

HSCC/Safdarjung/Pkg-II/2013

Dated : 10.09.2013

To,

All Bidders

Amendment-VII

Subject:- Package-II : Tender for Construction of EMERGENCY BLOCK including Associated Services and Operation & Maintenance during Defect Liability Period at Safdarjung hospital, New Delhi.

Dear Sir,

This has reference to the subject works,

The following AMMENDMENT-VII/CLARIFICATION-VII may be noted, which shall be treated as a part of the tender to be uploaded along with tender.

1. The revised cost summary sheet (PART-A & PART-B (Optional item)) is uploaded along with revised BOQ/estimate of HVAC works. **Bidders are requested to quote their percentage rates in the revised summary sheet only for PART-A & B considering this amendment.**
2. **The service tax is not applicable for subject tender works.**
3. **All bidders are requested to upload all the tender documents containing Volume- 1 to Volume-VI including all amendments (I to VII)**
4. **Processing fee of Rs. 5618/- to be paid for participation of e-tender. To know the payment process, please see “Help Manuals” available on Home page of [the www.tenderwizard.com/hsc](http://www.tenderwizard.com/hsc)**

All other terms and conditions of the tender shall remain unchanged.

Prospective bidders are advised to regularly scan through HSCC web site as corrigendum/amendments etc., if any, will be notified on HSCC web site and separate advertisement will not be made for this.

Thanking you,

Yours faithfully,

(P.S.Rao)

Dy. General Manager (Civil)

BILL OF QUANTITIES OF REVISED HVAC WORKS FOR EMERGENCY BLOCK , SAFDARJUNG, NEW DELHI					
Item No.	Description	Qty	Unit	Rate In Rs. (in Figure)	Amount (Rs.)
1	2	3	4	5	7
The prices are to be quoted in the below mentioned form and shall include the supply, installation, testing & commissioning at site of all the equipments, ancillary materials as specified and all such items what so ever which may be required to fulfill the intent and purpose as					
The tenderer shall quote rates in figures and in words under column 5&6 and extend amount to column 7					
Note:	All Equipment will be BMS Compatible with BACnet / MODbus protocol				
A)	<u>EQUIPMENTS</u>				
1.0	WATER CHILLING UNITS. (Emergency Block)				
1.1	Supply, Installation, Testing and Commissioning of water cooled centrifugal type Water chiller machines (ARI Certified imported) each having a capacity of 500 TR (actual) at chilled water inlet/outlet temperature of 12.22°C /6.6°C with chilled water circulation rate of 1200 USGPM (nominal) and condenser water inlet/outlet temprature of 32.2°C /37.8°C with circulation rate of 1500 USGPM (Nominal), suitable for operation on refrigerant R134a each comprising of the following complete as per specification and as required				
a)	1 No.- centrifugal type compressor hermetic / semi hermetic / open, single/multistage type, automatic capacity control, safety switches, speed increasing gears, forced feed lubrication system etc. as per specifications.				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
b)	1 No.- Suitable capacity squirrel cage induction motor with class 'F' insulation suitable for operation on 415±10% volts, 50 Hz A.C. supply.				
c)	1 No. Variable speed / frequency starter suitable for compressor motor complete with active armonic filters complying to IEEE519 or equivalent for hospitals, ammeter with CT's over load protection, under voltage protection against phase reversal and independent single phase preventors etc. complete with control wiring as required.				
d)	Necessary drive arrangement.				
e)	1 Set- Lubrication Device consisting of automatic electric oil pump, oil cooler, head tank, oil strainer, automatic oil pressure regulating valve, oil heater, oil heater thermal switch etc. and related controls.				
f)	1 No.- Matching shell and tube water cooled condenser of M.S. shell and integrally finned copper tubes with marine boxes.				
g)	1 No.- Matching shell and tube flooded type chiller of M.S. shell and integrally finned copper tubes and marine boxes.				
h)	1 Lot- refrigerant piping fittings, valve and accessories to inter connect compressor, condenser, chiller and expansion valve.				
i)	1 Set- Advanced Microprocessor based control pannel with automatic controls, coloured & graphical display, complete with accessories as per specifications.				
j)	Lot- Refrigerant line accessories comprising of safety valves, angle valve, liquid line indications, liquid levelcontrol etc.				
k)	Lot- water flow switches at inlet and outlet of condenser & chiller, water drain and air purge valves wherever required.				
l)	Lot- Thermal insulation on machine as required.				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
m)	Lot- Frame work for mounting the above condenser, chiller, compressor and motor with base plate complete with antivibration pads/ springs.				
n)	Lot- Initial/First charge of refrigerant gas and compressor oil.				
o)	Max kW/TR - 0.66				
p)	C.O.P at ARI conditions > 6.3				
q)	Microprocessor based control panel complete with accessories as per specifications and BMS compatible BACNET / MODBUS Protocol				
	Chiller Fouling Factor : 0.0005 (FPS Unit)				
	Condenser Fouling Factor : 0.001 (FPS Unit)				
	Complete water chilling machine as above.	3	Nos	11710545	35131635
1.2	<u>Plant Room Manager (Emergency Block)</u>				
	Plant room manager - Plant Room Manager for sequencing, remote monitoring, controlling and report generation of above equipments (4 # chillers, 4 # primary chilled water pumps, 4 # condenser water pumps & 4 CTs) . Selected controller shall have capability to meet detailed IO summary mentioned under specifications. Supervisory controller for management level interface in MS Enclosure SWG thickness, powder coated Siemens grey for Supervisory Controller, IO Cards (with accessories like Transformer, MCBs, internal wiring and Relays with bases). Workstation PC i5 computer 3000 Mhz with 500 GB hard disk, 21" TFT monitor, 104 windows key board, mouse, serial and parallel ports with laser colour printer. This must have software integration on chillers with 3rd party interface available on Bacnet including cabling & conduit work as required.	1	Lot	1815308	1815308

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
2.0	WATER CIRCULATION PUMPS				
2.1	Primary Chilled Water Pumps				
	Supply, installation, testing and commissioning of vertical split casing end suction type centrifugal chilled water pump sets factory assembled and tested for rated efficiency mounted on a common base frame etc each capable of delivering specified flow rate complete with following as per specifications & schedule of equipments.				
	a. Pump with IP 55 TEFC induction motor with class F insulation, EFF-1.				
	b. Channel base with vibration isolators, coupling, coupling guard etc.				
	c. Cladded insulation and anti corrosive coating inside and outside casing etc. of chilled water pump.				
	d. 2 Nos.- 150 mm dia dial type pressure gauge				
	e. Pumps shall be suitable for operation on 415+/- 10% Volts/ 3ph / 50 Hz/AC power supply.				
	The pump characteristic shall be as follows:				
	For Emergency Block				
2.1.1	Water flow rate=1200 USGPM Head = 14 Metre WC				
	Primary chilled water pumps as described above.	3	Nos	181271	543813
2.2	Secondary Pumps & Variable Speed Pumping System				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
	Supply, installation, testing and commissioning of split casing type centrifugal chilled water recirculation pumps mounted on a common base etc each capable of delivering specified flow rate complete with following as per specifications & schedule of equipments.				
	a. Pump with IP 55 TEFC induction motor with class F insulation, EFF-1.				
	b. Channel base with vibration isolators, coupling, coupling guard etc.				
	c. Cladded insulation and anti corrosive coating inside and outside casing etc. of chilled water pump.				
	d. 2 Nos.- 150 mm dia dial type pressure gauge				
	e. Pumps shall be suitable for operation on 415+/- 10% Volts/ 3ph / 50 Hz/AC power supply.				
	f. The price will include control software and networking hardware and software for integration and compatibility with BMS (BACNET Protocol).				
	g. All pumps to be provided with seperate VFD's (variable frequency drives). Control panel should also consist of cooling fan.				
	h. Electronic Differential Pressure Transmitters and PLC as required.				
	i. The cost will include making necessary flanged suction and delivery headers in C-Class MS				
	j. Complete set system to be mounted on a common MS base frame and shall follow following duty.				
	The pump characteristic shall be as follows:				
	Emergency Block				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
2.2.1	1800 USGPM				
	Head = 25 Metre WC				
	Secondary chilled water pumps as described above.	2	Nos	381888	763776
2.3	Condenser water Pumps				
	Supply, installation, testing and commissioning of vertical split casing end suction type centrifugal pump sets factory assembled and tested for rated efficiency mounted on a common base frame etc each capable of delivering specified flow rate complete with following as per specifications & schedule of equipments.				
	a. Pump with IP 55 TEFC induction motor with class F insulation, EFF-1.				
	b. Channel base with vibration isolators, coupling, coupling guard etc.				
	c. Cladded insulation and anti corrosive coating inside and outside casing etc. of chilled water pump.				
	d. 2 Nos.- 150 mm dia dial type pressure gauge				
	e. Pumps shall be suitable for operation on 415+/- 10% Volts/ 3ph / 50 Hz/AC power supply.				
	The pump characteristic shall be as follows:				
	Emergency Block				
2.3.1	Water flow rate=1500 USGPM				
	Head = 27 Metre WC				
	Condenser water pumps as described above.	3	Nos.	244818	734454
2.4	Hot water Pumps				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
	Supply, installation, testing and commissioning of vertical split casing type centrifugal hot water recirculation pump sets factory assembled and tested for rated efficiency mounted on a common base etc each capable of delivering specified flow rate complete with following as per specifications & schedule of equipments.				
	a. Pump with IP 55 TEFC induction motor with class F insulation, EFF-1.				
	b. Channel base with vibration isolators, coupling, coupling guard etc.				
	c. Cladded insulation and anti corrosive coating inside and outside casing etc. of chilled water pump.				
	d. 2 Nos.- 150 mm dia dial type pressure gauge				
	e. Pumps shall be suitable for operation on 415+/- 10% Volts/ 3ph / 50 Hz/AC power supply.				
	The pump characteristic shall be as follows:				
2.4.1	Water flow rate=200 USGPM (for Emergency)				
	Head = 24 Metre WC				
	Hot water pumps as described above.	2	Nos	114086	228172
3.0	COOLING TOWER (CTI Certified)				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
	Supply, installation, testing and commissioning of induced draft FRP type cooling towers for air conditioning system. Each tower shall be complete with distribution system, filling, louvers, steel ladder, fan , motor , VFD and VFD controller. Motor shall be IP 55 suitable for outdoor installation, 415±10% volts, 50 Hz, 3 phase power supply, Eff-1. Isolator enclosed in weather proof panel complete with earthing shall be included. Tower shall be selected on basis of water temperature 100 -90 degree F, ambient wet bulb 83 deg F .Cooling tower shall be compatible for working with BMS. Capacity shall be as follows:-				
3.1	700 TR capacity , 1500 usgpm (min 02 cells in each)				
	Cooling Tower as described above.	3	Nos.	1017822	3053466
4.0	Hot Water Generator				
	Supply, installation, testing & commissioning of Electric Hot Water Generator for winter heating/monsoon reheating system. Hot water shall be with IP 55 protection and compatible with controls, sensors,controll cabling,piping and fittings,thermal insulation, BMS compatible with communication port, base frame etc. as per specifications.				
	Emergency Block				
4.1	Capacity : 300 KW				
	Status : 3W				
	USGPM: 300				
	Temp IN/OUT : 110/125 DegF	3	Nos.	533760	1601280

