

MUNICIPAL CORPORATION OF GREATER MUMBAI

PROPOSED BMC GENERAL HOSPITAL & STAFF QUARTERS

On Plot bearing CTS No. 11A/4,Chandivali, Sangharsha Nagar, Kurla - 400072

SUMMARY - HVAC

Sr. No.	Description	Amount
1	HVAC HOSPITAL BUILDING	₹ 18,85,81,415.00
	Grand Total	₹ 18,85,81,415.00

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PROPOSED BMC GENERAL HOSPITAL & STAFF QUARTERS

On Plot bearing CTS No. 11A/4,Chandivali, Sangharsha Nagar, Kurla 400072

BILL OF QUANTITIES HVAC WORKS

SR.NO	REF. CODE	DESCRIPTION	QTY	UNIT	S/I/T/C RATE	S/I/T/C TOTAL AMOUNT
		Water Cooled Type Oil Free Centrifugal Chiller Package with Magnetic Levitation Motor including Chiller Plant Manager and Building control Unit for Integration with External BMS & One Chiller Factory Testing Visit.				
1		Supply, installation, testing & commissioning of AHRI / EUROVENT certified imported Water-cooled oil free centrifugal chiller Units,complete with oil free centrifugal compressor with magnetic bearings, Falling Film type Evaporator, water cooled condenser, Control panel etc. The chiller shall be charged with R134a Refrigerant. Evaporator and condenser vessel shall be designed, tested and stamped for ASME section VIII. The drive motor suitable for 415V +/- 5%, 3 phase, 50 cycles/sec. The chiller should be insulated as per manufacturers standard. The chiller shall have unit mounted microprocessor based Variable frequency starter. Chiller should be supplied with a unit mounted UPS (Uninterruptible Power Supply) to prevent damage to the bearings by supplying electric energy stably without time to change the motor to the generator in case of power failure. Micro-processor based controls with alpha-numeric display in English for all operating parameters such as chilled water inlet, chilled water outlet,operating pressures etc. Flange / Grooved connection shall be part of the Chiller Package. Compressor shall be able to unload up to 25% of the total load. Chiller should be inline with the Technical				
	MTA-AC-1	Ref. Capacity - 270 TR (Actual) (2W+1St.By.)	3.00	Nos.	1,11,55,375.00	3,34,66,125.00
		Chilled Water Inlet Temp - 13.3°C				
		Chilled Water Outlet Temp - 6.7°C				
		Cooling Water Inlet Temp - 32.0°C				
		Cooling Water Outlet Temp - 37.5°C				
		Chiller Fouling Factor - 0.000044 m ² °C/W				
		Condenser Fouling Factor - 0.000088 m ² °C/W				
		Minimum COP at AHRI Relief ≥ 6.5				
		Minimum IPLV at AHRI Relief ≥ 9.5				
		Sound Pressure Level @ 3m - 75 db(A)				
		Refrigerant - HFC				
		Max pressure drop on chiller : 3.0m (Max)				
		Max pressure drop on condenser : 4.0m (Max)				
2	MTA-AC-3	SITC Restrained Spring Isolators Vibration Isolator Of Approved MakeRequired For Primary, Secondary Pumps, Cooling Water Pumps Suitable Fortheir Operating Weight In Rating. Spring elements shall have a lateral stiffness greater than 1.2 times the rated verticalstiffness and shall be designed to provide a minimum of 50% overloadcapacity. Non-welded spring elements shall be polyester powder coated, and shall have a 1000 hr rating when tested in accordance with ASTM B-117. Springs shall be deflections as per operating load design of equipment	50.00	Nos.	6,118.00	3,05,900.00
3	R-AC-LTMG-NOPD-F65	SITC of Single Arch Rubber Bellow for Chillers Evaporator, Chillers Condenser, Primary Pump, Condenser Pump, Cooling Tower, Secondary Pump -- 200mm with Control Guide Assembly	36.00	Nos.	23,404.00	8,42,544.00
4	RAC-LTMG-NOPD-F65	SITC of Single Arch Rubber Bellow for Chillers Evaporator, Chillers Condenser, Primary Pump, Condenser Pump, Cooling Tower, Secondary Pump -- 250mm with Control Guide Assembly	6.00	Nos.	23,404.00	1,40,424.00
5	MTA-AC-13	Cooling Tower Multicell Type (CTI Certified) As Per Specification with following operating parameters : (2W+1St.By.)	3.00	Nos.	20,82,567.00	62,47,701.00
		Wet Bulb Temp. - 27.2° C				
		Entering Water Temp. - 32.0° C				
		Leaving Water Temp. - 37.5° C				
		Total Flow Rate - 1620 GPM (2W+1S)				

SR.NO	REF. CODE	DESCRIPTION	QTY	UNIT	S/I/T/C RATE	S/I/T/C TOTAL AMOUNT
6	MTA-AC-8	<p>Primary Water Pumps with the following parameters : Supply, Installation, Testing and Commissioning of Back Pull Out, Primary Centrifugal pump sets with Cast Iron casing & bronze Impeller & Shaft seals with TEFC motor suitable for 3 Phase, 415 V + 10 %, 50 c/s, AC Power supply, Necessary Cabling & Earthing Strip, mounted on common base frame etc. The pump shall be duly insulated, as per specifications.(2W+1St.By.) NOTE:- VENDOR TO VERIFY PUMP HEAD AS PER ACTUAL SITE CONDITION & SHOP DRAWINGS AND SUBMIT PUMP DATA SHEET FOR CONSULTANT'S APPROVAL PRIOR TO PURCHASE</p> <p>Technical Data : Water Quantity - 594 GPM Static Head - 16 meters Speed - 1450 RPM Impeller - Bronze</p>	3.00	Nos.	1,40,896.00	4,22,688.00
7	MTA-AC-9	<p>Secondary Chilled Water Pump set (Variable speed- VFD) Zone 1 & zone 2 Supply, Installation, Testing and Commissioning of Back Pull Out, Secondary Centrifugal pump sets with Cast Iron casing & bronze Impeller & Shaft seals with TEFC motor suitable for 3 Phase, 415 V + 10 %,50 c/s, AC Power supply mounted on common base frame etc. The pump shall be duly insulated, Micro-processor based variable frequency drive for chilled water secondary pumps, indicated above,comprising of sensors, transmitters, logic controllers suitably interfaced with motor, variable frequency drive, all accessories, control wiring, downloaded programmable software. The system shall be complete in all respect and suitable for following ratings: as per specification. NOTE:- VENDOR TO VERIFY PUMP HEAD AAS PER ACTUAL SITE CONDITION & SHOP DRAWINGS AND SUBMIT PUMP DATA SHEET FOR CONSULTANT'S APPROVAL PRIOR TO PURCHASE.</p> <p>SYSTEM - 1 (Basement to Fourth Floor) (2W+1St.By.)</p> <p>Technical Data : Water Quantity - 390 GPM Static Head - 26 meters (Zone-1) Speed - 1450 RPM Impeller - Bronze</p>	3.00	Nos	3,29,891.00	9,89,673.00
8	FAIR ITEM	<p>Flow rate:- Zone-2 = 270-USGPM (6th to 10th Floor) Head:- Zone-2 = 34-Mtr Efficiency (min):- 75%</p>	3.00	Nos	3,14,560.00	9,43,680.00
9	MTA-AC-12	<p>Cooling Water Pumps with the following parameters : Supply, Installation, Testing and Commissioning of Back Pull Out, Cooling Water Centrifugal pump sets with Cast Iron casing & bronze Impeller & Shaft seals with TEFC motor suitable for 3 Phase, 415 V + 10 %, 50 c/s, AC Power supply, Necessary Cabling & Earthing Strip, mounted on common base frame etc. The pump shall be duly insulated, as per specifications. (2W+1St.By.) NOTE:- VENDOR TO VERIFY PUMP HEAD AS PER ACTUAL SITE CONDITION & SHOP DRAWINGS AND SUBMIT PUMP DATA SHEET FOR CONSULTANT'S APPROVAL PRIOR TO PURCHASE</p> <p>Technical Data : Water Quantity - 810 GPM Static Head - 24 meters Speed - 1450 RPM Impeller - Bronze</p>	3.00	Nos.	2,20,828.00	6,62,484.00

SR.NO	REF. CODE	DESCRIPTION	QTY	UNIT	S/I/T/C RATE	S/I/T/C TOTAL AMOUNT
10	BAH-HVAC-FA-07	SITC of Triple Duty Valve Primary, Secondary and condenser pumps 200m dia Valve Furnish and install on the discharge side of each pump . Each valve is to incorporate the following three functions in one body: It features a calibrated balancevalve, non-slam check valve, and positive shut-off valve all rolled into one.Tight shut-off, spring-closure type silent non-slam check and effective throttling with flow measurement capability. The body shall have (2) 1/4" NPT connections on each side of the valve seat. Two connections to have brass pressure and temperature metering ports, with Nordel check valves and gasketed caps. Two other connections to be supplied with brass drain plugs. Metering ports are to be interchangeable with drain ports to allow for measurement flexibility when installed in tight locations. The valve disc shall be bronze plug & disc type with high impact engineered resin seat to ensure tight shut-off and silent check operation. The valve stem shall be stainless steel with flat surfaces provided for adjustment with open-end wrench. For Grooved Piping: Valve body shall be ductile iron with grooved ends and Armstrong anti-rotation Armgrip™ lugs on the inlet and outlet of the body. Flange adapters, where necessary, are to be PN16 or PN25 ductile iron flanges with antirotation lugs and EPT gaskets. For Welded Flange Piping: (For 10 bar flanges:) Valve body shall be Cast Iron with PN16 flanged ports. (For 20 bar flanges:) Valve body shall be Ductile Iron with PN25 flanged ports. The valve shall be selected and installed in accordance with the manufacturer's instructions and be suitable for the pressure and temperature specified.	12.00	Nos.	1,15,000.00	13,80,000.00
11	BAH-HVAC-FA-08	SITC of Suction Guide and strainer Primary, Secondary and condenser pumps 200m dia Valve Furnish and install on the suction of each pump an Suction Guide, with Outlet Flow Stabilizing Guide Vanes, removable Stainless Steel Strainer and Fine Mesh Start-up Strainer. (For 10 bar flanged pipe:) Supply valve with Cast Iron body with PN16 flanged ports. The mechanical contractor shall inspect the strainer prior to activating the pump and, further, shall remove the Fine Mesh Start-up Strainer after a short running period. (24 hours maximum). Space shall provided for removal of the Strainer and connection of a blow-down valve	12.00	Nos.	85,000.00	10,20,000.00
12	BAH-HVAC-FA-09	SITC of Automatic condenser Tube Cleaning system of suitable size including Touch Screen Graphical , injection/collection pump if required, actuator based valves and complete with all accessories .Sponge ball shall be injected continuously in condenser tubes with the help of automatic flapper operation and ball recirculation pump, initiated from the control panel; it would continue to be in operation unless & until stopped by operator from control panel. The actuator based valves shall give signals to PLC of their functioning and all process of injection and collection should be shown on the PLC while in operation. This system combine for all chillers.(3w+1std by) refer specification	1.00	Nos.	28,00,000.00	28,00,000.00
13	MTA-AC-6	Chiller Plant Manager to control Chillers, Primary Pumps, Cooling Water Pumps, Cooling Towers & Isolation Valves	1.00	Nos.	9,97,500.00	9,97,500.00
14	MTA-AC-5	Hardware & software required for integration of chiller microprocessor with BMS system	1.00	Job	24,399.00	24,399.00
		AIR HANDLING UNITS (SOR Items)				

