in cement mortar etc. complete. 150mm nominal dia	2520	mtr				
a	100mm nominal dia	12	mtr				
b	80mm nominal dia	60	mtr				
c	50mm nominal dia	6	mtr				
d	25mm nominal dia	60	mtr				
1	Supplying, installing, testing and commissioning of buried M.S. Pipes confirming to IS 1239 Pt - I Heavy grade with suitable type of supports, fittings such as Reducers, Tees, elbows, flanges. Including cutting, Welding as per drawings. The rate quoted should include with anti corrosive treatment with 4 mm thick polymer corrosion resistant tape, primer as per IS 10221, overlap shall be 15mm minimum. 150mm nominal dia	90	mtr				
a	100mm nominal dia	12	mtr				
b	80mm nominal dia	30	mtr				
2	Hume pipe class - NP2 300 mm dia	20	Rmt.				
a	250 mm dia	10	Rmt.				
3	Supplying, Installing, testing and commissioning CI butterfly valves as per BS 5155 ( PN 16) slim seal standard lever operated / gear operated type with required flanges, nuts, bolts etc. complete. 200mm nominal dia	1	Nos.				
a	150mm nominal dia	4	Nos.				
b	100mm nominal dia	1	Nos.				
c	80mm nominal dia	1	Nos.				
d	50mm nominal dia	1	Nos.				
4	Supplying, installing, testing and commissioning of C.I. Non-return valves as per IS:5312( PN 16) swing check type with required flanges, nuts, bolts and gaskets etc. complete. 200 mm nominal dia	1	Nos.				
a	150 mm nominal dia	1	Nos.				
b	100 mm nominal dia	1	Nos.				
c	80 mm nominal dia	1	Nos.				

Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
d	50 mm nominal dia	1	Nos.				
5a	Supplying, installing, testing and commissioning of yard hydrant comprising of the following, Single headed hydrant valve as per IS 5290, made of Gun Metal with 63 mm dia instantaneous out & 80 mm dia fanged inlet inlet, Blank cap , chain and hand wheel etc complete.	2	Nos.				
	Supplying, installing, testing and commissioning of S.S. orifice plate of 6 mm thk. For single hydrant	2	Nos.				
5b	Supplying, installing, testing and commissioning of internal hydrant comprising of the following, Single headed hydrant valve as per IS 5290, made of Gun Metal with 63 mm dia instantaneous out & 80 mm dia flanged inlet inlet, Blank cap , chain and hand wheel etc complete.	8	Nos.				
1	Supplying, installing, testing and commissioning of S.S. orifice plate of 6 mm thk. For Single hydrant	8	Nos.				
6	Supply, erection, testing & commissioning of Gun Metal Branch pipe with nozzles	10	Nos.				
7	Supply, erection, testing & commissioning of 63 MM x 15 Mtrs. Long RRL hose pipe complete with pair of GM couplings.	20	Nos.				
8	Supply, erection of M.S. Hose cabinet stand mounted type fabricated out of M.S. sheet of 16 swg. with glass fronted ( 4mm thick glass with rubber beeding) door and size of the cabinet shall be 600mm x 750 mm x 250 mm Quoted rate shall be includes suitable all fasteners etc, and cabinet shall be powder coated of approved colour both inside and out side. Hose cabinet for external hydrant shall have weather proof enclosure	10	Nos.				
9	Supply, erection, of Fire duct Shutter fabricated out of M.S. sheet and frame, door shall be 900mm x 1500 mm min. & fixed with 4 mm thick Glass, suitable Rubber beeding and Locking arrangement. Quoted rate shall be includes all fasteners etc, and complete shutter shall be powder coated of approved colour both inside and out side.	2	Nos.				
10	Supply, erection, testing & commissioning of Hose reel drum of swinging type with 25 mm dia Rubber braided hose of 36.5M. length with Gate valve (on upstream) and Shut off nozzle, complete.	18	Nos.				
11	Supply, erection, testing & commissioning of Gun metal Air Purge Valve with ball valve & other accessories 25 mm dia BSP male threaded	6	Nos.				
12	1750 LPM Water Monitors with Isolation Valve	2	Nos.				