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
4.2	Capacity : 200 KW Status : 1W+1S USGPM: 200				
	Temp IN/OUT : 110/125 DegF	2	Nos.	378073	756147
5.0	AIR HANDLING UNITS				
5.1	Supply, installation, testing and commissioning of draw through type Air Handling Units (double skin type) of horizontal /2-tier as specified & shown in schedule of equipment complete with the following :- a. Fan Section and canvas connection, Mixing Box, Thermal break profile. (double skin type) b. Centrifugal blower c. Coil section with cooling coil, heating coils as per specifications. d. Pre filters with filter section in all AHUs. e. Fine and hepa filters with filter section wherever specifically specified as per AHU schedule .Wherever fine/hepa filters are specified, item shall include factory fabricated double skin plenum of same specifications as AHU panels and complete with filter frameworks.Fine/hepa filter section along with discharge plenum shall be part of AHU in upper tier. f. Drain pan, drain connection. g. Squirrel cage induction IP 55 TEFC , Insulation class 'F', Duty S1 , EFF-1 drive motor, drive arrangement, guard etc. All AHU motors shall be compatible for working with VFD. h. Necessary vibration isolators & supporting arrangement.				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
	i. Fresh air intake arrangement, necessary water drain & air purge valves wherever required etc.				
	j. Canvass connections,necessary foundations, 2 nos pressure gauge, 2 nos thermometer etc				
	k. Controls for AHUs comprising of a set of PN-16 rating 2 Way pressure independent dynamic balancing cum control valve of required size fitted with modulating actuators having manual override facility on each AHU alongwith wiring for interconnections with 1.5 sq. mm Cu Conductor multicore armoured complete as required. The actuator shall have required shut off capability of minimum 4 bar rating. The acuator shall be compatible with BMS.The valve actuator shall be capable of accepting 2-10 volt DC, 4-20 mA electric signal and shall provide similar transduced feedback output signal to control system.				
	Emergency Block				
5.1.1	AH-BF-01 - 13000cfm/ 4RD Cooling Coil/2 RD Heating coil /80 mm static (with pre & fine filter)	1	Nos.	584786	584786
5.1.2	AH-GF-01 - 18000cfm/ 4RD Cooling Coil/80 mm static (with fine filter)	1	Nos.	713811	713811
5.1.3	AH-GF-02 - 16000cfm/ 4RD Cooling Coil/80 mm static (with fine filter)	1	Nos.	621824	621824
5.1.4	AH-GF-03 - 11000cfm/ 4RD Cooling Coil /80 mm static (with fine filter)	1	Nos.	463843	463843
5.1.5	AH-GF-04 - 8500cfm/ 4RD Cooling Coil/80 mm static (with fine filter)	1	Nos.	396098	396098
5.1.6	AH-GF-05 - 3000 cfm/ 6RD Cooling Coil/ 2 RD Heating coil/135 mm static (with pre, fine, Hepa filters)	1	Nos.	286198	286198

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
5.1.7	AH-GF-06 - 3100 cfm/ 6RD Cooling Coil/ 2 RD Heating coil/135 mm static (with pre, fine, Hepa filters)	1	Nos.	286333	286333
5.1.8	AH-GF-07 - 10500cfm/ 4RD Cooling Coil /80 mm static (with fine filter)	1	Nos.	447277	447277
5.1.9	AH-GF-08 - 15000cfm/ 4RD Cooling Coil /45 mm static	1	Nos.	424246	424246
5.1.10	AH-FF-01 - 6000cfm/ 4RD Cooling Coil /80 mm static (with fine filter)	1	Nos.	296838	296838
5.1.11	AH-FF-02 - 5500cfm/ 4RD Cooling Coil/80 mm static (with fine filter)	1	Nos.	292393	292393
5.1.12	AH-FF-03 - 4500cfm/ 4RD Cooling Coil/50 mm static	1	Nos.	192864	192864
5.1.13	AH-FF-04 - 14000cfm/ 4RD Cooling Coil/2 RD Heating coil /80 mm static (with fine filter)	1	Nos.	635157	635157
5.1.14	AH-FF-05, 06 - 8000cfm/ 4RD Cooling Coil/2 RD Heating coil /80 mm static (with fine filter)	2	Nos.	391923	783846
5.1.15	AH-FF-07 - 9000cfm/ 4RD Cooling Coil/40 mm static	1	Nos.	294009	294009
5.1.16	AH-FF-08 - 20000 cfm/ 4RD Cooling Coil/ 40 mm static	1	Nos.	574012	574012
5.1.17	AH-SF-01 - 6000 cfm/ 4RD Cooling Coil/40 mm static	1	Nos.	223436	223436
5.1.18	AH-SF-02 - 6500 cfm/ 4RD Cooling Coil/ 2 RD Heating coil/80 mm static (with pre, fine filter)	1	Nos.	364717	364717
5.1.19	AH-SF-03 - 7000 cfm/ 4RD Cooling Coil/ 2 RD Heating coil/80 mm static (with pre fine filter)	1	Nos.	379128	379128
5.1.20	AH-SF-04 - 8000 cfm/ 4RD Cooling Coil/ 2 RD Heating coil/80 mm static (with pre, fine filters)	1	Nos.	391923	391923
5.1.21	AH-SF-05 - 4500 cfm/ 4RD Cooling Coil/35 mm static	1	Nos.	187881	187881

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
5.1.22	AH-SF-06, 07, 08, 09, 10, 11, 12, 13, 14, 15, 16 - 2500cfm/ 6RD Cooling Coil/ 2 RD Heating coil/135 mm static (with pre, fine, Hepa filters)	11	Nos.	265726	2922986
5.1.23	AH-SF-017 - 8000 cfm/ 4RD Cooling Coil/2 RD Heating coil /80 mm static (with fine filter)	1	Nos.	392596	392596
5.1.24	AH-SF-18 - 5000 cfm/ 4RD Cooling Coil /35 mm static	1	Nos.	192460	192460
5.1.25	AH-SF-19 - 10000 cfm/ 4RD Cooling Coil/80 mm static (with fine filter)	1	Nos.	465593	465593
5.1.26	AH-SF-20 - 23000cfm/ 4RD Cooling Coil /50 mm static	1	Nos.	666403	666403
5.1.27	AH-4F-01 - 25500cfm/ 4RD Cooling Coil/80 mm static (with fine filter)	1	Nos.	929705	929705
5.1.28	AH-4F-02 - 4600cfm/ 4RD Cooling Coil /40 mm static	1	Nos.	188823	188823
5.1.29	AH-4F-03 - 5500cfm/ 4RD Cooling Coil/40 mm static	1	Nos.	204850	204850
5.1.30	AH-4F-04 - 10000cfm/ 4RD Cooling Coil /45 mm static	1	Nos.	311787	311787
5.1.31	AH-5F-01 - 25500cfm/ 4RD Cooling Coil/80 mm static (with fine filter)	1	Nos.	929705	929705
5.1.32	AH-5F-02 - 4600cfm/ 4RD Cooling Coil /40 mm static	1	Nos.	188823	188823
5.1.33	AH-5F-03 - 5500cfm/ 4RD Cooling Coil/40 mm static	1	Nos.	204850	204850
5.1.34	AH-5F-04 - 10000cfm/ 4RD Cooling Coil /45 mm static	1	Nos.	311787	311787