SR.NO	REF. CODE	DESCRIPTION	QTY	UNIT	S/I/T/C RATE	S/I/T/C TOTAL AMOUNT
15	BAH-HVAC-FA-50	SITC of Chilled Water Ceiling Suspended Air Handling unit 8.00 TR/ 2600 CFM / 65MM ST.PR. / 10µ & 20µ COMBINATION FILTER / 3µ FILTER SUITABLE VFD RATING WITH AUTO BYPASS STARTER PANEL WITH 30% HARMONIC FILTER with thermal break profile and internal coving, double skin panels minimum 43±2 mm thick fabricated out pre-plasticized 22 swg GSS on outer side and plain 22 swg Galvanized sheet on inner side with PUF insulation density not less than 40 kg/m3 sandwiched between inner and outer sheet with internal 15mm acoustic insulation. The AHU shall comprise of Fresh Air Module with EU-4 filter and volume control damper, Mixing Chamber, EU-3 & EU-4 filter section with filters, Chilled Water Coil Section with min. 4/6/8 Row Chilled water coil, Metallic Moisture Eliminator Removable , Sliding Type Arrangement with access door, and SS drain pan, complete with Direct drive Plug type backward curve fan section with VFD with stater Panel (VFD to be supplied by AHU manufacturer) by High Energy Efficient (IE3) motor and assembly. EU-7 filter section with filters, Heating Coil with 4 Coil, Provision Space for Stand By Coil for OT AHU . AHU Dampers to be of Extruded Aluminum Low Leakage Aerofoil Volume Control Dampers with extended shaft suitable for Manual & Motorised operation & Necessary cabling & earthing strip. Limit switches for AHU doors, inspection lamps with fire proof Double Canvass connection (Fungal and Lint free). Junction box with contactor strip to be provided on the outer panel with positive isolation for electrical shock for heater connection.Fan static pressure shall be minimum 50 mm or higher if required to overcome actual pressure drop. Cooling coil to be selected as per minimum 500 FPM and 4/6/8 Row or as required to achieve required coil leaving conditions. Limit Switch, Lamp, Fire Damper etc control wiring to be given at one location on AHU.For detailed constructional feature, please refer Technical Annexure.The vendor shall comply with EN 1886-2007 for Casing Air Leakage (L2), Filter Bypass Leakage, Mechanical strength, Thermal Transmittance & Thermal BridgingSpecification to be read following sequence- GTH-AHU capacity & St. pressure in mm of water	1.00	Nos.	2,99,000.00	2,99,000.00
16	BAH-HVAC-FA-45	SITC of Chilled Water Ceiling Suspended Air Handling unit 5.00 TR / 1600 CFM / 40MM ST.PR. / 10µ & 20µ COMBINATION FILTER / SUITABLE VFD RATING WITH AUTO BYPASS STARTER PANEL WITH 30% HARMONIC FILTER with thermal break profile and internal coving, double skin panels minimum 43±2 mm thick fabricated out pre-plasticized 22 swg GSS on outer side and plain 22 swg Galvanized sheet on inner side with PUF insulation density not less than 40 kg/m3 sandwiched between inner and outer sheet with internal 15mm acoustic insulation. The AHU shall comprise of Fresh Air Module with EU-4 filter and volume control damper, Mixing Chamber, EU-3 & EU-4 filter section with filters, Chilled Water Coil Section with min. 4/6/8 Row Chilled water coil, Metallic Moisture Eliminator Removable , Sliding Type Arrangement with access door, and SS drain pan, complete with Direct drive Plug type backward curve fan section with VFD with stater Panel (VFD to be supplied by AHU manufacturer) by High Energy Efficient (IE3) motor and assembly. EU-7 filter section with filters, Heating Coil with 4 Coil, Provision Space for Stand By Coil for OT AHU . AHU Dampers to be of Extruded Aluminum Low Leakage Aerofoil Volume Control Dampers with extended shaft suitable for Manual & Motorised operation & Necessary cabling & earthing strip. Limit switches for AHU doors, inspection lamps with fire proof Double Canvass connection (Fungal and Lint free). Junction box with contactor strip to be provided on the outer panel with positive isolation for electrical shock for heater connection.Fan static pressure shall be minimum 50 mm or higher if required to overcome actual pressure drop. Cooling coil to be selected as per minimum 500 FPM and 4/6/8 Row or as required to achieve required coil leaving conditions. Limit Switch, Lamp, Fire Damper etc control wiring to be given at one location on AHU.For detailed constructional feature, please refer Technical Annexure.The vendor shall comply with EN 1886-2007 for Casing Air Leakage (L2), Filter Bypass Leakage, Mechanical strength, Thermal Transmittance & Thermal BridgingSpecification to be read following sequence- GTH-AHU capacity & St. pressure in mm of water colour.	1.00	Nos.	1,84,000.00	1,84,000.00

SR.NO	REF. CODE	DESCRIPTION	QTY	UNIT	S/I/T/C RATE	S/I/T/C TOTAL AMOUNT
17	BAH-HVAC-FA-47	SITC of Chilled Water Ceiling Suspended Air Handling unit 6.00 TR / 1800 CFM / CONSULTANT,ICTC /UTILITY / CSU / 65MM ST.PR. / 10µ & 20µ COMBINATION FILTER / 3µ FILTER SUITABLE VFD RATING WITH AUTO BYPASS STARTER PANEL WITH 30% HARMONIC FILTER with thermal break profile and internal coving, double skin panels minimum 43±2 mm thick fabricated out pre-plasticized 22 swg GSS on outer side and plain 22 swg Galvanized sheet on inner side with PUF insulation density not less than 40 kg/m3 sandwiched between inner and outer sheet with internal 15mm acoustic insulation. The AHU shall comprise of Fresh Air Module with EU-4 filter and volume control damper, Mixing Chamber, EU-3 & EU-4 filter section with filters, Chilled Water Coil Section with min. 4/6/8 Row Chilled water coil, Metallic Moisture Eliminator Removable , Sliding Type Arrangement with access door, and SS drain pan, complete with Direct drive Plug type backward curve fan section with VFD with stater Panel (VFD to be supplied by AHU manufacturer) by High Energy Efficient (IE3) motor and assembly. EU-7 filter section with filters, Heating Coil with 4 Coil, Provision Space for Stand By Coil for OT AHU . AHU Dampers to be of Extruded Aluminum Low Leakage Aerofoil Volume Control Dampers with extended shaft suitable for Manual & Motorised operation & Necessary cabling & earthing strip. Limit switches for AHU doors, inspection lamps with fire proof Double Canvass connection (Fungal and Lint free). Junction box with contactor strip to be provided on the outer panel with positive isolation for electrical shock for heater connection.Fan static pressure shall be minimum 50 mm or higher if required to overcome actual pressure drop. Cooling coil to be selected as per minimum 500 FPM and 4/6/8 Row or as required to achieve required coil leaving conditions. Limit Switch, Lamp, Fire Damper etc control wiring to be given at one location on AHU.For detailed constructional feature, please refer Technical Annexure.The vendor shall comply with EN 1886-2007 for Casing Air Leakage (L2), Filter Bypass Leakage, Mechanical strength, Thermal Transmittance & Thermal BridgingSpecification to be read following sequence- GTH-AHU capacity & St. pressure in mm of water coloum.	2.00	Nos.	2,07,000.00	4,14,000.00
18	BAH-HVAC-FA-33	SITC of Chilled Water Double Skin Floor Mounted 24.50 TR / 9000 CFM / PAEDI. SURGERY WARD / FMAHU / 65MM ST.PR. / 10µ & 20µ COMBINATION FILTER / 3µ FILTER / UVGI LAMP / SUITABLE VFD RATING WITH AUTO BYPASS STARTER PANEL WITH 30% HARMONIC FILTER with thermal break profile and internal coving, double skin panels minimum 43±2 mm thick fabricated out pre-plasticized 22 swg GSS on outer side and plain 22 swg Galvanized sheet on inner side with PUF insulation density not less than 40 kg/m3 sandwiched between inner and outer sheet. The AHU shall comprise of Fresh Air Module with EU-4 filter and volume control damper, Mixing Chamber, EU-3 & EU-4 filter section with filters, Chilled Water Coil Section with min. 4/6/8 Row Chilled water coil, Metallic Moisture Eliminator Removable , Sliding Type Arrangement with access door, and SS drain pan, complete with Direct drive Plug type backward curve fan section with VFD with stater Panel (VFD to be supplied by AHU manufacturer) by High Energy Efficient (IE3) motor and assembly. EU-7 filter section with filters, Heating Coil with 4 Coil, Provision Space for Stand By Coil for OT AHU, AHU Dampers to be of Extruded Aluminum Low Leakage Aerofoil Volume Control Dampers with extended shaft suitable for Manual & Motorised operation & Necessary cabling & earthing strip. Limit switches for AHU doors, inspection lamps with fire proof Double Canvass connection (Fungal and Lint free). Junction box with contactor strip to be provided on the outer panel with positive isolation for electrical shock for heater connection.Fan static pressure shall be minimum 50 mm or higher if required to overcome actual pressure drop. Cooling coil to be selected as per minimum 500 FPM and 4/6/8 Row or as required to achieve required coil leaving conditions. Limit Switch, Lamp, Fire Damper etc control wiring to be given at one location on AHU.For detailed constructional feature, please refer Technical Annexure.The vendor shall comply with EN 1886-2007 for Casing Air Leakage (L2), Filter Bypass Leakage, Mechanical strength, Thermal Transmittance & Thermal BridgingSpecification to be read following sequence- GTH-AHU capacity & St. pressure in mm of water coloum.	1.00	Nos.	12,60,000.00	12,60,000.00
		AIR HANDLING UNITS (FAIR Items)				

SR.NO	REF. CODE	DESCRIPTION	QTY	UNIT	S/I/T/C RATE	S/I/T/C TOTAL AMOUNT
		<p>Supply, installation, testing and commissioning of Sectionalised, Chilled Water Double Skin Air Handling Units with Thermal break profile & UVGI compatible constructed of extruded aluminum hollow sections framework, preplasticised GS Sheets of 22G (outside) / 22G (inside) with 40 mm thick injected PUF / 40 kg/cu.m + 5% density, consisting of fan section with Plug type Centrifugal Plenum Fan , & High Eff (IE-3) TEFC IP 55 motor , vibration isolators. Coil Section with 6R/4R/8R Coil, insulated sandwich type drain tray of SS (inside) / GI (outside). Internal surface shall be smooth and shall be cleanable without any projection.</p> <p>Fan outlet velocity not to exceed 1800 fpm. Coil face velocity not to exceed 500 fpm. AHU Coil shall be designed for 52 F ADP.The fan shall have low sound level exceeding not more than 40DBA at 3 metre distance. AHU's shall be with 4-Pole Motor & Accoustically Insulated with 25 mm Thick open cell Nitrile rubber. All AHU's are of UVGI Lights compatible.Fan & Motor - AHU's are to be equipped with High Efficiency Plug Fans motor, energy optimized for operation without spiral housing for high efficiency and favourable acoustic behaviour. Fan & Controller are of same Make & Controller shall be with BMS Compatible with panel. UVGI specs shall be followed as per detailed TDS.</p>				
		<p>The fan shall run in variable speed depend on the cooling load and humidity requirement, energy efficient, low noise and shall be complete with Frequency inverter, motor controller and Voltage controller. Direct-drive single-inlet centrifugal fans with backward-curved high-performance centrifugal impellers with rotation diffuser, mounted on external rotor motor with integrated control electronics. The fans shall be Modbus RTU compatible for communication with BMS (Building Management System). The fan in totality shall be of most efficient type so that the power consumption and noise level is minimal. The plug fan should take the input from various control devices like Thermostat, pressure sensors etc so as to Modulate the Fan speed from minimum to maximum. The minimum efficiency class of the motor shall be IE3. Motor shall be of 4/6 pole. AHU shall be provided with test ports with plugs to facilitate testing & measuring of air quality before & after coil & after fan section. All OTs Units shall have the Stanby Coil for emergency.</p>				
		<p>Filter - Each unit shall be provided with a factory assembled filter section containing Pre filter of MERV-10 & Fine filter of MERV-14 washable synthetic type air filters having GI frame. Filter media and frame shall be rust proof and corrosion resistant.The filter shall have minimum >95% efficiency with <1.0 microns & minimum >98% efficiency with <1.0 microns 0- as per ASHRAE-52.2-1999 Arrestance.Filter bypass rating shall ensure F6 & F9 standard of EN 1886 European standard. Eurovent certified computerized selection for AHU shall be with filter selection. Unit shall be floor/ceiling mounted as per requirement with sandwich type insulated SS drain tray, door limit switches, RA mixing box(wherever required), prefilter section with filters 95% down 10.0 micron & Fine filter 97% down 1.0 micron - 0-, coil section coil connected to CHW type distributor, fan section with backward curved fans. AHU shall have a UV light fitted across the coil section. AHU with mounted on floor shall have vibration isolators. Unit shall be with factory fitted inlet/outlet aluminium aerofoil dampers. Price shall include all accessories required for healthy working.FA opening shall have filter and insect screen. The cost shall include BMS Compatible Starter & Control panel of 2mm thick CRCA sheet with OLP, SPP, ON/OFF push buttons with ON indications, A-M switch for remote operation, A-M Switch for switching to bypass starting instead of VFD starting, 3nos. NO-NC (non polarized) contacts for tripping on signal from fire dampers / fire alarm panel, remote status feedback. The AHU Panel shall be provisioned to house the AHU VFD and a standalone Controller(Thermostat) & shall have a bypass to be included in cost.</p> <p>All the OTs & ICUs AHUs have the spacing fro the Heatpipe arrangements as a part of AHU assembly and the Contractor shall design the unit with the coordination of required supplier.</p>				
		<p>Arrangement for the AHU to run on normal starter incase of VFD failure. AHUs shall be controlled via VFD and Standalone Controller. The Canvas connection for AHU should be Fire Rated & Fungal and Lint free.</p> <p>Cabling: Power cabling of copper armoured cable from panel to motor with double compression gland & Copper armoured Control cabling with hookup to its controller</p>				