<b>B</b>	Supplying, installing, testing and commissioning of M.S. Pipes conforming to IS 1239 Pt - I Heavy grade with painting, suitable type of supports ( Shall be fabricated by M.S. Channel / Angle / Flat for above 50 mm dia), anchor fasteners, bolts nuts, clamps, "U" bolts, fittings such as Reducers, Tees, elbows, flanges. Including cutting, Welding, fixing in / on walls, ceiling by using suitable supports etc, The quoted rate shall also include for chasing / chipping walls, and making them good with filler material and finished in cement mortar etc. complete. 150 mm dia	36	Rmt.				
a	100 mm dia	90	Rmt.				
b	80 mm dia	66	Rmt.				
c	65 mm dia	120	Rmt.				
d	50 mm dia	42	Rmt.				
e	40 mm dia	24	Rmt.				
f	32 mm dia	24	Rmt.				
g	25 mm dia	312	Rmt.				
1	Supplying, Installing, testing and commissioning CI butterfly valves as per BS 5155 ( PN 16) slim seal standard lever operated / gear operated type with required flanges, nuts, bolts etc. complete. 150 mm dia ( Butterfly Valves)	2	Nos.				
a	100 mm dia( Butterfly Valves)	1	Nos.				
b	80 mm dia( Butterfly Valves)	1	Nos.				
c	65 mm dia( Butterfly Valves)	1	Nos.				
2	Supply and installation of bourdon type Pressure gauges of suitable range( 0 to 21 Kg/ cm2) with Ball valves, siphon, Fittings like unions / collars / reducers etc.	3	Nos.				
3	Supplying, installing, testing and commissioning flow switch on sprinkler distribution header on each floor and shall be connected to fire alarm panel through cable. Cable shall be measured separately Flow switch shall be "UL" Listed and FM Global approved. 150 mm dia	1	Nos.				
a	100 mm dia	1	Nos.				
b	80 mm dia	1	Nos.				

Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
c	65 mm dia	1	Nos.				
d	50 mm dia	1	Nos.				
4	Supplying, installing, testing and commissioning conventional Sprinkler quartzoid bulb type with screwed end connection Sprinklers shall be UL Listed / FM approved with Chrome finished. 15 mm dia - Rating 57°C ( Pendent Type ) K-5.6	150	Nos.				
a	15 mm dia - Rating 79°C ( Pendent Type ) K-5.6	10	Nos.				
b	15 mm dia - Rating 57°C ( Upright Type ) K-5.6	100	Nos.				
5	Supply, erection, testing & commissioning of S.S Flexible Pipes for Sprinkler Connection 1500 mm long	10	Nos.				
a	1000 mm long	150	Nos.				
b	750 mm long	10	Nos.				
6	Gun metal Air Purge Valve with ball valve & other accessories 25 mm dia BSP male threaded	2	Nos.				
7	Supplying, installing, testing and commissioning of S.S. orifice plate of 6 mm thk. For Sprinkler Branches 150 mm dia	1	Nos.				
b	100 mm dia	1	Nos.				
c	80 mm dia	1	Nos.				
d	65 mm dia	1	Nos.				
8	Supplying, installing, testing and commissioning of 25mm dia <b>Inspection and Testing assembly</b> with GM sight glass, GM isolation, by pass valves and connected to drain line complete ( excluding the cost of drain pipe)	4	Nos				
9	Sprinkler Alarm Valve Trim with all accessories. ( Alarm Valve is excluded )	1	Set				
<b>C</b>	<b>Miscellaneous Work</b> Civil Work Excavation, Backfilling of trenches for underground mains, S.V. Chamber, Inspection & Welding pits, etc. (in dry area): Soft soil	200	M <sup>3</sup>				
<b>D</b>	<b>Supplying, installing and commissioning Portable Fire extinguishers of following type &amp; capacity.</b> Carbon-di- oxide type fire extinguisher of 4.5 kgs. Capacity, CO2 gas filled in brand new seamless cylinder with powder coated finish, made out of Manganese steel, with wheel type valve, discharge nozzle, bend & horn, wall mounting bracket etc. complete, confirming to IS: 15683.	5	Nos.				
1	ABC powder type fire extinguisher of 6 Kgs. Capacity, with initial filling in brand new cylinder with powder coated finish, fitted with Gun metal union, high pressure CO2 gas cartridge, discharge hose, floor trolley type / wall mounting bracket etc. complete, confirming to IS:15683.	5	Nos.				