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
5.1.35	AH-6F-01 - 25500cfm/ 4RD Cooling Coil/80 mm static (with fine filter)	1	Nos.	929705	929705
5.1.36	AH-6F-02 - 4600cfm/ 4RD Cooling Coil /40 mm static	1	Nos.	188823	188823
5.1.37	AH-6F-03 - 5500cfm/ 4RD Cooling Coil/40 mm static	1	Nos.	204850	204850
5.1.38	AH-6F-04 - 10000cfm/ 4RD Cooling Coil /45 mm static	1	Nos.	311787	311787
5.1.39	AH-7F-01 - 25500cfm/ 4RD Cooling Coil/80 mm static (with fine filter)	1	Nos.	929705	929705
5.1.40	AH-7F-02 - 4600cfm/ 4RD Cooling Coil /40 mm static	1	Nos.	188823	188823
5.1.41	AH-7F-03 - 5500cfm/ 4RD Cooling Coil/40 mm static	1	Nos.	204850	204850
5.1.42	AH-7F-04 - 10000cfm/ 4RD Cooling Coil /45 mm static	1	Nos.	311787	311787
5.1.43	AH-8F-01 - 25500cfm/ 4RD Cooling Coil/80 mm static (with fine filter)	1	Nos.	929705	929705
5.1.44	AH-8F-02 - 4600cfm/ 4RD Cooling Coil /40 mm static	1	Nos.	188823	188823
5.1.45	AH-8F-03 - 5500cfm/ 4RD Cooling Coil/40 mm static (with fine filter)	1	Nos.	204850	204850
5.1.46	AH-8F-04 - 10000cfm/ 4RD Cooling Coil /45 mm static	1	Nos.	311787	311787

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
5.2	Supply, installation, testing and commissioning of Heat Recovery Wheel suitable for housing in AHUs mentioned above and conforming to standard specification. The capacity of Heat Recovery Wheel shall be as follows. The face velocity across HRW shall be 700 FPM				
	Emergency Block				
5.2.1	2500 cfm	2	Nos.	561003	1122006
5.3	CEILING SUSPENDED UNITS				
	Supply, installation, testing and commissioning of draw through type Air Handling Units (double skin type) of ceiling suspended type as specified & shown in schedule of equipment complete with the following :-				
	a. Fan Section and canvas connection, Thermal break profile. (double skin type)				
	b. Centrifugal blower				
	c. Coil as per specifications.				
	d. Pre filters as required				
	e. Drain pan, drain connection.				
	f. Squirrel cage induction drive motor IP 55, TEFC , Insulation class 'F', Duty S1, EFF-1 drive arrangement, guard etc.All AHU motors shall be compatible for working with VFD.				
	g. Necessary vibration isolators & supporting arrangement.				
	h. Fresh air intake arrangement,necessary water drain & air purge valves wherever required etc.				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
	i. Canvass connections,suspension arrangement, 2 nos pressure gauge, 2 nos thermometer etc				
	j. Controls for AHUs comprising of a set of PN-16 rating 2 Way pressure independent dynamic balancing cum control valve of required size fitted with modulating actuators having manual override facility on each AHU alongwith wiring for interconnections with 1.5 sq. mm Cu Conductor multicore armoured complete as required. The actuator shall have required shut off capability of minimum 4 bar rating. The acuator shall be compatible with BMS. The valve actuator shall be capable of accepting 2-10 volt DC, 4-20 mA electric signal and shall provide similar transduced feedback output signal to control system.				
	Emergency block				
5.3.1	CSU-FF-01 - 4000cfm/ 4RD Cooling Coil/40 mm static	1	Nos.	143705	143705
5.3.2	CSU-FF-02 - 2200cfm/ 4RD Cooling Coil/40 mm static	1	Nos.	126849	126849
5.3.3	CSU-SF-01 - 1200cfm/ 4RD Cooling Coil/40 mm static	1	Nos.	93033	93033
5.3.4	CSU-SF-02 - 3000cfm/ 4RD Cooling Coil/40 mm static	1	Nos.	140251	140251
5.3.5	CSU-SF-01 - 1200cfm/ 4RD Cooling Coil/40 mm static	1	Nos.	93033	93033
5.3.6	TFA - 1000cfm/ 8RD Cooling Coil/2RD heating coil/80 mm static (with fine filter)	5	Nos.	172353	861765
5.4	VAV Boxes				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
	Pressure independent variable air volume boxes complete with damper, differential pressure sensor, thermostat, damper actuator, controller capable of accepting signal from thermostat and output to damper actuator with silencer.VAV boxes shall be factory calibrated.Quoted price shall include motorised damper with actuator, cooling digital thermostat withon-off control, 24 V power supply unit,differential pressure sensor and required electrical/ control wiring to complete the commissioning.VAV boxes shall be suitable for following air flow capacities :-				
5.4.1	800 cfm	2	Nos.	80809	161618
5.4.2	1500 cfm	30	Nos.	101011	3030330
5.4.3	2100 cfm	5	Nos.	121213	606065
5.4.4	3500 cfm	20	Nos.	154884	3097680
5.5	HEAT RECLAIM VENTILATION UNIT				
	Supply, installation , testing and commissioning of heat reclaim ventilation with inlet and exhaust blower with fan (Inlet & exhaust) desiccant absorption material non contact seal, modular design with Aluminium supports of extruded section, galvanized steel plate casing, self extinguishable polyurethane foam insulation, multi-directional fibrous fleeces air filter including electric panel with cabling & earthing complete as per requirements.				
5.5.1	75% efficiency				
	(F/A - 850 cfm & R/A 850 cfm)	10	Nos.	85000	850000

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
5.6	FAN COIL UNITS				
	Supply, installation, testing and commissioning of horizontal type sheet metal ceiling suspended FCU's each complete with 3/4 row deep chilled water cooling coil of copper tubes aluminium fins construction, centrifugal fan, 3 speed motor, aluminium cleanable filters insulated condensate drain pan, coil piping connections, condensate drain connection, 2 way motorised cum automatic balancing valves provided with spring return function & fitted with modulating actuators in chilled water lines at each fan coil unit. The actuator shall have required shut off capability of minimum 4 bar rating and should be able to accept 24V power supply. The valves and actuator shall be compatible with BMS complete vibration isolator, wiring complete as required, with ball valve, ball valve with strainer as required as per specification & drawings with the following capacities:-				
5.6.1	1.0 TR	1	Nos.	19632	19632
5.6.2	1.5 TR	19	Nos.	21327	405213
5.6.3	2.0 TR	50	Nos.	23799	1189950
5.6.4	2.5 TR	5	Nos.	28743	143715
6.0	Supply , installation , testing and commisioning of air cooled (Precision cooling) split air conditioner with scroll compressors suitable for 3 Phase 50 Hz AC supply comprising of the following.				
	a) Outdoor condensing Units				
	b) Indoor Evaporative Units with fine filters.				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
	c) Interconnecting Refrigerant and drain piping with insulation wherever required, refrigerant and oil. The unit shall include refrigerant piping, power cabling and drain piping as required.				
	d) Safety and operational controls				
	e) The unit shall have advanced microcomputer controller with run time equalization, auto restart after power failure, fuzzy logic, self fault diagnostics . The controller shall have 2 digit 7 segment LED display, LED indicators and touch key pad. The controller shall have faults and alarm display and it shall be mounted in fire retardant box. The equipment shall be equipped with humidity control.				
6.1	Capacity : 8.5 TR	2	Nos.	667927	1335854
6.2	Capacity : 5.5 TR	2	Nos.	501628	1003256
7.0	Air Washer Unit				
	Supply, installation, testing and commissioning of air washer units for air cooling work constructed as per detailed specifications and drawings, complete with 50mm thick prefilter, minimum 200mm deep celldeck pad, water circulating pump, DIDW centrifugal fan, TEFC squirrel cage induction motor V-belt & drive set vibration isolators, internal piping with class 'B' piping, quick fill, make up drain, overflow connection float valve etc. complete with all respects. Mounting frame of angle iron for floor / wall mounting. Price must include starter panel, cabling, control wiring, earthing etc.				
	Duty: Laundry ventilation				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
7.1	25000 CFM with 50mm static pressure	1	No.	447388	447388
7.2	Factory Fabricated Double Skin Scrubber				
	Supply, installation, testing and commissioning of factory fabricated Double Skinned Scrubber unit floor mounted type fabricated out of extruded aluminium section with 0.6mm pre-plasticized /pre-coated Galvanised steel sheet outside & 0.6 mm plain Galvanised steel sheet inside with blower, blower section and blower motor TEFC type suitable for operation on 415 volts \pm 10%, 50 Hz \pm 5% AC supply, belt drive package, wet section & tank shall be made of 18 G tainless steel. The Scrubber shall be complete with spray arrangement with metallic viscous filter & face velocity across the section shall be limited to 152 MPM				
	The scrubber shall have an efficiency of 90% & shall be complete with water circulation pump GI B Class interconnecting piping & valves, viscous filters. The scrubber panels shall be insulated with 23mm thick & 36 Kg/m ³ density PU foam. The scrubber shall conform to specification given in the tender & shall be of following capacity.				
	a) Scrubber - 25,000 CFM, 50 mm St. Pr. 800 mm Dia Fan,	1	No.	450000	450000
	11.0 KW Motor, 2x0.37 Kw Water Circulation Pump				
8.0	Inline Fans/ Propeller Fans				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
8.1	Supply, installation, testing and commissioning of Inline Fans as shown in drawings and as per equipment schedule .Each fan shall be complete with centrifugal blowers, totally enclosed fan cooled motor. Fan motor shall be suitable for single phase, 220 +/- 6% V, 50 Hz AC supply. The casing of inline fans shall be acoustically lined & shall be selected for lower noise level. Fan motor shall have inbuilt speed controller. Item shall be complete with starter & cabling.				
	Inline Fans				
8.1.1	Duty: OT Defumigation				
	Air Quantity :500 CFM	13	Nos.	19292	250796
	Static Pressure :15 mm wg				
8.1.2	Duty: Toilet Exhaust				
	Air Quantity :1250 CFM	2	Nos.	27857	55714
	Static Pressure :20 mm wg				
8.1.3	Duty: Toilet Exhaust				
	Air Quantity :800 CFM	2	Nos.	27187	54374
	Static Pressure :20 mm wg				
8.1.4	Duty: Toilet Exhaust				
	Air Quantity :600 CFM	24	Nos.	19292	463008
	Static Pressure :20 mm wg				
8.1.5	Duty: Toilet Exhaust				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
	Air Quantity :400 CFM	4	Nos.	18174	72696
	Static Pressure :20 mm wg				
8.2	Supplying, installing, testing and commissioning of direct driven Propeller fan for exhaust air as shown in drawings. Each fan shall be complete with permanent split capacitor or shaded pole motor, mounting plate, accessories like wire guard, bird screen and fixed louvers for weather protection as required. Fan selection arrangement and Electrical characteristics shall be as follows:				
8.2.1	300 mm dia 900 RPM fan suitable for 220 +/- 10% volts, 50 Cycles, 1 Phase AC Supply	12	Nos	8170	98040
8.2.2	225 mm dia 900 RPM fan suitable for 220 +/- 10% volts, 50 Cycles, 1 Phase AC Supply	12	Nos	6173	74076
9.0	Ventilation Fans				
9.1	Tube Axial Flow				
	Supply, installation,testing and commissioning of tube axial flow fans as shown in drawings, Each fan shall be direct driven. Fan motor shall be suitable for 3 Phase, 415+/- 10% V, 50Hz AC supply .				
9.1.1	Duty: Lift well pressurisation				
	Air Quantity : 9000 CFM				
	Static Pressure : 25 mm wg	6	No.	86785	520710
9.1.2	Duty: Lift lobby pressurisation				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
	Air Quantity : 7500 CFM				
	Static Pressure : 25 mm wg	3	No.	72303	216909
9.2	Centrifugal Fans				
	Supply, installation, testing and commissioning of double width double inlet class I CENTRIFUGAL FANS for ventilation system. Each fan shall be complete with TEFC type IP 55 motor with class F insulation, belt drive, pulley mounted on motor & fan shaft, belt guard, motor mount, casing and vibration isolators as per specifications and shop drawings. All exposed fan shall be covered with GI housing as per approved shop drawings to protect fan and motors from weather. Fan motor shall be suitable for 3 Phase, 415+/- 10% V, 50Hz AC supply. Fan shall be complete with gravity louvers.				
	Emergency Block				
	For Basement 2&3 (Fresh Air Fans)				
9.2.1	Air Quantity : 27500 CFM (for normal ventilation)	1	Nos.	321165	321165
	Static Pressure : 30 mm wg				
9.2.2	Air Quantity : 45000 CFM (for normal ventilation)	1	Nos.	584722	584722
	Static Pressure : 30 mm wg				
9.3	Vane Axial Fans (Fire rated)				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
	Supply, installation,testing and commisioning of tube axial flow fans as shown in drawings, Each fan shall be direct driven.. Fan motor shall be suitable for 3 Phase, 415+/- 10% V, 50Hz AC supply with IP 55 protection, class 'H' insulation and EFF-1 class. Fan shall be complete with gravity louvers. Fan shall be 250 deg C, 2hrs fire rated.				
	Emergency Block				
	Ist Basement				
9.3.1	Air Quantity : 16800 CFM, 25 mm st. pr.	1	Nos.	143010	143010
9.3.2	Air Quantity : 12600 CFM, 25 mm st. pr.	2	Nos.	104055	208110
9.3.3	Air Quantity : 12000 CFM, 25 mm st. pr.	1	Nos.	104055	104055
9.3.4	Air Quantity : 18000 CFM, 25 mm st. pr.	1	Nos.	145543	145543
9.3.5	Air Quantity : 10000 CFM, 25 mm st. pr.	1	Nos.	83348	83348
9.3.6	Air Quantity : 15000 CFM, 25 mm st. pr.	1	Nos.	118579	118579
9.3.7	Air Quantity : 10500 CFM, 25 mm st. pr.	2	Nos.	83348	166696