SR.NO	REF. CODE	DESCRIPTION	QTY	UNIT	S/I/T/C RATE	S/I/T/C TOTAL AMOUNT
		The unit will be certified by Eurovent/AHRI. AHU will be certified for mechanical performance like casing heat transfer coefficient class T3, Thermal bridging TB-2, mechanical strength D1 and casing tightness L1 according to EN 1886: 2007 standard. All AHU's are of UVGI Lights compatible. Note: All AHUs to operate with VFD, VFD package shall be supplied by AHU manufacturer. Bypass starter & Power/Control cabling from Starter to Motor shall be in HVAC Contractors Scope. Installation of AHU's shall mean Unloading, lifting-shifting, positioning, levelling & installation in place. All AHUs shall be delivered at site and Installed in place by skilled workmen of AHU supplier/Contractor. (NOTE : CONTRACTOR SHALL VERIFY STATIC PRESSURE FROM CONSTRUCTION DRAWINGS BEFORE ORDERING.)				
19	FAIR ITEM	2600 CFM at 135 mm static pressure. (6.5 T.R.) - For Ots Floor Mounted AHU with Heatpipe Provision & Mixing Box (rest description as above) (Minor & Septic OT)	2.00	Nos.	2,00,000.00	4,00,000.00
20	FAIR ITEM	2300 CFM at 55 mm static pressure. (7.0 T.R.) - Ceiling Suspended (X-ray-1&2)	2.00	Nos.	1,40,000.00	2,80,000.00
21	FAIR ITEM	2000 CFM at 75 mm static pressure. (5.0 T.R.) - Floor Mounted AHU with Mixing Box (rest description as above) (Obstetrics)	1.00	Nos.	1,70,000.00	1,70,000.00
22	FAIR ITEM	7200 CFM at 75 mm static pressure. (18.0 T.R.) - Floor Mounted AHU with Mixing Box (rest description as above) (DeliveryRoom)	1.00	Nos.	4,20,000.00	4,20,000.00
23	FAIR ITEM	4800 CFM at 75 mm static pressure. (12.0 T.R.) - Floor Mounted AHU with Mixing Box (rest description as above) (Pre OP)	1.00	Nos.	3,20,000.00	3,20,000.00
24	FAIR ITEM	2000 CFM at 55 mm static pressure. (5.0 T.R.) - Ceiling Suspended (OT Corridor)	2.00	Nos.	1,20,000.00	2,40,000.00
25	FAIR ITEM	3000 CFM at 135 mm static pressure. (8.0 T.R.) - For Ots Floor Mounted AHU with Heatpipe Provision & Mixing Box (rest description as above) (OT-1TO8)	8.00	Nos.	2,40,000.00	19,20,000.00
26	FAIR ITEM	2600 CFM at 135 mm static pressure. (7.0 T.R.) - For Ots Floor Mounted AHU with Heatpipe Provision & Mixing Box (rest description as above) (OT CORRODOR)	1.00	Nos.	2,10,000.00	2,10,000.00
27	FAIR ITEM	7600 CFM at 95 mm static pressure. (19.0 T.R.) - For Post-OP Floor Mounted AHU with Heatpipe Provision & Mixing Box (rest description as above) (Post OP)	1.00	Nos.	4,60,000.00	4,60,000.00
28	FAIR ITEM	4000 CFM at 95 mm static pressure. (10.0 T.R.) - For NICU-Internal Floor Mounted AHU with Heatpipe Provision & Mixing Box (rest description as above)	1.00	Nos.	3,80,000.00	3,80,000.00
29	FAIR ITEM	2200 CFM at 95 mm static pressure. (6.0 T.R.) - For NICU-External Floor Mounted AHU with Heatpipe Provision & Mixing Box (rest description as above)	1.00	Nos.	2,10,000.00	2,10,000.00
30	FAIR ITEM	9000 CFM at 95 mm static pressure. (23.0 T.R.) - For MICU-1&2 Floor Mounted AHU with Heatpipe Provision & Mixing Box (rest description as above)	1.00	Nos.	6,50,000.00	6,50,000.00
31	FAIR ITEM	5900 CFM at 95 mm static pressure. (18.8 T.R.) - For MICU-1&2 Floor Mounted AHU with Heatpipe Provision & Mixing Box (rest description as above)	2.00	Nos.	4,10,000.00	8,20,000.00
32	FAIR ITEM	1200 CFM at 40 mm static pressure. (3.5 T.R.) - Ceiling Suspended	3.00	Nos.	1,00,000.00	3,00,000.00
33	R2-ME-9-16-a	SITC of Chilled Water Fan Coil Unit 1.00TR / 400 CFM complete with copper tube aluminum finned coil 3 row deep chilled water coil, shall be with factory fitted with complete valve station consists of copper piping and manifolds & drain pan, 2 way ON/OFF Control chilled water valve along with actuator, brass made Y strainer type ball valve, brass ball valve. All valves shall be of PN-16 pressure rating. Quoted rates shall be inclusive of the cost of valve's thermal insulations as specified for chilled water piping insulation Pre- filters, high efficiency centrifugal fan easily cleanable synthetic filter, DIGITAL THERMOSTAT with necessary power and control wiring with PVC conduit etc. for the operation of a 3 speed fan & Temperature control. other accessories etc. 3C x 1.5 Sq.mm. Power cable of 3 mtr. length with 3 pin plug top from unit motor to the nearest power socket shall be included in the scope of supply. 2 way ON/OFF Control chilled water valve will be of PN16 rating complete with motor 220/230 volt of actuator of suitable torque. The valve should be IEC 534 compliant, have 20 mm stroke. All necessary supporting hanger, MS structure for supporting units, anchor fasteners, nut, bolts etc. to be included in the scope. All Cassette units shall be suitable for 220±6% volts, 50 cycles single phase power supply	1.00	Nos.	25,092.00	25,092.00

SR.NO	REF. CODE	DESCRIPTION	QTY	UNIT	S/I/T/C RATE	S/I/T/C TOTAL AMOUNT
34	R2-ME-9-16-b	SITC of Chilled Water Fan Coil Unit 1.5TR / 600 CFM complete with copper tube aluminum finned coil 3 row deep chilled water coil, shall be with factory fitted with complete valve station consists of copper piping and manifolds & drain pan, 2 way ON/OFF Control chilled water valve along with acuator , brass made Y strainer type ball valve, brass ball valve.All valves shall be of PN-16 pressure rating Quoted rates shall be inclusive of the cost of valve's thermal insulations as specified for chilled water piping insulation Pre- filters, high efficiency centrifugal fan easily cleanable synthetic filter,DIGITAL THERMOSTAT with necessary power and control wiring with PVC conduit etc. for the operation of a 3 speed fan & Temperature control. other accessories etc. 3C x 1.5 Sq.mm.Power cable of 3 mtr.length with 3 pin plug top from unit motor to the nearest power socket shall be included in the scope of supply. 2 way ON/OFF Control chilled water valve will be of PN16 rating complete with motor 220/230 volt of actuator of suitable torque.The valve should be IEC 534 compliant , have 20 mm stroke.All necessary supporting hanger, MS structure for supporting units, anchor fastners, nut , bolts etc. to be included in the scope .All Cassette units shall be suitable for 220±6% volts, 50 cycles single phase power supply	8.00	Nos.	26,415.00	2,11,320.00
35	R2-ME-9-16-c	SITC of Chilled Water Fan Coil Unit 2.00TR / 800 CFM complete with copper tube aluminum finned coil 3 row deep chilled water coil, shall be with factory fitted with complete valve station consists of copper piping and manifolds & drain pan, 2 way ON/OFF Control chilled water valve along with acuator , brass made Y strainer type ball valve, brass ball valve.All valves shall be of PN-16 pressure rating Quoted rates shall be inclusive of the cost of valve's thermal insulations as specified for chilled water piping insulation Pre- filters, high efficiency centrifugal fan easily cleanable synthetic filter,DIGITAL THERMOSTAT with necessary power and control wiring with PVC conduit etc. for the operation of a 3 speed fan & Temperature control. other accessories etc. 3C x 1.5 Sq.mm.Power cable of 3 mtr.length with 3 pin plug top from unit motor to the nearest power socket shall be included in the scope of supply. 2 way ON/OFF Control chilled water valve will be of PN16 rating complete with motor 220/230 volt of actuator of suitable torque.The valve should be IEC 534 compliant , have 20 mm stroke.All necessary supporting hanger, MS structure for supporting units, anchor fastners, nut , bolts etc. to be included in the scope .All Cassette units shall be suitable for 220±6% volts, 50 cycles single phase power supply	3.00	Nos.	40,513.00	1,21,539.00
36	R2-ME-9-16-d	SITC of Chilled Water Fan Coil Unit 2.5TR / 1000 CFM complete with copper tube aluminum finned coil 3 row deep chilled water coil, shall be with factory fitted with complete valve station consists of copper piping and manifolds & drain pan, 2 way ON/OFF Control chilled water valve along with acuator , brass made Y strainer type ball valve, brass ball valve.All valves shall be of PN-16 pressure rating Quoted rates shall be inclusive of the cost of valve's thermal insulations as specified for chilled water piping insulation Pre- filters, high efficiency centrifugal fan easily cleanable synthetic filter,DIGITAL THERMOSTAT with necessary power and control wiring with PVC conduit etc. for the operation of a 3 speed fan & Temperature control. other accessories etc. 3C x 1.5 Sq.mm.Power cable of 3 mtr.length with 3 pin plug top from unit motor to the nearest power socket shall be included in the scope of supply. 2 way ON/OFF Control chilled water valve will be of PN16 rating complete with motor 220/230 volt of actuator of suitable torque.The valve should be IEC 534 compliant , have 20 mm stroke.All necessary supporting hanger, MS structure for supporting units, anchor fastners, nut , bolts etc. to be included in the scope .All Cassette units shall be suitable for 220±6% volts, 50 cycles single phase power supply	1.00	Nos.	50,237.00	50,237.00
37	R2-ME-9-16-e	SITC of Chilled Water Fan Coil Unit 3.00TR / 1200 CFM complete with copper tube aluminum finned coil 3 row deep chilled water coil, shall be with factory fitted with complete valve station consists of copper piping and manifolds & drain pan, 2 way ON/OFF Control chilled water valve along with acuator , brass made Y strainer type ball valve, brass ball valve.All valves shall be of PN-16 pressure rating Quoted rates shall be inclusive of the cost of valve's thermal insulations as specified for chilled water piping insulation Pre- filters, high efficiency centrifugal fan easily cleanable synthetic filter,DIGITAL THERMOSTAT with necessary power and control wiring with PVC conduit etc. for the operation of a 3 speed fan & Temperature control. other accessories etc. 3C x 1.5 Sq.mm.Power cable of 3 mtr.length with 3 pin plug top from unit motor to the nearest power socket shall be included in the scope of supply. 2 way ON/OFF Control chilled water valve will be of PN16 rating complete with motor 220/230 volt of actuator of suitable torque.The valve should be IEC 534 compliant , have 20 mm stroke.All necessary supporting hanger, MS structure for supporting units, anchor fastners, nut , bolts etc. to be included in the scope .All Cassette units shall be suitable for 220±6% volts, 50 cycles single phase power supply	34.00	Nos.	59,150.00	20,11,100.00