1A	ABC powder type fire extinguisher of 2 Kgs. Capacity, with initial filling in brand new cylinder with powder coated finish, fitted with Gun metal union, high pressure CO2 gas cartridge, discharge hose, floor trolley type / wall mounting bracket etc. complete, confirming to IS:15683.	5	Nos.				
2	Mechanical Foam type fire extinguisher 9Lts. Capacity, with initial filling in brand new cylinder with powder coated finish, fitted with Gun metal union, high pressure CO2 gas cartridge, hose and ABS type branch pipe and wall mounting bracket etc. complete, confirming to IS: 15683.	2	Nos.				
3	Fire buckets round bottom type enamel painted, white inside & Red out side and Letter "FIRE" in black out side and handle with mounting bracket.	5	sets				
<b>E</b>	<b>SIGNAGES</b> <b>Supply, erection of emergency exit signages (To be approved by EIC)</b> Emergency Exit (5"X12")	30	Nos.				
1	Fire exit (5"X12")	30	Nos.				
2	Co2 fire extinguishers (8"X16")	30	Nos.				
3	DCP fire extinguishers (8"X16")	2	Nos.				
4	ABC fire extinguishers (8"X16")	30	Nos.				
5	Mechanical foams fire extinguishers (8"X16")	2	Nos.				
6	Fire Lift (4"X12")	5	Nos.				
7	In case of fire do not use lift, use staircases (8"X8")	5	Nos.				
8	Fire hose reel. (8"X8")	20	Nos.				
9	Manual call point. (4"X4")	20	Nos.				

Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
10	Fire alarm panel. (4"X4")	2	Nos.				
11	Fire hydrant (4"X4")	20	Nos.				
12	Route Markers (10 mtrs rolls)	2	Nos.				
13	Letters and Nos. (8"X3")	30	Nos.				
<b>F</b>	<b>Providing necessary design calculations, shop drawings, As Built Drgs and obtaining Clearance from statutory agencies</b>	1	LS				
<b>G</b>	<b>FIRE TRACE SYSTEM FOR ELECTRICAL PANELS</b>	1	NO				
	PCC-1 ( 9800 X 1200 X 2350 ) with 42 Nos compartments. Maximum Size of Compartment - 900 mm X 900 mm.						
1	PCC-2 ( 8700 X 1200 X 2350 ) with 37 Nos compartments. Maximum Size of Compartment - 900 mm X 900 mm.	1	NO				
2	APFC PANEL-1 (4600 X 750 X 2250 ) with 24 Nos compartments. Maximum Size of Compartment - 900 mm X 1050 mm.	1	NO				
3	APFC PANEL-2 (4600 X 750 X 2250 ) with 24 Nos compartments. Maximum Size of Compartment - 900 mm X 1050 mm.	1	NO				
4	SERVICE BUILDING POWER PANEL ( 2600 X 450 X 2100 ) with 18 Nos compartments. Maximum Size of Compartment - 500 mm X 600 mm.	1	NO				
5	CHILLER PANEL-1 ( 2800 X 1000 X 2300 ) with 13Nos compartments. Maximum Size of Compartment - 900 mm X 800 mm.	1	NO				
6	CHILLER PANEL-2 ( 3400 X 2200 X 1000 ) with 14 Nos compartments. Maximum Size of Compartment - 1050 mm X 650 mm.	1	NO				
7	PRIMARY PUMP PANEL ( 3800 X 450 X 2100 ) with 20 Nos compartments. Maximum Size of Compartment - 600 mm X 600 mm.	1	NO				
8	SECONDARY PUMP PANEL-1 ( 4800 X 450 X 1800 ) with 10 Nos compartments. Maximum Size of Compartment - 1800 mm X 600 mm.	1	NO				
9	SECONDARY PUMP PANEL-2 ( 1100 X 450 X 1800 ) with 3 Nos compartments. Maximum Size of Compartment - 1800 mm X 350 mm.	1	NO				
10	EXHIBITION CENTRE POWER PANEL-1 ( 3000 X 450 X 2300 ) with 20 Nos compartments. Maximum Size of Compartment - 700 mm X 900 mm.	1	NO				
11	EXHIBITION CENTRE POWER PANEL-2 ( 3500 X 450 X 2300 ) with 24 Nos compartments. Maximum Size of Compartment - 700 mm X 900 mm.	1	NO				