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
9.3.8	Air Quantity : 15800 CFM, 25 mm st. pr.	2	Nos.	118579	237158
9.3.9	Air Quantity : 36500 CFM, 25 mm st. pr.	2	Nos.	352295	704590
	Laundry ventilation				
9.3.10	Air Quantity : 25000 CFM, 25 mm st. pr.	2	Nos.	179359	358718
	2nd & 3rd Basement				
9.3.11	Air Quantity : 27000 CFM, 25 mm st. pr.	8	Nos.	209152	1673216
9.3.12	Air Quantity : 41000 CFM, 25 mm st. pr.	8	Nos.	377049	3016392
9.3.13	Air Quantity : 24000 CFM, 25 mm st. pr.	8	Nos.	176081	1408648
9.3.14	Air Quantity : 35800 CFM, 25 mm st. pr.	8	Nos.	352295	2818360
10.0	EXPANSION TANK				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
	Supply, installation, testing and commissioning of pressurised PVC, expansion tank of following capacities made of PVC 2 layer sheet complete with 50 mm thick fire retardant type 32 kg/mt cu density TF quality expanded polystyrene insulation finished with two layers of sand cement plaster and painted complete with vent, drain connections , float valve, quick fill connection, manhole cover etc as specified. (Of double layered Sintex or equivalent make).				
10.1	2000 ltrs.	1	No.	64041	64041
10.2	1000 ltrs.	1	No.	44828	44828
11.0	Air purification systems				
11.1	<u>PHI SYSTEM</u>				
	Supply, Installation , testing , commissioning and handing over of the imported Photohydroionisation (PHI) System for maintaining indoor Air Quality.The System must be UL listed for fire safety. The components of the system must be in strict conformity with the specifications.and shall be including freight , Insurance etc. as required . The prices to include all inter connected wiring and safety controls between the PHI systems.				
11.1.1	For OTs	13	Set	242853	3157089
11.1.2	For Wards	15	Set	238718	3580770

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
11.2	Supply, installation testing and commissioning of the Ozone Injection System for maintaining indoor quality comprising of duct mounted ozone generators, VOC sensor, controller. Wiring between the Ozone monitor / switch and controller complete as per specification and the air handling capacities as under:-				
11.2.1	For Public toilets	6	Set	200000	1200000
B)	<u>PIPING</u>				
12.0	CONDENSER WATER PIPING & VALVES				
	Supply, laying/fixing, testing and commissioning of M.S. heavy class ERW piping confirming to IS : 3589/IS:1239 with necessary clamps, supports, anti vibration mountings, hangers and fittings such as bends, tees, reducers etc. duly painted as per specifications :				
12.1	450 mm dia	200	RM	11107	2221400
12.2	400 mm dia	50	RM	9456	472800
12.3	300 mm dia	50	RM	4099	204950
12.4	250 mm dia	120	RM	3464	415680
12.5	200 mm dia	50	RM	2732	136600
12.6	150 mm dia	80	RM	1846	147680

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
12.7	125 mm dia	50	RM	1553	77650
12.8	100 mm dia	50	RM	1260	63000
12.9	50 mm dia	150	RM	536	80400
12.10	40 mm dia	300	RM	391	117300
13.0	Valves				
13.1	Butterfly valves : (PN16)				
	Supply, fixing and testing of following valves, strainers, in the chilled water piping complete with companion flanges, nut bolts, gaskets, supports etc. duly insulated and painted as per specifications:				
13.1.1	450 mm dia.	5	Nos	95622	478110
13.1.2	250 mm dia.	28	Nos	18727	524364
13.1.3	200 mm dia.	4	Nos	15083	60333
13.1.4	150 mm dia.	1	Nos	4332	4332
13.1.5	125 mm dia.	4	Nos	3994	15975
13.1.6	50 mm dia.	5	Nos	1895	9476
13.1.7	40 mm dia.	5	Nos	1692	8461
13.2	<u>Motorized Butterfly Valves</u>				
	Providing and fixing the following motorized butterfly valves as per specifications and drawings.				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
13.2.1	250 mm dia.	4	Nos.	82496	329984
13.3	Automatic Balancing Valves				
	Supply, installation, testing and commissioning of automatic balancing valves in return condenser water line of each condenser and cooling tower as per tender specification & of following sizes:				
13.3.1	250 mm dia.	4	Nos	79196	316785
13.4	Non return/Check valves :				
13.4.1	250 mm dia.	4	Nos	18174	72694
13.5	Pot strainer with drain valve				
13.5.1	450 mm dia.	1	Nos	129246	129246
13.6	Y- strainer with drain valve				
13.6.1	250 mm dia.	4	Nos	37318	149272
13.7	Auto Air Vent Valves				
13.7.1	10 mm dia	20	Nos	500	10000

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
13.7.2	15 mm dia	15	Nos	850	12750
13.7.3	20 mm dia	12	Nos	1000	12000
13.7.4	25 mm dia	10	Nos	1200	12000
13.8	<u>Suction Guide</u>				
	Providing and fixing of suction guide of following sizes in the inlet of condenser water pumps as per specifications				
13.8.1	250 mm dia.	4	Nos.	150000	600000
14.0	CHILLED WATER PIPING				
	Supply, laying/fixing, testing and commissioning of M.S. heavy class ERW piping confirming to IS : 3589/IS:1239 with necessary clamps, supports, anti vibration mountings, hangers and fittings such as bends, tees, reducers etc. duly insulated with pre-formed resin bonded fiberglass pipe section insulation having density 80 kg/cum with factory applied aluminum foil facing (insulation thickness shall be as per ECBC 2007 R values requirements) and 26 gauge aluminum sheet cladding (for outdoor application) as per specification and approved shop drawings :				
14.1	400 mm dia	150	RM	10406	1560900
14.2	350 mm dia	50	RM	5379	268950