SR.NO	REF. CODE	DESCRIPTION	QTY	UNIT	S/I/T/C RATE	S/I/T/C TOTAL AMOUNT
38	BAH-HVAC-FA-55	SITC of Chilled Water Four Way Cassette Units 4.00TR / 1600 CFM complete with copper tube aluminum finned coil 2/3 row deep chilled water coil, shall be with factory fitted with complete valve station consists of copper piping and manifolds & drain pan, 2 way ON/OFF Control chilled water valve along with actuator , brass made Y strainer type ball valve, brass ball valve.All valves shall be of PN-16 pressure rating Quoted rates shall be inclusive of the cost of valve's thermal insulations as specified for chilled water piping insulation Pre filters, high efficiency centrifugal fan easily cleanable synthetic filter,DIGITAL THERMOSTAT with necessary power and control wiring with PVC conduit etc. for the operation of a 3 speed fan & Temperature control. other accessories etc. 3C x 1.5 Sq.mm.Power cable of 3 mtr.length with 3 pin plug top from unit motor to the nearest power socket shall be included in the scope of supply. 2 way ON/OFF Control chilled water valve will be of PN16 rating complete with motor 220/230 volt of actuator of suitable torque.The valve should be IEC 534 compliant , have 20 mm stroke.All necessary supporting hanger, MS structure for supporting units, anchor fastners, nut , bolts etc. to be included in the scope .All Cassette units shall be suitable for 220±6% volts, 50 cycles single phase power supply.	1.00	Nos.	85,000.00	85,000.00
39	BAH-HVAC-FA-56	SITC of Chilled Water Four Way Cassette Units 3.00 TR / 1200 CFM complete with copper tube aluminum finned coil 2/3 row deep chilled water coil, shall be with factory fitted with complete valve station consists of copper piping and manifolds & drain pan, 2 way ON/OFF Control chilled water valve along with actuator , brass made Y strainer type ball valve, brass ball valve.All valves shall be of PN-16 pressure rating Quoted rates shall be inclusive of the cost of valve's thermal insulations as specified for chilled water piping insulation Pre filters, high efficiency centrifugal fan easily cleanable synthetic filter,DIGITAL THERMOSTAT with necessary power and control wiring with PVC conduit etc. for the operation of a 3 speed fan & Temperature control. other accessories etc. 3C x 1.5 Sq.mm.Power cable of 3 mtr.length with 3 pin plug top from unit motor to the nearest power socket shall be included in the scope of supply. 2 way ON/OFF Control chilled water valve will be of PN16 rating complete with motor 220/230 volt of actuator of suitable torque.The valve should be IEC 534 compliant , have 20 mm stroke.All necessary supporting hanger, MS structure for supporting units, anchor fastners, nut , bolts etc. to be included in the scope .All Cassette units shall be suitable for 220±6% volts, 50 cycles single phase power supply.	1.00	Nos.	75,000.00	75,000.00
40	BAH-HVAC-FA-57	SITC of Chilled Water Four Way Cassette Units 2.50 TR / 1000 CFM complete with copper tube aluminum finned coil 2/3 row deep chilled water coil, shall be with factory fitted with complete valve station consists of copper piping and manifolds & drain pan, 2 way ON/OFF Control chilled water valve along with actuator , brass made Y strainer type ball valve, brass ball valve.All valves shall be of PN-16 pressure rating Quoted rates shall be inclusive of the cost of valve's thermal insulations as specified for chilled water piping insulation Pre filters, high efficiency centrifugal fan easily cleanable synthetic filter,DIGITAL THERMOSTAT with necessary power and control wiring with PVC conduit etc. for the operation of a 3 speed fan & Temperature control. other accessories etc. 3C x 1.5 Sq.mm.Power cable of 3 mtr.length with 3 pin plug top from unit motor to the nearest power socket shall be included in the scope of supply. 2 way ON/OFF Control chilled water valve will be of PN16 rating complete with motor 220/230 volt of actuator of suitable torque.The valve should be IEC 534 compliant , have 20 mm stroke.All necessary supporting hanger, MS structure for supporting units, anchor fastners, nut , bolts etc. to be included in the scope .All Cassette units shall be suitable for 220±6% volts, 50 cycles single phase power supply.	1.00	Nos.	60,000.00	60,000.00
41	BAH-HVAC-FA-58	SITC of Chilled Water Four Way Cassette Units 2.00 TR / 800 CFM complete with copper tube aluminum finned coil 2/3 row deep chilled water coil, shall be with factory fitted with complete valve station consists of copper piping and manifolds & drain pan, 2 way ON/OFF Control chilled water valve along with actuator , brass made Y strainer type ball valve, brass ball valve.All valves shall be of PN-16 pressure rating Quoted rates shall be inclusive of the cost of valve's thermal insulations as specified for chilled water piping insulation Pre filters, high efficiency centrifugal fan easily cleanable synthetic filter,DIGITAL THERMOSTAT with necessary power and control wiring with PVC conduit etc. for the operation of a 3 speed fan & Temperature control. other accessories etc. 3C x 1.5 Sq.mm.Power cable of 3 mtr.length with 3 pin plug top from unit motor to the nearest power socket shall be included in the scope of supply. 2 way ON/OFF Control chilled water valve will be of PN16 rating complete with motor 220/230 volt of actuator of suitable torque.The valve should be IEC 534 compliant , have 20 mm stroke.All necessary supporting hanger, MS structure for supporting units, anchor fastners, nut , bolts etc. to be included in the scope .All Cassette units shall be suitable for 220±6% volts, 50 cycles single phase power supply.	8.00	Nos.	50,000.00	4,00,000.00

SR.NO	REF. CODE	DESCRIPTION	QTY	UNIT	S/I/T/C RATE	S/I/T/C TOTAL AMOUNT
42	BAH-HVAC-FA-59	SITC of Chilled Water Four Way Cassette Units 1.50 TR / 600 CFM complete with copper tube aluminum finned coil 2/3 row deep chilled water coil, shall be with factory fitted with complete valve station consists of copper piping and manifolds & drain pan, 2 way ON/OFF Control chilled water valve along with actuator , brass made Y strainer type ball valve, brass ball valve.All valves shall be of PN-16 pressure rating Quoted rates shall be inclusive of the cost of valve's thermal insulations as specified for chilled water piping insulation Pre filters, high efficiency centrifugal fan easily cleanable synthetic filter,DIGITAL THERMOSTAT with necessary power and control wiring with PVC conduit etc. for the operation of a 3 speed fan & Temperature control. other accessories etc. 3C x 1.5 Sq.mm.Power cable of 3 mtr.length with 3 pin plug top from unit motor to the nearest power socket shall be included in the scope of supply. 2 way ON/OFF Control chilled water valve will be of PN16 rating complete with motor 220/230 volt of actuator of suitable torque.The valve should be IEC 534 compliant , have 20 mm stroke.All necessary supporting hanger, MS structure for supporting units, anchor fastners, nut , bolts etc. to be included in the scope .All Cassette units shall be suitable for 220±6% volts, 50 cycles single phase power supply.	7.00	Nos.	40,000.00	2,80,000.00
43	BAH-HVAC-FA-60	SITC of Chilled Water Four Way Cassette Units 1.00 TR / 400 CFM complete with copper tube aluminum finned coil 2/3 row deep chilled water coil, shall be with factory fitted with complete valve station consists of copper piping and manifolds & drain pan, 2 way ON/OFF Control chilled water valve along with actuator , brass made Y strainer type ball valve, brass ball valve.All valves shall be of PN-16 pressure rating Quoted rates shall be inclusive of the cost of valve's thermal insulations as specified for chilled water piping insulation Pre filters, high efficiency centrifugal fan easily cleanable synthetic filter,DIGITAL THERMOSTAT with necessary power and control wiring with PVC conduit etc. for the operation of a 3 speed fan & Temperature control. other accessories etc. 3C x 1.5 Sq.mm.Power cable of 3 mtr.length with 3 pin plug top from unit motor to the nearest power socket shall be included in the scope of supply. 2 way ON/OFF Control chilled water valve will be of PN16 rating complete with motor 220/230 volt of actuator of suitable torque.The valve should be IEC 534 compliant , have 20 mm stroke.All necessary supporting hanger, MS structure for supporting units, anchor fastners, nut , bolts etc. to be included in the scope .All Cassette units shall be suitable for 220±6% volts, 50 cycles single phase power supply.	18.00	Nos.	35,000.00	6,30,000.00
44	BAH-HVAC-FA-61	SITC of Chilled Water Four Way Compact Cassette Units 1.00 TR / 400 CFM complete with copper tube aluminum finned coil 2/3 row deep chilled water coil, shall be with factory fitted with complete valve station consists of copper piping and manifolds & drain pan, 2 way ON/OFF Control chilled water valve along with actuator , brass made Y strainer type ball valve, brass ball valve.All valves shall be of PN-16 pressure rating Quoted rates shall be inclusive of the cost of valve's thermal insulations as specified for chilled water piping insulation Pre- filters, high efficiency centrifugal fan easily cleanable synthetic filter,DIGITAL THERMOSTAT with necessary power and control wiring with PVC conduit etc. for the operation of a 3 speed fan & Temperature control. other accessories etc. 3C x 1.5 Sq.mm.Power cable of 3 mtr.length with 3 pin plug top from unit motor to the nearest power socket shall be included in the scope of supply. 2 way ON/OFF Control chilled water valve will be of PN16 rating complete with motor 220/230 volt of actuator of suitable torque.The valve should be IEC 534 compliant , have 20 mm stroke.All necessary supporting hanger, MS structure for supporting units, anchor fastners, nut , bolts etc. to be included in the scope .All Cassette units shall be suitable for 220±6% volts, 50 cycles single phase	23.00	Nos.	55,000.00	12,65,000.00
45	BAH-HVAC-FA-62	SITC of Chilled Water Hi-Wall Units 2.00 TR with factory fitted inbuilt 2 Way chilled water valve along with actuator, complete with copper tube aluminum finned coil 2/3 row deep chilled water coil, shall be with factory fitted with complete valve station consists of copper piping and manifolds & drain pan with drain pump, 2 way ON/OFF Control chilled water valve along with actuator , brass made Y strainer type ball valve, brass ball valve. All valves shall be of PN-16 pressure rating Quoted rates shall be inclusive of the cost of valve's thermal insulations as specified for chilled water piping insulation Pre- filters, high efficiency centrifugal fan easily cleanable synthetic filter,cordless remote for the operation of a 3 speed fan & Temperature control. other accessories etc. 3C x 1.5 Sq.mm.Power cable of 3 mtr.length with 3 pin plug top from unit motor to the nearest power socket shall be included in the scope of supply. 2 way Control chilled water valve will be of PN16 rating complete with motor 220/230 volt of actuator of suitable torque.The valve should be IEC 534 compliant , have 20 mm stroke.All necessary supporting hanger, MS structure for supporting units, anchor fastners, nut , bolts etc. to be included in the scope .All Hi-Wall units shall be suitable for 220±6% volts, 50 cycles single phase power supply.	9.00	Nos.	85,000.00	7,65,000.00