12	EXHIBITION CENTRE LIGHTING PANEL-1 ( 2000 X 450 X 1700 ) with 12 Nos compartments. Maximum Size of Compartment - 300 mm X 500 mm.	1	NO				
13	EXHIBITION CENTRE LIGHTING PANEL-2 ( 2000 X 450 X 1700 ) with 12 Nos compartments. Maximum Size of Compartment - 300 mm X 500 mm.	1	NO				
14	EXHIBITION CENTRE LIGHTING PANEL-3 ( 2000 X 450 X 1700 ) with 12 Nos compartments. Maximum Size of Compartment - 300 mm X 500 mm.	1	NO				
15	EXHIBITION CENTRE LIGHTING PANEL-4 ( 2000 X 450 X 1700 ) with 12 Nos compartments. Maximum Size of Compartment - 300 mm X 500 mm.	1	NO				
16	CONVENTION CENTRE POWER PANEL-4 ( 4500 X 450 X 2300 ) with 33 Nos compartments. Maximum Size of Compartment - 900 mm X 900 mm.	1	NO				
17	UPS O/G PANEL ( 1800 X 450 X 1700 ) with 12 Nos compartments. Maximum Size of Compartment - 800 mm X 600 mm.	1	NO				
18	LIGHTING PANEL-3 ( 2200 X 450 X 2000 ) with 20 Nos compartments. Maximum Size of Compartment - 600 mm X 600 mm.	1	NO				
19	PHOTO GALLERY MAIN PCC-1 ( 4300 X 1000 X 2300 ) with 23 Nos compartments. Maximum Size of Compartment - 950 mm X 750 mm.	1	NO				
20	CENTRAL VISTA MAIN LT PANEL ( 3200 X 600 X 2100 ) with 15 Nos compartments. Maximum Size of Compartment - 450 mm X 600 mm.	1	NO				
21	CENTRAL VISTA LIGHTING PANEL ( 2100 X 450 X 1700 ) with 10 Nos compartments. Maximum Size of Compartment - 600 mm X 500 mm.	1	NO				
22	COMMON AREA DISTRIBUTION PANEL ( 2800 X 450 X 2100 ) with 15 Nos compartments. Maximum Size of Compartment - 500 mm X 600 mm.	1	NO				
23	SHOPS MAIN PANEL-2 ( 2000 X 450 X 2100 ) with 12 Nos compartments. Maximum Size of Compartment - 500 mm X 600 mm.	1	NO				
24	PHE PANEL PHOTO GALLERY AND FOOD COURT ( 1200 X 450 X 1800 ) with 8 Nos compartments. Maximum Size of Compartment - 500 mm X 600 mm.	1	NO				
25	FOOD COURT AREA UPS I/P PANEL ( 1200 X 450 X 2000 ) with 6 Nos compartments. Maximum Size of Compartment - 600 mm X 600 mm.	1	NO				
26	COMMON AREA UPS PANEL ( 2000 X 450 X 2200 ) with 20 Nos compartments. Maximum Size of Compartment - 450 mm X 500 mm.	1	NO				
27	MAIN PCC-1 FOR FOOD COURT ( 4400 X 1000 X 2300 ) with 23 Nos compartments. Maximum Size of Compartment - 800 mm X 800 mm.	1	NO				
28	FOOD COURT MAIN LT PANEL ( 2600 X 600 X 2100 ) with 20 Nos compartments. Maximum Size of Compartment - 450 mm X 500 mm.	1	NO				
29	FOOD COURT LIGHTING PANEL ( 1500 X 450 X 1700 ) with 12 Nos compartments. Maximum Size of Compartment - 450 mm X 450 mm.	1	NO				
30	FOOD COURT GROUND FLOOR POWER PANEL ( 2000 X 450 X 1500 ) with 12 Nos compartments. Maximum Size of Compartment - 500 mm X 600 mm.	1	NO				
31	RESTAURANT MAIN PANEL ( 1800 X 450 X 1800 ) with 10 Nos compartments. Maximum Size of Compartment - 500 mm X 600 mm.	1	NO				
32	MAIN PHE PANEL ( 1300 X 450 X 2000 ) with 10 Nos compartments. Maximum Size of Compartment - 600 mm X 600 mm.	1	NO				
33	FIRE MCC-1 ( 2800 X 800 X 1800 ) with 11 Nos compartments. Maximum Size of Compartment - 750 mm X 600 mm.	1	NO				
34	RAIN WATER PUMP PANEL (2000 X 450 X 2200 ) with 13 Nos compartments. Maximum Size of Compartment - 500 mm X 350 mm.	1	NO				
35	PHE PANEL-1 ( 4500 X 600 X 2175 ) with 26 Nos compartments. Maximum Size of Compartment - 600 mm X 600 mm.	1	NO				
36	DG SYNCH PANEL ( 5000 X 1000 X 2200 ) with 6 Nos compartments. Maximum Size of Compartment - 900 mm X 900 mm.	1	NO				