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
14.3	300 mm dia	120	RM	4917	590040
14.4	250 mm dia	50	RM	4155	207750
14.5	200 mm dia	300	RM	3340	1002000
14.6	150 mm dia	200	RM	2369	473800
14.7	125 mm dia	200	RM	2019	403800
14.8	100 mm dia	550	RM	1677	922350
14.9	80 mm dia	600	RM	1221	732600
14.10	65 mm dia	350	RM	1028	359800
14.11	50 mm dia	280	RM	835	233800
14.12	40 mm dia	650	RM	659	428350
14.13	32 mm dia	600	RM	589	353400
14.14	25 mm dia	250	RM	485	121250
14.15	20 mm dia	750	RM	356	267000
15.0	VALVES & STRAINERS				
	Supply, fixing and testing of following valves, strainers, in the chilled water piping complete with companion flanges, nut bolts, gaskets, supports etc. duly insulated as per specifications:				
15.1	Butterfly valves (PN 16) :				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
15.1.1	450 mm dia.	2	Nos	74454	148908
15.1.2	300 mm dia.	2	Nos	25494	50987
15.1.3	250 mm dia.	6	Nos	19527	117164
15.1.4	200 mm dia.	20	Nos	15783	315667
15.1.5	150 mm dia.	6	Nos	4982	29893
15.1.6	125 mm dia.	14	Nos	4495	62925
15.1.7	100 mm dia.	34	Nos	3648	124016
15.1.8	80 mm dia.	16	Nos	2679	42862
15.1.9	65 mm dia	30	Nos	2319	69582
15.1.10	50 mm dia.	52	Nos	2145	111555
15.1.11	40 mm dia.	16	Nos	1942	31076
15.1.12	32 mm dia	16	Nos	1667	26666
15.1.13	25 mm dia	12	Nos	1667	19999
15.1.14	20 mm dia	80	Nos	1667	133328
15.2	Motorized Butterfly Valves				
	Providing and fixing the following motorized butterfly valves for chilled water pumps and boiler as per specifications				
15.2.1	200 mm dia.	5	Nos.	52863	264314

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
15.3	Balancing valves :				
	Automatic balancing Valve				
15.3.1	200 mm dia. (for chillers)	7	Nos	55120	385843
15.3.2	150 mm dia.	3	Nos	28502	85507
15.3.3	125 mm dia.	6	Nos	19440	116641
15.3.4	100 mm dia.	14	Nos	14043	196597
15.4	Non return/Check valves :				
15.4.1	250 mm dia.	3	Nos	18174	54521
15.4.2	200 mm dia.	4	Nos	11857	47430
15.4.3	150 mm dia.	1	Nos	6964	6964
15.4.4	125 mm dia.	3	Nos	5284	15853
15.4.5	100 mm dia.	1	Nos	4100	4100
15.4.6	80 mm dia.	1	Nos	3661	3661
15.4.7	65 mm dia.	1	Nos	3323	3323
15.4.8	50 mm dia.	1	Nos	2986	2986
15.5	Y- strainers with drain valve				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
15.5.1	250 mm dia.	3	Nos	28846	86538
15.5.2	200 mm dia.	4	Nos	22686	90744
15.5.3	150 mm dia.	2	Nos	19987	39974
15.5.4	125 mm dia.	2	Nos	19987	39974
15.5.5	100 mm dia.	10	Nos	8707	87070
15.5.6	80 mm dia.	8	Nos	6281	50248
15.5.7	65 mm dia	15	Nos	4332	64980
15.5.8	50 mm dia	31	Nos	4000	124000
15.5.9	40 mm dia	6	Nos	2781	16686
15.5.10	32 mm dia	6	Nos	2781	16686
15.5.11	25 mm dia	6	Nos	2781	16686
15.5.12	20 mm dia	70	Nos	2781	194670
15.6	Suction Guide				
	Providing and fixing of suction guide of following sizes in the inlet of chilled water pumps as per specifications				
15.6.1	200 mm	4	Nos.	50000	200000
15.7	Providing and fixing in position the following Gate Valves duly insulated as per specifications:				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
15.7.1	50 mm dia Valves	4	Nos.	2500	10000
15.7.2	40 mm dia Valves	4	Nos.	2000	8000
15.7.3	32 mm dia Valves	12	Nos.	1800	21600
15.8	Auto Air Vent Valves				
15.8.1	10 mm dia	15	Nos.	500	7500
15.8.2	15 mm dia	20	Nos.	850	17000
15.8.3	20 mm dia	10	Nos.	1000	10000
15.8.4	25 mm dia	10	Nos.	1200	12000
15.9	Ball Valve with strainer				
15.9.1	25 mm	10	Nos.	2100	21000
15.9.2	20 mm	10	Nos.	1800	18000
15.10	Ball valve without strainer				
15.10.1	25 mm	10	Nos.	1200	12000
15.10.2	20 mm	10	Nos.	1000	10000
15.11	Supply, installation, testing and commissioning cooling thermostats :-				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
15.11.1	For AHUs	67	Nos.	4317	289239
15.11.2	For FCUs	75	Nos.	1727	129525
16.0	DRAIN PIPING				
	Supply, laying/fixing, testing and commissioning of G.I. medium class ERW piping confirming to IS:1239 with necessary clamps, supports, anti vibration mountings, hangers and fittings such as bends, tees, reducers etc. duly insulated and painted as per specifications for condensate drain from air handling units and chillers etc.				
16.1.1	50 mm dia	200	RM	674	134800
16.1.2	40 mm dia	150	RM	524	78600
16.1.3	32 mm dia	100	RM	460	46000
16.1.4	25 mm dia	100	RM	375	37500
17.0	On-line non-chemical water treatment system				
17.1	Supply, Installation, Testing and Commissioning of On line, Non-Chemical Water Treatment Scale Preventor System : for 500 TR AC Chiller, having flow rate 1500 USGPM	4	Nos.	450000	1800000
C)	<u>AIR DISTRIBUTION</u>				
18.0	GSS DUCTING				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
	Supply, installation, testing, commissioning and balancing of G.S.S ducting of following thickness including necessary supports, hangers, nut bolts, gaskets, splitter dampers, vanes canvass connections etc. complete as per specifications & drawings:				
18.1	1.25 mm (18 G) GSS 275 GSM	5000	Sqm.	1350	6750000
18.2	1.25 mm (18 G) GSS 120 GSM	2000	Sqm.	1101	2202000
18.3	1.0 mm (20 G) GSS 120 GSM	3500	Sqm.	912	3192000
18.4	0.80 mm (22 G) GSS 120 GSM	5500	Sqm.	743	4086500
18.5	0.63 mm (24 G) GSS 120 GSM	9500	Sqm.	622	5909000
19.0	ALUMINIUM DUCTING				
	Supply, fabrication, installation and testing of aluminium ducts in accordance with the approved shop floor drawing and specifications. Material should confirm to IS 737 latest edition.				
19.1	22 gauge	2000	Sqm.	762	1524000
19.2	20 gauge	500	Sqm.	929	464500
19.3	18 gauge	180	Sqm	1199	215820
20.0	FIRE DAMPERS				
	Supply, installation, testing and commissioning of motorized combined smoke & fire dampers made out of GI sheet of at least 120 minutes fire rating complete with GI damper of required size, smoke sensor, etc as per specifications and shop drawings.				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
20.1	Fire/smoke Damper	72	Sqm	8559	616248
20.2	Actuator & control panel	134	sets	10698	1433532
21.0	VOLUME CONTROL DAMPERS				
	Supply, installation and testing of volume control dampers of GI sheet, box type to be provided in ducts complete with suitable links, levers and quadrants for manual control of air volume and air balancing as per specifications and drawings.	90	Sqm.	5135	462150
22.0	CEILING DIFFUSERS				
22.1	Supply, Installation, testing and balancing of square/circular supply air diffusers of powder coated aluminium construction with attached volume control dampers as per specs. and drawings.	25	Sqm.	8984	224600
22.2	Supply, installation, testing and balancing of square/circular return air diffusers of powder coated aluminium construction without volume control dampers as per specifications and drawings	25	Sqm.	6631	165775
22.3	Supply, installation, testing and commissioning of powder coated extruded aluminium Jet diffuser of various sizes with adjustable valves and complete as per specifications.	6	Sqm.	8000	48000
23.0	GRILLES				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
23.1	Supply, installation, testing and balancing of supply/return air grilles with/without volume control dampers of powder coated aluminium construction suitable for installation in walls, false ceiling boxing etc as per specifications and drawings.				
23.1.1	Supply air grilles in single louvers with volume control dampers.	26	Sqm.	8449	219674
23.1.2	Return air grilles in single louvers without volume control dampers.	26	Sqm.	4652	120952
23.2	Supply, installation, testing and balancing of powder coated extruded M.S. Air Grilles with / without volume control dampers.				
23.2.1	Supply air grilles in single louvers with volume control dampers.	35	Sqm.	8000	280000
23.2.2	Exhaust air grilles in single louvers without volume control dampers.	35	Sqm.	4500	157500
23.2.3	Painted metal jali with M.S. frames for the duct termination in the blower room.	15	Sqm.	1765	26475
24.0	LINEAR GRILLES				
	Supply, installation, testing and balancing of air linear grilles of powder coated aluminium construction suitable for installation in walls/false ceiling, boxing etc as per specifications and drawings.	15	Sqm.	4706	70590
25.0	GRILLE DAMPERS				
25.1	Supply, installation and balancing of aluminium construction volume control dampers for linear grills.	15	Sqm.	3797	56955