SR.NO	REF. CODE	DESCRIPTION	QTY	UNIT	S/I/T/C RATE	S/I/T/C TOTAL AMOUNT
46	BAH-HVAC-FA-63	SITC of Chilled Water Hi-Wall Units 1.50 TR with factory fitted inbuilt 2 Way chilled water valve along with acuator, complete with copper tube aluminum finned coil 2/3 row deep chilled water coil,shall be with factory fitted with complete valve station consists of copper piping and maniflods & drain pan with drain pump, 2 way ON/OFF Control chilled water valve along with acuator , brass made Y strainer type ball valve, brass ball valve. All valves shall be of PN-16 pressure rating Quoted rates shall be inclusive of the cost of valve's thermal insulations as specified for chilled water piping insulation Pre- filters, high efficiency centrifugal fan easily cleanable synthetic filter, cordless remote for the operation of a 3 speed fan & Temperature control. other accessories etc. 3C x 1.5 Sq.mm.Power cable of 3 mtr.length with 3 pin plug top from unit motor to the nearest power socket shall be included in the scope of supply. 2 way Control chilled water valve will be of PN16 rating complete with motor 220/230 volt of actuator of suitable torque.The valve should be IEC 534 compliant , have 20 mm stroke.All necessary supporting hanger, MS structure for supporting units, anchor fastners, nut , bolts etc. to be included in the scope .All Hi-Wall units shall be suitable for 220±6% volts, 50 cycles single phase power supply.	9.00	Nos.	70,000.00	6,30,000.00
47	BAH-HVAC-FA-64	SITC of Chilled Water Hi-Wall Units 1.00 TR with factory fitted inbuilt 2 Way chilled water valve along with acuator, complete with copper tube aluminum finned coil 2/3 row deep chilled water coil,shall be with factory fitted with complete valve station consists of copper piping and maniflods & drain pan with drain pump, 2 way ON/OFF Control chilled water valve along with acuator , brass made Y strainer type ball valve, brass ball valve. All valves shall be of PN-16 pressure rating Quoted rates shall be inclusive of the cost of valve's thermal insulations as specified for chilled water piping insulation Pre- filters, high efficiency centrifugal fan easily cleanable synthetic filter, cordless remote for the operation of a 3 speed fan & Temperature control. other accessories etc. 3C x 1.5 Sq.mm.Power cable of 3 mtr.length with 3 pin plug top from unit motor to the nearest power socket shall be included in the scope of supply. 2 way Control chilled water valve will be of PN16 rating complete with motor 220/230 volt of actuator of suitable torque.The valve should be IEC 534 compliant , have 20 mm stroke.All necessary supporting hanger, MS structure for supporting units, anchor fastners, nut , bolts etc. to be included in the scope .All Hi-Wall units shall be suitable for 220±6% volts, 50 cycles single phase power supply.	9.00	Nos.	55,000.00	4,95,000.00
48	BAH-HVAC-FA-65	SITC of 15.70 TR / 9,250 CFM / 65 MM ST.PR. (1 WORKING+1STD BY) of Dual fluid micro-processor controlled Precision Air-conditioning Unit with scroll compressor(s) on HFC-410a / HFC-407c air cooled condenser with installation stand, insulated refrigerant piping with supports, DX cooling coil, Chilled water cooling coil, electrical heating coil, steam humidifier, necessary measuring and control devices, variable speed evaporator fan with motor, pre and micro-vee filters and inbuilt starter. Power will be provided by other agency near the indoor unit inbuilt starter. Power and control cabling from indoor to outdoor unit along with supports / cable trays and its stater Panel shall be included and it should compatable with BMS. Capacity indicated below shall be minimum from DX or Chilled water mode. Indoor unit shall have dual incomer provision to receive sourace dual electrical feeders. Chilled water cooling coil shall be designed for inlet water temperature of 41 Deg.F and return temperature of 55.4 Deg.F.	2.00	Nos.	7,86,250.00	15,72,500.00
49	FAIR ITEM	SITC of 7.6 TR / 5,150 CFM / 65 MM ST.PR. (1 WORKING+1STD BY) of Dual fluid micro-processor controlled Precision Air-conditioning Unit with scroll compressor(s) on HFC-410a / HFC-407c air cooled condenser with installation stand, insulated refrigerant piping with supports, DX cooling coil, Chilled water cooling coil, electrical heating coil, steam humidifier, necessary measuring and control devices, variable speed evaporator fan with motor, pre and micro-vee filters and inbuilt starter. Power will be provided by other agency near the indoor unit inbuilt starter. Power and control cabling from indoor to outdoor unit along with supports / cable trays and its stater Panel shall be included and it should compatable with BMS. Capacity indicated below shall be minimum from DX or Chilled water mode. Indoor unit shall have dual incomer provision to receive sourace dual electrical feeders. Chilled water cooling coil shall be designed for inlet water temperature of 41 Deg.F and return temperature of 55.4 Deg.F.	2.00	Nos.	5,23,443.00	10,46,886.00
50	R2-ME-9-2-b	Supply / Installation / Testing / commissioning Of Air Cooled Hi-Wall Split UnitsSupplying and erecting split type room irconditioning unit 1.5 TR 5 star capacity 250V, 50 cycles, A.C. supply having 1 No of air handling unit hiwall / floor mounting type complete with Refrigerent R410 A/R32 and COPPER CONDENSOR with drain pump at position as per specification no. AP-AC/SAC	6.00	Nos.	56,486.00	3,38,916.00
51	BAH-HVAC-FA-66	SITC of Water Leak detector below flooring.	4.00	Nos.	15,000.00	60,000.00
52	R2-ME-9-32	SITC of Alluminium Supply Air Grille With Damper (600mmx600mm)	6.00	Sqm	17,551.00	1,05,306.00
53	KSS-HVAC-206	SITC of Alluminium Return Air Grille (600mmx600mm)	6.00	Sqm	6,813.00	40,878.00
		PIPING SECTION				
		CONDENSER PIPING SECTION				

SR.NO	REF. CODE	DESCRIPTION	QTY	UNIT	S/I/T/C RATE	S/I/T/C TOTAL AMOUNT
54	R2 AC-LTMGNOPD-F56	SITC of 250 mm dia of Condenser Water Piping With FRP (Fibre reinforced Polymer) Coating MS "C" Class Pipe Complete With All Accessories Such As Bends, Elbow, Flanges, Nut Bolts, Air Purging Valves, De-scaling Tee With MS Angle & Rod Supporting Work etc. Note:-The Pipes size 150mm & below shall be M.S. 'C' class as per IS : 1239 and pipes size above 150mm shall be welded black steel pipe heavy class as per IS: 3589, from minimum 6.35mm 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.	200.00	Mtr	7,031.00	14,06,200.00
55	KSS-HVAC-185	SITC of 200 mm dia of Condenser Water Piping With FRP (Fibre reinforced Polymer) Coating MS "C" Class Pipe Complete With All Accessories Such As Bends, Elbow, Flanges, Nut Bolts, Air Purging Valves, De-scaling Tee With MS Angle & Rod Supporting Work etc. Note:-The Pipes size 150mm & below shall be M.S. 'C' class as per IS : 1239 and pipes size above 150mm shall be welded black steel pipe heavy class as per IS: 3589, from minimum 6.35mm 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.	60.00	Mtr	3,534.00	2,12,040.00
56	BAH-HVAC-FA-67	SITC of 80mm dia. of Condenser Water Piping With FRP (Fibre reinforced Polymer) Coating MS "C" Class Pipe Complete With All Accessories Such As Bends, Elbow, Flanges, Nut Bolts, Air Purging Valves, De-scaling Tee With MS Angle & Rod Supporting Work etc. Note:-The Pipes size 150mm & below shall be M.S. 'C' class as per IS : 1239 and pipes size above 150mm shall be welded black steel pipe heavy class as per IS: 3589, from minimum 6.35mm 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.	50.00	Mtr	1,895.00	94,750.00
57	R2-ME-9-58-g	SITC of 65mm dia. of Condenser Water Piping With FRP (Fibre reinforced Polymer) Coating MS "C" Class Pipe Complete With All Accessories Such As Bends, Elbow, Flanges, Nut Bolts, Air Purging Valves, De-scaling Tee With MS Angle & Rod Supporting Work etc. Note:-The Pipes size 150mm & below shall be M.S. 'C' class as per IS : 1239 and pipes size above 150mm shall be welded black steel pipe heavy class as per IS: 3589, from minimum 6.35mm 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.	50.00	Mtr	2,033.00	1,01,650.00
		Condenser Valves & Fittings				
58	RBH-FA-AC-11	SITC of 250mm dia.Various Diameter of Butterfly Valves (SP-ME-TS-116) With FRP Insulation.	8.00	Nos.	12,400.00	99,200.00
59	R2-ME-9-59-a	SITC of 200mm dia.Various Diameter of Butterfly Valves (SP-ME-TS-116) With FRP Insulation.	16.00	Nos.	17,028.00	2,72,448.00
60	RBH-FA-AC-12	SITC of 200mm dia.Various Diameter of Non Return Valve (SP-ME-TS-117) With FRP Insulation.As per API-594	3.00	Nos.	18,200.00	54,600.00
61	RBH-FA-AC-13	SITC of 250mm dia. of Various Diameter of Balancing Valve	3.00	Nos.	1,16,300.00	3,48,900.00
62	R2-ME-9-62-a	SITC of 200mm dia.of Various Diameter of 'Y' Strainer With FRP Insulation.	3.00	Nos.	48,759.00	1,46,277.00
63	MTA-AC-109	POT STRAINER - 300 MM Ø	1.00	Nos.	1,07,137.00	1,07,137.00
64	RBH-FA-AC-16	SITC of 250mm dia. Motorized Butterfly Valves With Controller With FRP Insulation.	3.00	Nos.	1,13,090.00	3,39,270.00
65	RSG-18-FA-AC-9	SITC of 200mm dia. Motorized Butterfly Valves With Controller With FRP Insulation.	6.00	Nos.	1,20,626.40	7,23,758.40
66	RSG-18-FA-AC-129	SITC of of of Brass body Auto air vents FOR CHILLED WATER PIPES of 15 mm dia fitted with Forged Brass Chromium plated body ball valve thermal insulations.	30.00	Nos.	1,931.00	57,930.00
67	MTA-AC-81	Supply / Installation / Testing / commissioning of Ball Cock for Drain With Insulation As Per Specification.25 MM DIA	80.00	Nos.	956.00	76,480.00
68	MTA-AC-33	Supply / Installation / Testing / commissioning of Ball Cock With Insulation As Per Specification 32 MM DIA	30.00	Nos.	956.00	28,680.00
69	MTA-AC-35	Supply, Installation, Testing & commissioning of Dial Type Pressure Gauge of approved Make & Range 0-10 Kg/cm2 & Dial Size 100mm withInsulation.	14.00	Nos.	2,163.00	30,282.00
70	MTA-AC-36	SITC of of Temp Gauge with thermowell of approved Make & Range 0-50 Deg C , Dial Size 100 mm.The Temp. Guage to be of Industrial type and all Internal working Parts in SS 304 Quality. Sensor Probe Length - apx. 200mm.As per technical specification mention in tender.SITC of Temperature Gauge with thermowell of approved Make & Range 0-50Deg C, Dial Size 100 mm with Insulation. The Temp. Guage to be ofIndustrial type and all Internal working Parts in SS 304 Quality. Sensor Probe Length - approx. 200mm.	6.00	Nos.	2,600.00	15,600.00
		Chilled Water Piping & Valves				