37	MAIN PCC-3 ( 8000 X 1000 X 2200 ) with 14 Nos compartments. Maximum Size of Compartment - 900 mm X 900 mm.	1	NO				
38	APFC PANEL ( 3800 X 750 X 2250 ) with 18 Nos compartments. Maximum Size of Compartment - 900 mm X 900 mm.	1	NO				
39	BOH AREA MAIN PANEL ( 2000 X 450 X 2200 ) with 10 Nos compartments. Maximum Size of Compartment - 450 mm X 600 mm.	1	NO				
40	CONVENTION AREA MAIN PANEL ( 2500 X 450 X 2200 ) with 15 Nos compartments. Maximum Size of Compartment - 600 mm X 600 mm.	1	NO				

Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
41	FOOD COURT AREA MAIN PANEL ( 5000 X 1000 X 2200 ) with 18 Nos compartments. Maximum Size of Compartment - 800 mm X 900 mm.	1	NO				
42	HVAC PANEL ( 4000 X 1000 X 2200 ) with 12 Nos compartments. Maximum Size of Compartment - 800 mm X 900 mm.	1	NO				
43	EXISTING HT PANEL ( 2500 X 2000 X 2200 ) with 6 Nos compartments. Maximum Size of Compartment - 600 mm X 1100 mm.	1	NO				
44	PROPOSED HT PANEL-1 ( 2500 X 2000 X 2200 ) with 6 Nos compartments. Maximum Size of Compartment - 600 mm X 1100 mm.	1	NO				
45	PROPOSED HT PANEL-2 ( 1200 X 2000 X 2200 ) with 2 Nos compartments. Maximum Size of Compartment - 600 mm X 1100 mm.	1	NO				
<b>H</b>	<b>Dismantling of Existing Pipes</b> 150 mm dia	200	NO				
a	100 mm dia	50	NO				
b	80 mm dia	60	NO				
c	65 mm dia	50	NO				
d	50 mm dia	100	NO				
e	40 mm dia	100	NO				
f	32 mm dia	100	NO				
g	25 mm dia	200	NO				
<b>1</b>	<b>Dismantling of Existing Butterfly / Non Return / Ball Valves</b> 150 mm dia	5	NO				
a	100 mm dia	5	NO				
b	80 mm dia	5	NO				
c	65 mm dia	5	NO				
d	50 mm dia	10	NO				
e	40 mm dia	20	NO				
f	32 mm dia	20	NO				
g	25 mm dia	25	NO				
<b>2</b>	<b>Dismantling of Hydrant &amp; Accessories</b> Single Heaed Hydrant Valve	10	NO				
a	Hose Reel	10	NO				
<b>I</b>	<b>GAS SUPPRESSION SYSTEM FOR SERVER ROOM</b> 120 ltrs. TANK and VALVE ASSEMBLY	1	NO				
a	NOVEC 1230 AGENT PER 1KG	100	KG				
b	Supervisory presure switch - standard (open on fall)	1	NO				
c	1/4 NPT X 1/4 BSPP M ADPT	1	NO				
d	Male Elbow, 7/16-20 x 1/4 in. NPT	1	NO				
e	Male Connector 7/16 - 20 x 1/4" NPT	1	NO				
f	Act. Hose, SWL, SS BR, 24", 1/4" FML	1	NO				
g	ELECTRIC ACTUATOR 24 VDC	1	NO				
h	2" FLEXIBLE DISC HOSE	1	NO				
i	LOCAL MANUAL ACTUATOR	1	NO				
j	WARNING PLATE-DO NOT ENTR	1	NO				
k	WARNING PLATE-VACATE AREA	1	NO				
l	Cylinder bracket for 120L Smless cyl	2	NO				
m	Brass nozzle - 32mm 360 degree NPT	1	NO				
n	Brass nozzle - 25mm 360 degree NPT	1	NO				
o	Brass nozzle - 15mm 360 degree NPT	1	NO				
p	Pr. SWT, DPST, WP (2-3/4" outl't), Lat.	1	NO				
q	MS Seamless Pipe for ASTM 106 sch 40 complete with fitting MS angle & support	1	Lot				
r	2C x 1.5 sq.mm cooper armoured shielded cable with saddle ,spacer, screw, rawal plug etc.	100	Mtr				
s	2 Core Cable Gland	20	Nos				
t	Conventional Two Zone cross connection G R P panel	1	Nos				
u	Conventional Manual Abort Station	1	Nos				

Sr.No.	DESCRIPTION OF WORK	UNIT	TOTAL QTY	SUPPLY RATE	INSTALLATION RATE	TOTAL RATE	TOTAL AMOUNT
v	Conventional Manual Release Station	1	Nos				
w	Conventional Smoke Detector with JB	6	Nos				
x	Conventional Remote indicator	4	Nos				
y	Conventional Hooter	1	Nos				
z	Conventional Manual call point	1	Nos.				