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
26.0	LAMINAR FLOW DIFFUSERS				
26.1	Providing & fixing of stainless steel plenum duly reinforced and made 100% air tight complete with 55% free perforated grilles(18 Gauge SS) at bottom for laminar flow in OTs. The plenum shall be insulated with 15 mm closed cell polyethylene insulation & shall be manufactured & installed by specialised agency as per designed to be approved by customer/Consultant				
	Size: 1200 x 600	156	Nos.	10499	1637844
26.2	Providing & fixing of aluminium powder coated grilles with 60% face area. The grill shall be complete with damper & complete 25 mm thick aluminium filters	20	Sqm	8000	160000
27.0	FRESH AIR GRILLES with bird screen				
27.1	Supply, installation,testing and balancing of extruded aluminium fresh air grilles with louvers and bird screen as per specification and drawings.(for fresh air supply during fire)	20	Sqm.	6300	126000
27.2	Supply, installation,testing and balancing of extruded aluminium exhaust air grilles with louvers and bird screen as per specification and drawings.	20	Sqm.	6417	128340

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
27.3	Supply, installation, testing, commissioning and balancing of fresh air opening comprising of powder coated extruded aluminium louvers with bird screen, projection with frame and volume control damper with lever mounting arrangement etc. as per specifications and drawings.	20	Sqm.	8300	166000
28.0	Pan type Humidifier				
28.1	Supply, installation, testing and commissioning of electric pan type humidifiers in each Air Handling Rooms to provide humidification during winter months heating operation. The humidifier shall evaporate 12 liters water per hour and complete with all required water valves incoming MCB, humidistat and ,electrical & control wiring and earthing as required.	11	Sets	27431	301742
28.2	6 KW	13	Sets	26073	338945
29.0	DUCT INSULATION				
29.1	Supply and fixing of 18 mm thick foil faced FR Closed Cell Chemically Crossed Linked Poly Ethylene Foam insulation (fire retardant and self extinguishing type) density not less than 32 Kg/cu M, thermal conductivity not more than 0.032 W/mK with adhesive tape etc. on ducts complete for supply /return air ducting as per the specifications and approved shop drawings.	18000	Sqm.	449	8082000

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
29.2	Supply and fixing of 18 mm thick foil faced and UV protected FR Closed Cell Chemically Crossed Linked Poly Ethylene Foam insulation (fire retardant and self extinguishing type) density not less than 32 Kg/cu M, thermal conductivity not more than 0.032 W/mK with adhesive tape etc. on ducts complete for supply air ducting as per the specifications and approved shop drawings.	200	Sqm.	662	132400
30.0	ACOUSTIC				
30.1	DUCT ACOUSTIC LINING				
	Supplying and fixing of acoustic lining of duct with fibre glass rigid board of density 48 Kg/m ³ sealed in fibre glass tissue paper and covered with 0.5 mm thick perforated aluminium sheet as per specifications.				
30.1.1	12 mm thick fibre glass rigid board.	500	Sqm.	499	249500
30.1.2	25 mm thick fibre glass rigid board.	2000	Sqm.	699	1398000
	Note:- No lining inside supply / return duct or plenum shall be done if the airside system is equipped with hepa filters.				
30.2	PLANT ROOMS ACOUSTIC INSULATION				
	Supply and fixing of acoustic insulation on walls and ceiling of Air handling units rooms with 50 mm thick resin bonded fibre glass slabs fixed in frame work and finished with vapour barrier and perforated aluminium sheet complete as per specifications and drawings.	3000	Sqm.	954	2862000
D)	ELECTRICAL				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
31.0	AIR- CONDITIONING PANELS				
	All bill of items are to be read in conjunction with specifications and drawings.				
	All outgoing shall be provided with Stop / Manual /Auto selector switch to facilitate operation through BAS. All starters shall be provided with suitable potential free Contacts for Connections to Building Automation System.				
	Emergency Block				
	Supply, installation, testing and commissioning of A/C panels suitable for 415 V, 3 phase, 4 wires, 50 Hz power distribution system. The panel shall be cubicle non draw out type free standing floor mounting sheet metal enclosed flush front with aluminium busbars, separate earth bus bars to be provided throughout the length of the panel. The incoming & outgoing feeder breakers, fuses, indicating lamps etc. shall be accommodated in a modular multitier arrangement. The painting shall be done as per relevant IS codes as specified in the specifications. Adequate size cable alley shall be provided all round the panel and in the back for each cable bending and termination. The outgoing feeders inside the panel shall be connected through solid bus bar. Flexible cable links are not acceptable. Bus bars shall be provided with sleeves or heat resistant insulated paint. The panel shall be suitable for cable entry from top. The panel shall be fabricated after the approval of fabrication drawings. All the panels shall have minimum 20% spare capacity.				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
	i)All switches to be heavy duty type base mounted having operating handle.				
	ii) BMS compatible with BACnet protocol				
31.1	Main/ Emergency Air-conditioning MCC in plant room in basement (Emergency Block)				
	INCOMER				
	2 No. 2500A, 415/500V, Motorised, Fully Drawout type (EDO), Four Pole, Air Circuit Breaker with microprocessor based overload, short circuit, Instantaneous & earth Fault trip including under voltage release and lockable trip push button. The ACB should have I _{cw} = I _{cs} = 50KA for 1 sec.R, Y & B Phase indicating lamps (LED type) with 2A control SP MCBs.Digital multi function meter with one set of suitable CTs, CT shorting links, R/Y/B LED indicating lamps and 2A cobntrol SP MCBs.				
	1 set of indicating lamps to indicate OPEN, CLOSE, TRIP.				
	Push button to CLOSE the ACB.				
	1 Set of A meter with ASS and CTs.				
	All ACBs should be computer compatible.				
	BUSBARS :5000 TPN				
	Bus Coupler				
	1 No. 2500A, 415/500V, Motorised, Fully Drawout type (EDO), Four Pole, Air Circuit Breaker with microprocessor based overload, short circuit, Instantaneous & earth Fault trip including under voltage release and lockable trip push button. The ACB should have I _{cw} = I _{cs} = 35KA for 1 sec.				
	1 set of indicating lamps to indicate OPEN, CLOSE, TRIP.				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
	Push button to CLOSE the ACB.				
	1 Set of A meter with ASS and CTs.				
	All ACBs should be computer compatible.				
	OUTGOING				
	4 No. 1000A, 415/500V, Motorised, Fully Drawout type (EDO), Four Pole, Air Circuit Breaker with microprocessor based overload, short circuit, instantanoious & earth Fault trip including under voltage release and lockable trip push button. The ACB should have Icw=Ics=35 KA for 1 sec.1 set of indicating lamps to indicate OPEN, CLOSE, TRIP.1 set of indicating lamps to indicate OPEN, CLOSE, TRIP.Push button to CLOSE the ACB. 1 Set of A meter with ASS and CTs. For Water chilling machines.				
	3 nos 1000 Amp 415 volts, 35 KA (Isc), FP MCCB microprocessor based having variable current settings .Extended rotary operating mechanism with door interlock with defeat feature and padlock facility. MCCB should be with spreader link and phase barriers.Indicating lamps with 2A protection MCBs to indicate OPEN, CLOSE, TRIP for MCCB.Ampere Metre of suitable range with suitable set of CT's and ASS.For hot water genetators.(3W)				
	2 nos 630 Amp 415 volts, 35 KA (Isc), FP MCCB microprocessor based having variable current settings of .Extended rotary operating mechanism with door interlock with defeat feature and padlock facility. MCCB should be with spreader link and phase barriers.Indicating lamps with 2A protection MCBs to indicate OPEN, CLOSE, TRIP for MCCB.Ampere Metre of suitable range with suitable set of CT's and ASS.For hot water genetators.				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
	4 Nos. 300 Amp 415 volts, 35 KA (Isc), FP MCCB microprocessor based having variable current settings .Extended rotary operating mechanism with door interlock with defeat feature and padlock facility. MCCB should be with spreader link and phase barriers.Indicating lamps with 2A protection MCBs to indicate OPEN, CLOSE, TRIP for MCCB.Ampere Metre of suitable range with suitable set of CT's and ASS with fully automatic star delta starter suitable for 75 hp condenser water pumps.				
	4 Nos. 125 Amp 415 volts, 35 KA (Isc), FP MCCB with thermal magnetic release having variable current settings Extended rotary operating mechanism with door interlock with defeat feature and padlock facility. MCCB should be with spreader link and phase barriers.Indicating lamps with 2A protection MCBs to indicate OPEN, CLOSE, TRIP for MCCB.Ampere Metre of suitable range with suitable set of CT's and ASS with fully automatic star delta starter suitable for 35 hp Primary chilled water pumps.				
	4 Nos. 300 Amp 415 volts, 35 KA (Isc), FP MCCB with thermal magnetic release having variable current settings .Extended rotary operating mechanism with door interlock with defeat feature and padlock facility. MCCB should be with spreader link and phase barriers.Indicating lamps with 2A protection MCBs to indicate OPEN, CLOSE, TRIP for MCCB.Ampere Metre of suitable range with suitable set of CT's and ASS with fully automatic star delta starter suitable for 75 hp Secondary chilled water pumps.				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
	2 Nos. 63 Amp 415 volts, 35 KA (Isc), FP MCCB with thermal magnetic release having variable current settings .Extended rotary operating mechanism with door interlock with defeat feature and padlock facility. MCCB should be with spreader link and phase barriers.Indicating lamps with 2A protection MCBs to indicate OPEN, CLOSE, TRIP for MCCB.Ampere Metre of suitable range with suitable set of CT's and ASS with fully automatic star delta starter suitable for 12.5 hp Hot water pumps.				
	12 Nos. 63 Amp 415 volts, 35 KA (Isc), FP MCCB with thermal magnetic release having variable current settings .Extended rotary operating mechanism with door interlock with defeat feature and padlock facility. MCCB should be with spreader link and phase barriers.Indicating lamps with 2A protection MCBs to indicate OPEN, CLOSE, TRIP for MCCB.Ampere Metre of suitable range with suitable set of CT's and ASS with fully automatic star delta starter suitable for 10 hp cooling towers.				
	6 Nos. 32 Amp 415 volts, 10 KA , FP MCCB with thermal magnetic release having variable current settings. Extended rotary operating mechanism with door interlock with defeat feature and padlock facility. MCCB should be with spreader link and phase barriers.Indicating lamps with 2A protection MCBs to indicate OPEN, CLOSE, TRIP for MCCB.Ampere Metre of suitable range with suitable set of CT's and ASS.				
	5 No. 16 Amps 415 MCCB 10 KA for, ON-OFF indication lamps with push button,ammeter with ASS and CTs.				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
	Complete panel as above	1	Panel	5830105	5830105
31.2	Distribution Panels				
	Emergency Block				
31.2.1	AHP -BF 1-01, BF-02 ,BF-03				
	INCOMER :				
	1 No. 160 Amps 25 KA FP MCCB, 1 no of 0-100 amp ammeter with selector switch & CT's , 1 no. 0-500 volt voltmeter with selector switch & fuses , 1set of indicating lights (RYB).				
	Bus Bar				
	200 A TPN Aluminium bus bar 415V , 50 Hz.				
	OUTGOINGS :				
	4 set - 63 A, 415 V 15 KA FP MCCB .				
	2 set - 32 A, 415 V 15 KA FP MCCB .				
	2 set - 16 A, 415 V 10 KA FP MCCB .				
	6 set 16 A, FP MCB				
	3 set 32 A, FP MCB				
	Complete panel as above	11	Panel	137300	1510300