SR.NO	REF. CODE	DESCRIPTION	QTY	UNIT	S/I/T/C RATE	S/I/T/C TOTAL AMOUNT
71	BAH-HVAC-FA-170	250mm dia.(44 mm thick insulation) M.S. 'C' class Varoius Diameter of piping confirming to IS: 1239/3569 heavy class Chilled water piping including all necessary fitting like anchor fasteners, pipe supporting frame structure, couplings, seamless bends, elbows, Tees, union, reducers, expander ASA 150 ISRF flanges, CAF gaskets, nuts & bolts etc. All indoor piping & valves insulated 45 Kg / cu m density, thermal conductivity 0.037 W/MK or better at 20 deg mean temperature class 'O' Nitrile Rubber finished with factory fabricated black Glass cloth as per specifications. All expose piping & valves insulated with Nitrile Rubber finished with factory fabricated black Glass cloth as per specifications & 26 guage alluminum cladding as per specifications Note - The Pipes of sizes 150mm & below shall be M.S. 'C' class as per IS : 1239 and pipes size above 150mm shall be welded black steel pipe heavy class as per IS: 3589, from minimum 6.35mm 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.	30.00	Mtr	5,388.00	1,61,640.00
72	R2-ME-9-50-L	Supply Installation of MS 'C' class chilled water pipe line / drain linealong with accessories and thermal insulation of nitrile rubber withglass cloth 200 MM Dia. (38 mm thick insulation) M.S. 'C' class Varoius Diameter of piping confirming to IS: 1239/3569 heavy class Chilled water piping including all necessary fitting like anchor fasteners, pipe supporting frame structure, couplings, seamless bends, elbows, Tees, union, reducers, expander ASA 150 ISRF flanges, CAF gaskets, nuts & bolts etc. All indoor piping & valves insulated 45 Kg / cu m density, thermal conductivity 0.037 W/MK or better at 20 deg mean temperature class 'O' Nitrile Rubber finished with factory fabricated black Glass cloth as per specifications. All expose piping & valves insulated with Nitrile Rubber finished with factory fabricated black Glass cloth as per specifications & 26 guage alluminum cladding as per specifications)	200.00	Mtr	7,276.00	14,55,200.00
73	R2-ME-9-50-m	Supply Installation of MS 'C' class chilled water pipe line / drain linealong with accessories and thermal insulation of nitrile rubber withglass cloth 150 MM Dia. (38 mm thick insulation) M.S. 'C' class Varoius Diameter of piping confirming to IS: 1239/3569 heavy class Chilled water piping including all necessary fitting like anchor fasteners, pipe supporting frame structure, couplings, seamless bends, elbows, Tees, union, reducers, expander ASA 150 ISRF flanges, CAF gaskets, nuts & bolts etc. All indoor piping & valves insulated 45 Kg / cu m density, thermal conductivity 0.037 W/MK or better at 20 deg mean temperature class 'O' Nitrile Rubber finished with factory fabricated black Glass cloth as per specifications. All expose piping & valves insulated with Nitrile Rubber finished with factory fabricated black Glass cloth as per specifications & 26 guage alluminum cladding as per specifications)	450.00	Mtr	5,950.00	26,77,500.00
74	R2-ME-9-50-n	Supply Installation of MS 'C' class chilled water pipe line / drain linealong with accessories and thermal insulation of nitrile rubber withglass cloth 125 MM Dia. (38 mm thick insulation) M.S. 'C' class Varoius Diameter of piping confirming to IS: 1239/3569 heavy class Chilled water piping including all necessary fitting like anchor fasteners, pipe supporting frame structure, couplings, seamless bends, elbows, Tees, union, reducers, expander ASA 150 ISRF flanges, CAF gaskets, nuts & bolts etc. All indoor piping & valves insulated 45 Kg / cu m density, thermal conductivity 0.037 W/MK or better at 20 deg mean temperature class 'O' Nitrile Rubber finished with factory fabricated black Glass cloth as per specifications. All expose piping & valves insulated with Nitrile Rubber finished with factory fabricated black Glass cloth as per specifications & 26 guage alluminum cladding as per specifications)	300.00	Mtr	4,864.00	14,59,200.00

SR.NO	REF. CODE	DESCRIPTION	QTY	UNIT	S/I/T/C RATE	S/I/T/C TOTAL AMOUNT
75	R2-ME-9-50-o	Supply Installation of MS 'C' class chilled water pipe line / drain line along with accessories and thermal insulation of nitrile rubber with glass cloth 100 MM Dia. (38 mm thick insulation) M.S. 'C' class Various Diameter of piping confirming to IS: 1239/3569 heavy class Chilled water piping including all necessary fitting like anchor fasteners, pipe supporting frame structure, couplings, seamless bends, elbows, Tees, union, reducers, expander ASA 150 ISRF flanges, CAF gaskets, nuts & bolts etc. All indoor piping & valves insulated 45 Kg / cu m density, thermal conductivity 0.037 W/MK or better at 20 deg mean temperature class 'O' Nitrile Rubber finished with factory fabricated black Glass cloth as per specifications. All expose piping & valves insulated with Nitrile Rubber finished with factory fabricated black Glass cloth as per specifications & 26 guage alluminum cladding as per specifications)	367.00	Mtr	3,992.00	14,65,064.00
76	MTA-AC-43	SITC of M.S. C class piping confirming to IS: 1239/3569 heavy class chilled water piping including all necessary fitting like anchor fasteners, pipe supporting frame structure, couplings, seamless bends, elbows, Tees, union, reducers, expander (ASA 150 ISRF flanges, CAF gaskets, nuts & bolts etc. insulated with Nitrile Rubber as per specifications. Moc : IS 3589-2001 ERW Heavy Gauge above 150 mm, Moc : IS 1239-I Heavy Gauge C Class up to 150 mm 80 MM DIA (38 mm thick insulation All indoor piping & valves insulated 45 Kg / cu m density, thermal conductivity 0.037 W/MK or better at 20 deg mean temperature class 'O' Nitrile Rubber finished with factory fabricated black Glass cloth as per specifications. All expose piping & valves insulated with Nitrile Rubber finished with factory fabricated black Glass cloth as per specifications & 26 guage alluminum cladding as per specifications.)	435.00	Mtr	1,423.00	6,19,005.00
77	MTA-AC-44	SITC of M.S. C class piping confirming to IS: 1239/3569 heavy class chilled water piping including all necessary fitting like anchor fasteners, pipe supporting frame structure, couplings, seamless bends, elbows, Tees, union, reducers, expander (ASA 150 ISRF flanges, CAF gaskets, nuts & bolts etc. insulated with Nitrile Rubber as per specifications. Moc : IS 3589-2001 ERW Heavy Gauge above 150 mm, Moc : IS 1239-I Heavy Gauge C Class up to 150 mm 65 MM DIA (38 mm thick insulation All indoor piping & valves insulated 45 Kg / cu m density, thermal conductivity 0.037 W/MK or better at 20 deg mean temperature class 'O' Nitrile Rubber finished with factory fabricated black Glass cloth as per specifications. All expose piping & valves insulated with Nitrile Rubber finished with factory fabricated black Glass cloth as per specifications & 26 guage alluminum cladding as per specifications.)	565.00	Mtr	1,209.00	6,83,085.00
78	MTA-AC-45	SITC of M.S. C class piping confirming to IS: 1239/3569 heavy class chilled water piping including all necessary fitting like anchor fasteners, pipe supporting frame structure, couplings, seamless bends, elbows, Tees, union, reducers, expander (ASA 150 ISRF flanges, CAF gaskets, nuts & bolts etc. insulated with Nitrile Rubber as per specifications. Moc : IS 3589-2001 ERW Heavy Gauge above 150 mm, Moc : IS 1239-I Heavy Gauge C Class up to 150 mm 50 MM DIA (38 mm thick insulation All indoor piping & valves insulated 45 Kg / cu m density, thermal conductivity 0.037 W/MK or better at 20 deg mean temperature class 'O' Nitrile Rubber finished with factory fabricated black Glass cloth as per specifications. All expose piping & valves insulated with Nitrile Rubber finished with factory fabricated black Glass cloth as per specifications & 26 guage alluminum cladding as per specifications.)	650.00	Mtr	971.00	6,31,150.00
79	MTA-AC-46	SITC of M.S. C class piping confirming to IS: 1239/3569 heavy class chilled water piping including all necessary fitting like anchor fasteners, pipe supporting frame structure, couplings, seamless bends, elbows, Tees, union, reducers, expander (ASA 150 ISRF flanges, CAF gaskets, nuts & bolts etc. insulated with Nitrile Rubber as per specifications. Moc : IS 3589-2001 ERW Heavy Gauge above 150 mm, Moc : IS 1239-I Heavy Gauge C Class up to 150 mm 40 MM DIA (38 mm thick insulation All indoor piping & valves insulated 45 Kg / cu m density, thermal conductivity 0.037 W/MK or better at 20 deg mean temperature class 'O' Nitrile Rubber finished with factory fabricated black Glass cloth as per specifications. All expose piping & valves insulated with Nitrile Rubber finished with factory fabricated black Glass cloth as per specifications & 26 guage alluminum cladding as per specifications.)	512.00	Mtr	795.00	4,07,040.00

SR.NO	REF. CODE	DESCRIPTION	QTY	UNIT	S/I/T/C RATE	S/I/T/C TOTAL AMOUNT
80	MTA-AC-47	SITC of M.S. C class piping confirming to IS: 1239/3569 heavy classchilled wate piping including all necessary fitting like anchorfasteners, pipe supporting fram structure, couplings, seamless bends, elbows, Tees, union, reducers, expander (ASA 150 ISRF flanges, CAFgaskets, nuts & bolts etc. insulated with Nitrile Rubber as perspecifications. Moc : IS 3589-2001 ERW Heavy Gauge above 150 mm, Moc : IS 1239-I Heavy Gauge C Class up to 150 mm 32 MM DIA (32 mm thick insulation All indoor piping & valves insulated 45 Kg / cu m density, thermal conductivity 0.037 W/MK or better at 20 deg mean temperature class 'O' Nitrile Rubber finished with factory fabricated black Glass cloth as per specifications. All expose piping & valves insulated with Nitrile Rubber finished with factory fabricated black Glass cloth as per specifications & 26 guage alluminum cladding as per specifications.)	1,000.00	Mtr	726.00	7,26,000.00
81	MTA-AC-54	SITC of M.S. C class piping confirming to IS: 1239/3569 heavy classchilled wate piping including all necessary fitting like anchorfasteners, pipe supporting fram structure, couplings, seamless bends, elbows, Tees, union, reducers, expander (ASA 150 ISRF flanges, CAFgaskets, nuts & bolts etc. insulated with Nitrile Rubber as perspecifications. Moc : IS 3589-2001 ERW Heavy Gauge above 150 mm, Moc : IS 1239-I Heavy Gauge C Class up to 150 mm 25 MM DIA (32 mm thick insulation All indoor piping & valves insulated 45 Kg / cu m density, thermal conductivity 0.037 W/MK or better at 20 deg mean temperature class 'O' Nitrile Rubber finished with factory fabricated black Glass cloth as per specifications. All expose piping & valves insulated with Nitrile Rubber finished with factory fabricated black Glass cloth as per specifications & 26 guage alluminum cladding as per specifications.)	532.00	Mtr	787.00	4,18,684.00
82	MTA-AC-49	SITC of M.S. C class piping confirming to IS: 1239/3569 heavy classchilled wate piping including all necessary fitting like anchorfasteners, pipe supporting fram structure, couplings, seamless bends, elbows, Tees, union, reducers, expander (ASA 150 ISRF flanges, CAFgaskets, nuts & bolts etc. insulated with Nitrile Rubber as perspecifications. Moc : IS 3589-2001 ERW Heavy Gauge above 150 mm, Moc : IS 1239-I Heavy Gauge C Class up to 150 mm 19/20 MM DIA (32 mm thick insulation All indoor piping & valves insulated 45 Kg / cu m density, thermal conductivity 0.037 W/MK or better at 20 deg mean temperature class 'O' Nitrile Rubber finished with factory fabricated black Glass cloth as per specifications. All expose piping & valves insulated with Nitrile Rubber finished with factory fabricated black Glass cloth as per specifications & 26 guage alluminum cladding as per specifications.)	834.00	Mtr	613.00	5,11,242.00
83	MTA-AC-50	SITC of 65mm dia (32 mm thick insulation) For Drain of M.S. 'B' class piping confirming to IS: 1239/3569 heavy class chilled water piping including all necessary fitting like anchor fasteners, pipe supporting frame structure, couplings, seamless bends, elbows, Tees, union, reducers, expander ASA 150 ISRF flanges, CAF gaskets, nuts & bolts etc. insulated with Nitrile Rubber as per specifications	120.00	Mtr	1,564.00	1,87,680.00
84	MTA-AC-51	SITC of 50mm dia (32 mm thick insulation) For Drain of M.S. 'B' class piping confirming to IS: 1239/3569 heavy class chilled water piping including all necessary fitting like anchor fasteners, pipe supporting frame structure, couplings, seamless bends, elbows, Tees, union, reducers, expander ASA 150 ISRF flanges, CAF gaskets, nuts & bolts etc. insulated with Nitrile Rubber as per specifications	150.00	Mtr	1,310.00	1,96,500.00
85	MTA-AC-52	SITC of 40mm dia. (32 mm thick insulation) For Drain of M.S. 'B' class piping confirming to IS: 1239/3569 heavy class chilled water piping including all necessary fitting like anchor fasteners, pipe supporting frame structure, couplings, seamless bends, elbows, Tees, union, reducers, expander ASA 150 ISRF flanges, CAF gaskets, nuts & bolts etc. insulated with Nitrile Rubber as per specifications	450.00	Mtr	1,000.00	4,50,000.00
86	MTA-AC-53	SITC of 32 mm dia (32 mm thick insulation) For Drain of M.S. 'B' class piping confirming to IS: 1239/3569 heavy class chilled water piping including all necessary fitting like anchor fasteners, pipe supporting frame structure, couplings, seamless bends, elbows, Tees, union, reducers, expander ASA 150 ISRF flanges, CAF gaskets, nuts & bolts etc. insulated with Nitrile Rubber as per specifications	250.00	Mtr	919.00	2,29,750.00
87	MTA-AC-54	SITC of 25 mm dia (32 mm thick insulation) For Drain of M.S. 'B' class piping confirming to IS: 1239/3569 heavy class chilled water piping including all necessary fitting like anchor fasteners, pipe supporting frame structure, couplings, seamless bends, elbows, Tees, union, reducers, expander ASA 150 ISRF flanges, CAF gaskets, nuts & bolts etc. insulated with Nitrile Rubber as per specifications	680.00	Mtr	787.00	5,35,160.00
		Valves & Fittings With PN 16 pressure rating				
88	MTA-AC-20	SITC of 200 mm dia. of Butterfly Valves With Insulation As Per Specification.	3.00	Nos.	27,265.00	81,795.00