<b>J</b>	<b>GAS SUPPRESSION SYSTEM FOR DTH ROOM</b> 35 ltrs. TANK and VALVE ASSEMBLY	1	NO				
a	NOVEC 1230 AGENT PER 1KG	20	KG				
b	Supervisory pressure switch - standard (open on fall)	1	NO				
c	1/4 NPT X 1/4 BSPP M ADPT	1	NO				
d	Male Elbow, 7/16-20 x 1/4 in. NPT	1	NO				
e	Male Connector 7/16 - 20 x 1/4" NPT	1	NO				
f	Act. Hose, SWL, SS BR, 24", 1/4" FML	1	NO				
g	ELECTRIC ACTUATOR 24 VDC	1	NO				
h	2" FLEXIBLE DISC HOSE	1	NO				
i	LOCAL MANUAL ACTUATOR	1	NO				
j	WARNING PLATE-DO NOT ENTR	1	NO				
k	WARNING PLATE-VACATE AREA	1	NO				
l	Cylinder bracket for 35L Smless cyl	2	NO				
m	Brass nozzle - 32mm 360 degree NPT	1	NO				
n	Brass nozzle - 25mm 360 degree NPT	1	NO				
o	Pr. SWT, DPST, WP (2-3/4" outl't), Lat.	1	NO				
p	MS Seamless Pipe for ASTM 106 sch 40 complete with fitting MS angle & support	1	Lot				
q	2C x 1.5 sq.mm cooper armoured shielded cable with saddle ,spacer, screw, rawal plug etc.	50	Mtr				
r	2 Core Cable Gland	10	Nos				
s	Conventional Two Zone cross connection G R P panel	1	Nos				
t	Conventional Manual Abort Station	1	Nos				
u	Conventional Manual Release Station	1	Nos				
v	Conventional Smoke Detector with JB	3	Nos				
w	Conventional Remote indicator	2	Nos				
x	Conventional Hooter	1	Nos				
y	Conventional Manual call point	1	Nos.				
	<b>TOTAL AMOUNT OF FIRE FIGHTING WORKS RS.</b>						
<b>F</b>	<b>PNG WORKS</b>						
1	SUPPLY AND INSTALLATION / MODIFICATION OF MS PIPE LINE AND PNEUMATIC TESTING	INCH DIA	1200				
2	SERVICING OF PRESSURE REDUCTION STATION (INCLUDING ALL ELCTRO-MECH EQUIPMENTS)	SET	1				
3	SERVICING OF ISOLATION VALVE - 3"	NO	10				
4	SERVICING OF ISOLATION VALVE - 2"	NO	30				
5	SERVICING OF ISOLATION VALVE - 1.5"	NO	25				
6	SERVICING OF ISOLATION VALVE - 1"	NO	50				
7	UPGRADATION AND COMMISSIONING OF GAS LEAKAGE /FIRE DETECTOR SYSTEM	NO	2				
8	CERTIFICATION OF PNG SYSTEM THROUGH APPROVED TPI AGENCY	NO	2				
9	COMMISSIONING OF NATURAL GAS	NO	2				
10	SUBMISSION OF AS BUILT DRAWINGS FOR SYSTEM		1				
	<b>TOTAL AMOUNT OF PNG WORKS RS.</b>						
	<b>GROSS TOTAL AMOUNT (A to F) RS.</b>						