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
31.2.2	AHP -BF 1-02				
	INCOMER :				
	1 No. 100 Amps 25 KA FP MCCB, 1 no of 0-100 amp ammeter with selector switch & CT's , 1 no. 0-500 volt voltmeter with selector switch & fuses , 1set of indicating lights (RYB).				
	Bus Bar				
	160 A TPN Aluminium bus bar 415V , 50 Hz.				
	OUTGOINGS :				
	3 set - 63 A, 415 V 15 KA FP MCCB .				
	1 set - 32 A, 415 V 15 KA FP MCCB .				
	1 set - 16 A, 415 V 10 KA FP MCCB .				
	6 set 16 A, FP MCB				
	3 set 32 A, FP MCB				
	Complete panel as above	1	Panel	95100	95100
31.2.3	AHP - GF				
	INCOMER :				
	1 No. 250 Amps 25 KA FP MCCB, 1 no of 0-100 amp ammeter with selector switch & CT's , 1 no. 0-500 volt voltmeter with selector switch & fuses , 1set of indicating lights (RYB).				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
	Bus Bar				
	300 A TPN Aluminium bus bar 415V , 50 Hz.				
	OUTGOINGS :				
	8 set - 63 A, 415 V 15 KA FP MCCB .				
	2 set - 32 A, 415 V 15 KA FP MCCB .				
	2 set - 16 A, 415 V 10 KA FP MCCB .				
	6 set 16 A, FP MCB				
	3 set 32 A, FP MCB				
	Complete panel as above	1	Panel	209200	209200
31.2.4	AHP - FF, SF				
	INCOMER :				
	1 No. 250 Amps 25 KA FP MCCB, 1 no of 0-100 amp ammeter with selector switch & CT's , 1 no. 0-500 volt voltmeter with selector switch & fuses , 1set of indicating lights (RYB).				
	Bus Bar				
	300 A TPN Aluminium bus bar 415V , 50 Hz.				
	OUTGOINGS :				
	2 set - 100 A, 415 V 15 KA FP MCCB .				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
	3 set - 63 A, 415 V 15 KA FP MCCB .				
	2 set - 32 A, 415 V 15 KA FP MCCB .				
	2 set - 16 A, 415 V 10 KA FP MCCB .				
	6 set 16 A, FP MCB				
	3 set 32 A, FP MCB				
	Complete panel as above	2	Panel	144000	288000
31.2.5	AHP - TF				
	INCOMER :				
	1 No. 320 Amps 25 KA FP MCCB, 1 no of 0-100 amp ammeter with selector switch & CT's , 1 no. 0-500 volt voltmeter with selector switch & fuses , 1set of indicating lights (RYB).				
	Bus Bar				
	350 A TPN Aluminium bus bar 415V , 50 Hz.				
	OUTGOINGS :				
	2 set - 100 A, 415 V 15 KA FP MCCB .				
	6 set - 63 A, 415 V 15 KA FP MCCB .				
	5 set - 32 A, 415 V 15 KA FP MCCB .				
	2 set - 16 A, 415 V 10 KA FP MCCB .				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
	6 set 16 A, FP MCB				
	3 set 32 A, FP MCB				
	Complete panel as above	2	Panel	274200	548400
31.2.6	AHP - Terrace Floor				
	INCOMER :				
	1 No. 160 Amps 25 KA FP MCCB, 1 no of 0-100 amp ammeter with selector switch & CT's , 1 no. 0-500 volt voltmeter with selector switch & fuses , 1set of indicating lights (RYB).				
	Bus Bar				
	200 A TPN Aluminium bus bar 415V , 50 Hz.				
	OUTGOINGS :				
	5 set - 32 A, 415 V 15 KA FP MCCB .				
	10 set - 16 A, 415 V 10 KA FP MCCB .				
	6 set 16 A, FP MCB				
	3 set 32 A, FP MCB				
	Complete panel as above	1	Panel	230000	230000
32.0	AHU STARTER PANELS				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
	Supply, installation, testing and commissioning of cubicle type totally enclosed wall/floor mounted free standing type, dust, damp and vermin proof for AHU made of 2mm thick CRCA sheet steel in compartmentalized design as per specification and drawings. These distribution boards shall be mounted on 50x50x6 MS angle frame work grouted to floor/walls of recessed. The rate includes the angle iron frame, support, painting, numbering, earthing etc. as required				
32.1	AHU STARTER PANEL (For OT's and critical areas)				
	INCOMER :				
	1 No. 63 Amps 25 KA FP MCCB, 1 no of 0-100 amp ammeter with selector switch & CT's , 1 no. 0-500 volt voltmeter with selector switch & fuses , 1set of indicating lights (RYB).				
	Bus Bar				
	100 A TPN Aluminium bus bar 415V , 50 Hz.				
	OUTGOINGS :				
	1 set - 32 A, 415 V 15 KA FP MCCB, single phase preventor, suitable starter for 5.0 /7.5 HP motor with thermal overload protection and spare NO-NC contacts for interlocking, ON-OFF indication lamps with push button for AHU motor as required.				
	1 set - 32 A, 415 V 15 KA FP MCCB, contactors of suitable rating for each bank , ON-OFF indication lamps for winter humidifier.				
	1 set - 32 A, 415 V 15 KA FP MCCB , as spares.				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
	1 set - 16 A, 415 V 10 KA FP MCCB .				
	2 set 16 A, FP MCB				
	2 set 32 A, FP MCB				
	Complete panel as above	13	Panel	74800	972400
32.2	AHU STARTER PANEL (For wards)				
	INCOMER :				
	1 No. 100 Amps 25 KA FP MCCB, 1 no of 0-100 amp ammeter with selector switch & CT's , 1 no. 0-500 volt voltmeter with selector switch & fuses , 1set of indicating lights (RYB).				
	Bus Bar				
	125 A TPN Aluminium bus bar 415V , 50 Hz.				
	OUTGOINGS :				
	1 set - 63 A, 415 V 15 KA FP MCCB, single phase preventor, suitable starter for 12.5/15 HP motor with thermal overload protection and spare NO-NC contacts for interlocking, ON-OFF indication lamps with push button for AHU motor as required.				
	1 set - 63 A, 415 V 15 KA FP MCCB, contactors of suitable rating for each bank , ON-OFF indication lamps for winter humidifier.				
	1 set - 63 A, 415 V 15 KA FP MCCB .				
	1 set - 16 A, 415 V 10 KA FP MCCB .				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
	2 set 16 A, FP MCB				
	2 set 32 A, FP MCB				
	Complete panel as above	6	Panel	97200	583200
32.3	AHU STARTER PANEL (For wards)				
	INCOMER :				
	1 No. 160 Amps 25 KA FP MCCB, 1 no of 0-100 amp ammeter with selector switch & CT's , 1 no. 0-500 volt voltmeter with selector switch & fuses , 1set of indicating lights (RYB).				
	Bus Bar				
	160 A TPN Aluminium bus bar 415V , 50 Hz.				
	OUTGOINGS :				
	1 set - 100 A, 415 V 15 KA FP MCCB, single phase preventor, suitable starter for 20/25 HP motor with thermal overload protection and spare NO-NC contacts for interlocking, ON-OFF indication lamps with push button for AHU motor as required.				
	1 set - 63 A, 415 V 15 KA FP MCCB, contactors of suitable rating for each bank , ON-OFF indication lamps for winter humidifier.				
	1 set - 100 A, 415 V 15 KA FP MCCB , as spares.				
	1 set - 63 A, 415 V 15 KA FP MCCB .				
	1 set - 16 A, 415 V 10 KA FP MCCB .				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
	2 set 16 A, FP MCB				
	2 set 32 A, FP MCB				
	Complete panel as above	6	Panel	117800	706800
32.4	AHU STARTER PANEL				
	1 No. 63 Amps MCCB 10 KA for 25 HP Motor with suitable Starters for motor with thermal overload protection,single phase preventor,spare NO_NC contacts for interlocking, ON-OFF indication lamps with push button,ammeter with ASS and CTs for fan motor as required.	5	Nos.	30413	152065
32.5	AHU STARTER PANEL				
	1 No. 63 Amps MCCB 10 KA for 20 HP Motor with suitable Starters for motor with thermal overload protection,single phase preventor,spare NO_NC contacts for interlocking, ON-OFF indication lamps with push button,ammeter with ASS and CTs for fan motor as required.	1	Nos.	30413	30413
32.6	AHU STARTER PANEL				
	1 No. 63 Amps MCCB 10 KA for 15 HP Motor with suitable Starters for motor with thermal overload protection,single phase preventor,spare NO_NC contacts for interlocking, ON-OFF indication lamps with push button,ammeter with ASS and CTs for Air Washer motor as required.	2	Nos.	23379	46758