SR.NO	REF. CODE	DESCRIPTION	QTY	UNIT	S/I/T/C RATE	S/I/T/C TOTAL AMOUNT
89	MTA-AC-21	SITC of 150 mm dia. of Butterfly Valves With Insulation As Per Specification.	8.00	Nos.	10,722.00	85,776.00
90	MTA-AC-22	SITC of 125 mm dia. of Butterfly Valves With Insulation As Per Specification.	1.00	Nos.	8,887.00	8,887.00
91	MTA-AC-23	SITC of 100 mm dia. of Butterfly Valves With Insulation As Per Specification.	2.00	Nos.	8,226.00	16,452.00
92	MTA-AC-56	SITC of 80 mm dia. of Butterfly Valves With Insulation As Per Specification.	1.00	Nos.	4,675.00	4,675.00
93	MTA-AC-57	SITC of 65 mm dia. of Butterfly Valves With Insulation As Per Specification.	6.00	Nos.	4,304.00	25,824.00
94	MTA-AC-58	SITC of 50 mm dia. of Butterfly Valves With Insulation As Per Specification.	10.00	Nos.	3,929.00	39,290.00
95	MTA-AC-65	SITC of 200 mm dia. of Manual Balacing Valves With Insulation As Per Specification.	1.00	Nos.	71,211.00	71,211.00
96	MTA-AC-27	SITC of 150 mm dia. of Manual Balacing Valves With Insulation As Per Specification.	3.00	Nos.	59,850.00	1,79,550.00
97	MTA-AC-66	SITC of 125 mm dia. of Manual Balacing Valves With Insulation As Per Specification.	2.00	Nos.	46,268.00	92,536.00
98	MTA-AC-67	SITC of 100 mm dia. of Manual Balacing Valves With Insulation As Per Specification.	2.00	Nos.	25,148.00	50,296.00
99	MTA-AC-68	SITC of 80 mm dia. of Manual Balacing Valves With Insulation As Per Specification.	1.00	Nos.	16,717.00	16,717.00
100	MTA-AC-69	SITC of 65 mm dia. of Manual Balacing Valves With Insulation As Per Specification.	1.00	Nos.	15,476.00	15,476.00
101	MTA-AC-70	SITC of 50 mm dia. of Manual Balacing Valves With Insulation As Per Specification.	1.00	Nos.	12,384.00	12,384.00
102	MTA-AC-65	Supply, Installation, Testing & commissioning of Balancing Valves With Insulation As Per Specification. 200 MM DIA.	3.00	Nos.	71,211.00	2,13,633.00
103	BAH-HVAC-FA-68	SITC of 100mm dia. sizes electronic, self-balancing, pressure independent type dynamic balancing valve with integrated 2 way modulating control valve in a single body. The actuator shall be capable of accepting upto 10V DC and upto 20mA 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.	1.00	Nos.	73,250.00	73,250.00
104	BAH-HVAC-FA-69	SITC of 80mm dia. sizes electronic, self-balancing, pressure independent type dynamic balancing valve with integrated 2 way modulating control valve in a single body. The actuator shall be capable of accepting upto 10V DC and upto 20mA 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.	1.00	Nos.	58,600.00	58,600.00
105	KSS-HVAC-040	SITC of 65mm dia. sizes electronic, self-balancing, pressure independent type dynamic balancing valve with integrated 2 way modulating control valve in a single body. The actuator shall be capable of accepting upto 10V DC and upto 20mA 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.	3.00	Nos.	44,768.00	1,34,304.00
106	KSS-HVAC-039	SITC of 50mm dia. sizes electronic, self-balancing, pressure independent type dynamic balancing valve with integrated 2 way modulating control valve in a single body. The actuator shall be capable of accepting upto 10V DC and upto 20mA 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.	5.00	Nos.	22,628.00	1,13,140.00
107	KSS-HVAC-038	SITC of 40mm dia. sizes electronic, self-balancing, pressure independent type dynamic balancing valve with integrated 2 way modulating control valve in a single body. The actuator shall be capable of accepting upto 10V DC and upto 20mA 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.	14.00	Nos.	19,209.00	2,68,926.00
108	KSS-HVAC-037	SITC of 32mm dia. sizes electronic, self-balancing, pressure independent type dynamic balancing valve with integrated 2 way modulating control valve in a single body. The actuator shall be capable of accepting upto 10V DC and upto 20mA 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.	13.00	Nos.	9,100.00	1,18,300.00
109	RSG-18-FA-AC-139	SITC of 200mm dia. of 'Y' Strainers With Insulation As Per Specification.	9.00	Nos.	19,728.00	1,77,552.00
110	RSG-18-FA-AC-18	SITC of 100 mm dia of 'Y' Strainers With Insulation As Per Specification.	1.00	Nos.	10,627.20	10,627.20
111	MTA-AC-74	SITC of 80 mm dia of 'Y' Strainers With Insulation As Per Specification.	1.00	Nos.	10,471.00	10,471.00
112	MTA-AC-75	SITC of 65mm dia. of 'Y' Strainers With Insulation As Per Specification.	3.00	Nos.	8,332.00	24,996.00
113	MTA-AC-76	SITC of 50mm dia. of 'Y' Strainers With Insulation As Per Specification.	5.00	Nos.	7,206.00	36,030.00
114	MTA-AC-77	SITC of 40mm dia. of 'Y' Strainers With Insulation As Per Specification.	14.00	Nos.	4,954.00	69,356.00
115	MTA-AC-78	SITC of 32mm dia. of 'Y' Strainers With Insulation As Per Specification.	13.00	Nos.	4,279.00	55,627.00
116	MTA-AC-20	SITC of 200mm dia. of Non Return Valve With Insulation As Per Specification.	9.00	Nos.	27,265.00	2,45,385.00
117	MTA-AC-33	SITC of 32mm dia. of Ball Cock With Insulation As Per Specification.	25.00	Nos.	956.00	23,900.00
118	MTA-AC-32	SITC of 40mm dia. of Ball Cock With Insulation As Per Specification.	32.00	Nos.	1,264.00	40,448.00

SR.NO	REF. CODE	DESCRIPTION	QTY	UNIT	S/I/T/C RATE	S/I/T/C TOTAL AMOUNT
119	KSS-HVAC-154	SITC of 20mm dia.of Ball Cock With for Drain As Per Specification.	86.00	Nos.	438.00	37,668.00
120	MTA-AC-81	SITC of 25mm dia.of Ball Cock With for Drain As Per Specification.	34.00	Nos.	956.00	32,504.00
121	MTA-AC-113	SITC of 200mm dia.of Motorized Butterfly Valves "On-Off" type With Controller and cabling With Insulation.	3.00	Nos.	91,094.00	2,73,282.00
122	BAH-HVAC-FA-70	SITC Ultrasonic Inline Flow Meter suitable of 200mm dia. to be installed in Chilled Water Return header with necessary fittings and isolation valves etc. The valve shall be suitable for integration with Chiller Plant Manager /Variable Primary Pump Logic Controller. The precision of flow measurement shall not be lower than +/- 2%. Quoted rates shall be inclusive of the cost of piping thermal insulations.	2.00	Nos.	15,000.00	30,000.00
123	MTA-AC-31	SITC of of Brass body Auto air vents FOR CHILLED WATER PIPES of 15 mm dia fitted with 15 mm dia Forged Brass Chromium plated body ball valve:Quoted rates shall be inclusive of the cost of piping thermal insulations.	45.00	Nos.	1,003.00	45,135.00
124	MTA-AC-35	SITC of of Dial Type Pressure Gauge the of approved Make & Range 0-10 Kg/cm2 & Dial Size 100mm. As per technical specification mention in tender.	106.00	Nos.	2,163.00	2,29,278.00
125	MTA-AC-36	SITC of of Temp Gauge with thermowell of approved Make & Range 0-50 Deg C , Dial Size 100 mm.The Temp. Guage to be of Industrial type and all Internal working Parts in SS 304 Quality. Sensor Probe Length - apx. 200mm.As per technical specification mention in tender.	82.00	Nos.	2,600.00	2,13,200.00
126	MTA-AC-37	Supply / Installation / Testing / commissioning Of Closed Expansion Tank & Centrifugal Air Separator With Insulation Alongwith All Required Accessories & Fittings, Suitable for flow rate of 1800 USGPM	1.00	Nos.	6,04,153.00	6,04,153.00
		LOW SIDE SECTION				
127	BAH-HVAC-FA-164	SITC of iron, sheet metal work consisting of CRCA sheets, various sections of iron, plates, chequered plates, rods, bars, MS pipes, etc. for panel board or any other purpose with bending, cutting, drilling and welding complete erected at the position with necessary materials duly painted with one coat of red oxide and two coats of enamel paint to match the switchgears or as per directions by the authority.	150.00	KG	154.58	23,187.00
128	MTA-AC-192	SITC of FACTORY/SITE FABRICATED rectangular sheet metal ducts,as perspecifications,made of Class VIII GP sheet as per SMACNA Standard formedium pressure air flow with MS angle/TDF flanges,supports,anchor fasteners,food grade gaskets & RTV sealant in accordance with theapproved shop drawings. it is mandatory to use factory fabricated ductsfor minimum 85% of the ducting system. Use of Site fabricated ducts should be restricted to only to suit pieces. Cold rolledsheets continuous galvanized sheet steel with zinc coating as per classVIII confirming to IS:277-1962 (revised) (where ever specified) of LFQ (Lock Forming Quality) grade. Galvanizing shall be of120gms/sq. m (Total coating on both sides). fabrication of the ductingsystem for air-conditioning & Ventilation shall confirm to SMACNA-1995 standards (HVAC Duct Construction Standards - Metal andFlexible - Second Edition 1995-SMACNA). G.I. Sheet Metal Duct(Rectangular) Ducts of following Gauge/thickness with Flanges : 26G	80.00	Sqm	938.00	75,040.00
129	R2-ME-9-47-c	SITC of 0.63 MM (24G) - Rectangular Duct FACTORY / SITE FABRICATED rectangular sheet metal ducts, as per specifications detailed in tender, made of Class VIII GP sheet as per SMACNA Standard for medium pressure air flow with MS angle / TDF flanges, supports, anchor fasteners, food grade gaskets and RTV sealant in accordance with the approved shop drawings. it is mandotary to use factory fabricated ducts for minimum 90% of the ducting system. Use of Site fabricated ducts should be restricted to only 'to suit' pieces.Cold rolled sheets continuous galvanized sheet steel with zinc coating as per class VIII confirming to IS:277-1962 (revised)(where ever specified) of LFQ (Lock Forming Quality) grade. Galvanizing shall be of 120gms/sq. m (Total coating on both sides) The fabrication of the ducting system for air-conditioning & Ventilation shall confirm to SMACNA-1995 standards ("HVAC Duct Construction Standards - Metal and Flexible - Second Edition - 1995"-SMACNA).Ducts of following Guage/thickness with Flanges, G.I. Sheet Metal Duct (Rectangular OR Round).	5,500.00	Sqm	1,665.00	91,57,500.00
130	R2-ME-9-47-b	SITC of 0.80 MM (22G) - Rectangular Duct FACTORY / SITE FABRICATED rectangular sheet metal ducts, as per specifications detailed in tender, made of Class VIII GP sheet as per SMACNA Standard for medium pressure air flow with MS angle / TDF flanges, supports, anchor fasteners, food grade gaskets and RTV sealant in accordance with the approved shop drawings. it is mandotary to use factory fabricated ducts for minimum 90% of the ducting system. Use of Site fabricated ducts should be restricted to only 'to suit' pieces.Cold rolled sheets continuous galvanized sheet steel with zinc coating as per class VIII confirming to IS:277-1962 (revised)(where ever specified) of LFQ (Lock Forming Quality) grade. Galvanizing shall be of 120gms/sq. m (Total coating on both sides) The fabrication of the ducting system for air-conditioning & Ventilation shall confirm to SMACNA-1995 standards ("HVAC Duct Construction Standards - Metal and Flexible - Second Edition - 1995"-SMACNA).Ducts of following Guage/thickness with Flanges, G.I. Sheet Metal Duct (Rectangular OR Round).	4,000.00	Sqm	1,838.00	73,52,000.00