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
32.7	AHU/FAN STARTER PANEL				
	1 No. 63 Amps MCCB 10 KA for 12.5 HP Motor with suitable Starters for motor with thermal overload protection, single phase preventor, spare NO_NC contacts for interlocking, ON-OFF indication lamps with push button, ammeter with ASS and CTs for AHU/Fan motor as required.	20	Nos.	23379	467580
32.8	AHU/FAN STARTER PANEL				
	1 No. 32 Amps MCCB 10 KA for 10 HP Motor with suitable Starters for motor with thermal overload protection, single phase preventor, spare NO_NC contacts for interlocking, ON-OFF indication lamps with push button, ammeter with ASS and CTs for AHU/Fan motor as required.	23	Nos.	23379	537717
32.9	AHU/FAN STARTER PANEL				
	1 No. 32 Amps MCCB 10 KA for 7.5 HP Motor with suitable Starters for motor with thermal overload protection, single phase preventor, spare NO_NC contacts for interlocking, ON-OFF indication lamps with push button, ammeter with ASS and CTs for AHU/Fan motor as required.	9	Nos.	18093	162837
32.1	AHU/FAN STARTER PANEL				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
	1 No. 16 Amps MCCB 10 KA for 5 HP Motor with suitable Starters for motor with thermal overload protection, single phase preventor, spare NO_NC contacts for interlocking, ON-OFF indication lamps with push button, ammeter with ASS and CTs for AHU motor as required.	15	Nos.	18093	271395
32.11	AHU/FAN STARTER PANEL				
	1 No. 16 Amps MCCB 10 KA for 3 HP Motor with suitable Starters for motor with thermal overload protection, single phase preventor, spare NO_NC contacts for interlocking, ON-OFF indication lamps with push button, ammeter with ASS and CTs for AHU/Fan motor as required.	27	Nos.	16810	453870
32.12	AHU/FAN STARTER PANEL				
	1 No. 16 Amps MCCB 10 KA for 2 HP Motor with suitable Starters for motor with thermal overload protection, single phase preventor, spare NO_NC contacts for interlocking, ON-OFF indication lamps with push button, ammeter with ASS and CTs for AHU/Fan motor as required.	1	Nos.	16180	16180
32.13	AHU/FAN STARTER PANEL				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
	1 No. 16 Amps MCCB 10 KA for 1.5 HP Motor with suitable Starters for motor with thermal overload protection, single phase preventor, spare NO_NC contacts for interlocking, ON-OFF indication lamps with push button, ammeter with ASS and CTs for AHU/Fan motor as required.	2	Nos.	16180	32360
32.14	AHU/FAN STARTER PANEL				
	1 No. 16 Amps MCCB 10 KA for 1/0.75/0.5 HP Motor with suitable Starters for motor with thermal overload protection, single phase preventor, spare NO_NC contacts for interlocking, ON-OFF indication lamps with push button, ammeter with ASS and CTs for AHU/Fan motor as required.	2	Nos.	16744	33488
33.0	CABLING				
33.1	Supplying, laying, effecting proper connections, testing & commissioning of following size of 1.1 kv PVC insulated aluminium conducting armoured cables as per IS 1554 Part- 1 laid underground/cable tray/on surface of wall/hume pipe etc. & termination with brass compression glands as required.				
33.1.1	3.5Cx 400 sq.mm cable	600	Mtr	2600	1560000
33.1.2	3.5Cx 300 sq.mm cable	600	Mtr	2285	1370825
33.1.3	3.5Cx 240 sq.mm cable	800	Mtr	1875	1499966
33.1.4	3.5C x 185 sq.mm cable	400	Mtr	1480	592068

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
33.1.5	3.5C x 150 sq.mm cable	400	Mtr	1215	486177
33.1.6	3.5C x 120 sq.mm cable	400	Mtr	1026	410212
33.1.7	3.5C x 95 sq.mm cable	400	Mtr	811	324578
33.1.8	3.5C x 70 sq.mm cable	300	Mtr	661	198200
33.1.9	3.5C x 50 sq.mm cable	120	Mtr	473	56767
33.1.10	3.5C x 35 sq.mm cable	200	Mtr	392	78418
33.1.11	4Cx 25 sq.mm Cable	200	Mtr	323	64565
33.1.12	4 C X 16 sq. mm. Cable	150	Mtr	265	39704
33.1.13	4 C X10 sq. mm. Cable	600	Mtr	240	143973
33.1.14	4 C X 6 sq. mm. Cable	800	Mtr	187	149416
33.1.15	4 C X 4 sq. mm. Cable	1200	Mtr	160	191470
33.1.16	3C X6 sq. mm. Cable	350	Mtr	187	65369
34.0	CABLE TRAYS				
	Supply & installation of following sizes of perforated MS cable trays including horizontal & vertical bends, reducers, tees, cross members and other accessories as required and duly supported from the ceiling/wall/floor with MS suspenders/supports and including painting etc. as required				
34.1	300 mm widthx50 mm deep x1.6 mmthickness	1000	Mtr	900	900000

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
34.2	200 mm widthx50 mm deep x1.6 mmthickness	800	Mtr	750	600000
34.3	150 mm widthx50 mm deep x1.6 mmthickness	800	Mtr	400	320000
34.4	100 mm widthx50 mm deep x1.6 mmthickness	750	Mtr	300	225000
35.0	EARTHING				
35.1	Earth pits with GI earth plate of size 600mmx600mmx6mm thick including all accessories , down watering GI pipes 40mm dia and providing masonry enclosure with cover plate having interlocking arrangement and watering pipe etc. with charcoal of or coke and salt) complete as required	4	Set	15000	60000
35.2	Providing & fixing GI earth strip 40mm x 6mm on surface or in recess for earth connections etc. as required	250	Mtr	250	62500
35.3	Providing and fixing GI earth strip on walls/ trenches complete as per specifications and as required.				
35.3.1	38mmx 6mm	250	Mtr	140	35000
35.3.2	25mm x 3mm	400	Mtr	125	50000
35.4	Providing and fixing earth wire of complete as per specifications as required.				
35.4.1	4 SWG wire	100	Mtr	100	10000

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
35.4.2	6 SWG wire	1200	Mtr	75	90000
35.4.3	8 SWG wire	1000	Mtr	60	60000
36.0	CONTROL CABLING				
	Supply, laying, effecting proper connections, testing & commissioning of 1.5 sq.mm. PVC insulated copper multicore cables from AHU's and AC equipments to central control console				
36.1	27 core cable	500	Mtr	836	417788
36.2	19 core cable	500	Mtr	639	319283
36.3	14 core cable	1000	Mtr	517	517090
36.4	10 core cable	2000	Mtr	452	903126
36.5	8 core cable	400	Mtr	336	134298
36.6	6 core cable	400	Mtr	282	112607
36.7	5 core cable	600	Mtr	255	152835
36.8	3 core cable	200	Mtr	255	51000
36.9	2 core cable	500	Mtr	255	127500
37.0	CONTROL CONSOLE /DESK				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
	Supplying, installation, testing & commissioning of floor mounted desk type control console cum indicating panel in the A.C. plant room containing various indications and controls for the complete air-conditioning system comprising chilling units, chilled/ Hot/ condenser water pumps, cooling towers and AHUs/ Ex. blower/ Fans etc , Hot water boiler with test push button facility. The panel shall be fabricated from minimum 1.6mm thick M.S. powder coated sheet of approved design. The air-conditioning module of the central control cum indicating panel shall contain the following accessories.				
	Status indication (ON, OFF & fault) of each compressor for each chilling machine, hot water boiler etc.				
	Push buttons and indicating lamps for remote start & stop and status indication for every nos of the water circulating pumps, Air Handling Units, Ex blower, Fans etc.				
	Push buttons and indication lamps for remote start & stop and status indication (On, Off & Fault) for every nos. cooling tower motors and low water level indication for every Nos. cooling towers.				
	Hooter and flashing lamp to indicate operation of any safety/ shut down with necessary contactors, accept, reset and test push buttons.				
	Complete wiring with copper conductor PVC insulated multicore 2.5 sq.mm stranded cable (excluding supply of cable, tray, clamps etc) from various equipments in the A.C. plant room, AHU's Terrace plant room and cooling towers etc to the control console panel as required.				

Item No. 1	Description 2	Qty 3	Unit 4	Rate In Rs. (in Figure) 5	Amount (Rs.) 7
	Complete Panel As above for Following blocks				
37.1	For Emergency	1	Panel	692308	692308
	TOTAL FOR HVACWORKS				194382911

	<u>EMERGENCY BLOCK, SAFDARJANG HOSPITAL, NEW DELHI</u>		
	<u>REVISED SUMMARY SHEET FOR HVAC WORKS</u>		
SECTION	DESCRIPTION OF WORK		AMOUNT(Rs.)
A	EQUIPMENTS		103551238
B	PIPING		20772420
C	AIR DISTRIBUTION		43809042
D	ELECTRICAL		26250212
	GRAND TOTAL		194382911