SR.NO	REF. CODE	DESCRIPTION	QTY	UNIT	S/I/T/C RATE	S/I/T/C TOTAL AMOUNT
131	R2-ME-9-47-a	SITC of 1.00 MM (20G) - Rectangular Duct FACTORY / SITE FABRICATED rectangular sheet metal ducts, as per specifications detailed in tender, made of Class VIII GP sheet as per SMACNA Standard for medium pressure air flow with MS angle / TDF flanges, supports, anchor fasteners, food grade gaskets and RTV sealant in accordance with the approved shop drawings. it is mandatory to use factory fabricated ducts for minimum 90% of the ducting system. Use of Site fabricated ducts should be restricted to only 'to suit' pieces.Cold rolled sheets continuous galvanized sheet steel with zinc coating as per class VIII confirming to IS:277-1962 (revised)(where ever specified) of LFQ (Lock Forming Quality) grade. Galvanizing shall be of 120gms/sq. m (Total coating on both sides) The fabrication of the ducting system for air-conditioning & Ventilation shall confirm to SMACNA-1995 standards ("HVAC Duct Construction Standards - Metal and Flexible - Second Edition - 1995"-SMACNA).Ducts of following Guage/thickness with Flanges, G.I. Sheet Metal Duct (Rectangular OR Round).	500.00	Sqm	1,928.00	9,64,000.00
132	RSG-18-FA-AC-178	SITC of 1.21 MM (18G) - Rectangular Duct FACTORY / SITE FABRICATED rectangular sheet metal ducts, as per specifications detailed in tender, made of Class VIII GP sheet as per SMACNA Standard for medium pressure air flow with MS angle / TDF flanges, supports, anchor fasteners, food grade gaskets and RTV sealant in accordance with the approved shop drawings. it is mandatory to use factory fabricated ducts for minimum 90% of the ducting system. Use of Site fabricated ducts should be restricted to only 'to suit' pieces.Cold rolled sheets continuous galvanized sheet steel with zinc coating as per class VIII confirming to IS:277-1962 (revised)(where ever specified) of LFQ (Lock Forming Quality) grade. Galvanizing shall be of 120gms/sq. m (Total coating on both sides) The fabrication of the ducting system for air-conditioning & Ventilation shall confirm to SMACNA-1995 standards ("HVAC Duct Construction Standards - Metal and Flexible - Second Edition - 1995"-SMACNA).Ducts of following Guage/thickness with Flanges, G.I. Sheet Metal Duct (Rectangular OR Round).	300.000	Sqm	1,550.00	4,65,000.00
133	R2-ME-9-48-a	SITC of 0.63 MM (24G) - Rectangular Duct SITC of of FACTORY / SITE FABRICATED Alluminium ducts , as per specifications detailed in tender, made of Class VIII GP sheet as per SMACNA Standard for medium pressure air flow with MS angle / TDF flanges, supports, anchor fasteners, food grade gaskets and RTV sealant in accordance with the approved shop drawings. it is mandatory to use factory fabricated ducts for minimum 90% of the ducting system. Use of Site fabricated ducts should be restricted to only 'to suit' pieces.Cold rolled sheets continuous galvanized sheet steel with zinc coating as per class VIII confirming to IS:277-1962 For MRI, OT , +Ve Isolation & Combined Isolation room in accordance with the approved shop drawings and as required by the specifications.Aluminium sheet will be as per ISS:737-1955 and fabrication will be as per IS-655/SMACNA. All necessary Aluminium supports using aluminium thread rods (as directed) and aluminium anchor bolts, food grade neoprene gaskets, food grade adhesive, food grade silicon sealant ,Aluminium turning vanes, splitters shall be included in the scope.No slip joint is allowed in any type of ducting.Only flanged joint with food grade rubber gasket is allowed.Duct Pressure testing of all main duct and main branches as per latest SMACNA standard for permissible air leakage shall be inclusive in the cost.No smoke or light test of duct is permitted.All duct joint, corners,flanges joints etc. shall be properly covered with food grade silicon sealant for leak proof application inspite of leak proof duct joints.Aluminium gauge shall be one gauge higher than as that of required for GI as per the duct sizes	900.00	Sqm	2,574.00	23,16,600.00
134	R2-ME-9-48-b	SITC of 0.80 MM (22G) - Rectangular Duct SITC of of FACTORY / SITE FABRICATED Alluminium ducts , as per specifications detailed in tender, made of Class VIII GP sheet as per SMACNA Standard for medium pressure air flow with MS angle / TDF flanges, supports, anchor fasteners, food grade gaskets and RTV sealant in accordance with the approved shop drawings. it is mandatory to use factory fabricated ducts for minimum 90% of the ducting system. Use of Site fabricated ducts should be restricted to only 'to suit' pieces.Cold rolled sheets continuous galvanized sheet steel with zinc coating as per class VIII confirming to IS:277-1962 For MRI, OT , +Ve Isolation & Combined Isolation room in accordance with the approved shop drawings and as required by the specifications.Aluminium sheet will be as per ISS:737-1955 and fabrication will be as per IS-655/SMACNA. All necessary Aluminium supports using aluminium thread rods (as directed) and aluminium anchor bolts, food grade neoprene gaskets, food grade adhesive, food grade silicon sealant ,Aluminium turning vanes, splitters shall be included in the scope.No slip joint is allowed in any type of ducting.Only flanged joint with food grade rubber gasket is allowed.Duct Pressure testing of all main duct and main branches as per latest SMACNA standard for permissible air leakage shall be inclusive in the cost.No smoke or light test of duct is permitted.All duct joint, corners,flanges joints etc. shall be properly covered with food grade silicon sealant for leak proof application inspite of leak proof duct joints.Aluminium gauge shall be one gauge higher than as that of required for GI as per the duct sizes	250.00	Sqm	1,919.00	4,79,750.00

SR.NO	REF. CODE	DESCRIPTION	QTY	UNIT	S/I/T/C RATE	S/I/T/C TOTAL AMOUNT
135	BAH-HVAC-FA-72	SITC of of 3 MM THICK MILD STEEL (MS) FABRICATED/ AND FULLY LEAKPROOF WELDED JOINT DUCTS AND ALL ANCILLORIES PAINTED WITH 2 COATS OF ANTI-RUST PAINT (FOR KITCHEN EXHAUST) in accordance with the approved shop drawings and as required by the specifications.fabrication will be as per IS-655/SMACNA.All necessary MS dampers in main duct and sub branches , MS hangers, supports using thread rods (as directed) and anchor bolts, food grade neoprene gaskets, food grade adhesive, turning vanes, splitters, flanges with nut bolts ,washer etc.	150.00	Sqm	3,200.00	4,80,000.00
136	R2-ME-9-32	Supply,installation,testing and commissioning of extruded aluminium powder coated linear/Curved Grilles for Supply /Return grill with volume control dampers.	50.00	Sqm	17,551.00	8,77,550.00
137	R2-ME-9-30	Supply / Installation / Testing / commissioning Of Aluminium Aerfoil volume control dampers within ducts complete with suitable links,levers and quadrants for manual control of volume of airflow and for proper balancing of air distribution system.	70.00	Sqm	13,261.00	9,28,270.00
138	KSS-HVAC-207	SITC of extruded aluminium powder coated 4way Supply diffuser with volume control dampers.	150.00	Sqm	10,713.00	16,06,950.00
139	KSS-HVAC-206	SITC of extruded aluminium powder coated 4way Return diffuser without volume control damper	250.00	Sqm	6,813.00	17,03,250.00
140	KSS-HVAC-208	SITC of extruded aluminium louvers with frame bird screen 50mm prefilter frame, mounted arrangement etc. as per specification and drawing.	35.00	Sqm	6,593.00	2,30,755.00
140	MTA-AC-199	Supply, installation, testing and commissioning Dampers. (Fire Dampers G.I shall meet the fire resistance rating of 2 hours as per UL555 and shall be tested and certified by CBRI.Fire Damper frame shall be galvanized steel of 1.6mm thickness, formed into a C channel in 4-piece construction with flanges suitable for duct connection. Damper Blades shall be single skin galvanized steel of 1.6mm thickness and must have 3 accurately rollformed longitudinal grooves for reinforcement and proper closure and operation. The blades shall be arranged in parallel to provide positive shut off. Each Blade shall have axles supported on both sides with sintered bronze self lubricating bearings turning in an extruded hole in the frame. All Blades shall be interconnected using linkage in the frame section . Each Damper shall be operated through a actuator. Each Damper shall be supplied with a factory mounted sleeve made from Minimum 1mm thick galvanized steel of minimum 250mm length)	20.00	Sqm	18,043.00	3,60,860.00
141	MTA-AC-200	Supply, installation, testing and commissioning Actuators(necessary cabling)	100.00	Nos.	10,507.00	10,50,700.00
142	BAH-HVAC-FA-73	Supply, fabrication, installation an testing of flexible canvass connections constructed between ductable unit / dampers / ducting of required size with fire resist flexible double canvas sleeve complete.	164.00	Nos.	1,500.00	2,46,000.00
143	BAH-HVAC-FA-165	SITC of Of Fresh Air GI Duct Dampers with bird screen & Cowl Piece air AC.	12.00	Sqm	7,032.80	84,393.60
144	BAH-HVAC-FA-74	SITC of Aluminum made factory fabricated Laminar Flow OT Plenum of 14 gauge thickness comprising of Terminal MERV- 17 HEPA Filters of 99.997% Efficiency down to 0.3 Micron particle size installed in zero leakage Aluminum made frame with Aluminum made perforated plate type SA grille inclusive with all necessary 4 nos. supply air Aluminum made VCD in supply air tappings to plenum.All necessary supporting Aluminum made structure , Aluminum made hangers,Aluminium made nut ,bolts, washers, Aluminum made channels, Aluminum made fasteners etc. shall be part of scope of supply. The contractor shall submit the GA drawing with technical specification before ordering for the OT plenum.OT plenum shall be designed at minimum at 25-35 CFM per Sq.Ft of supply air diffuser outlet terminal velocity (As per ASHARE 170 guideline) suitable for CFM mentioned in tender drawing. Size : 8 feet x 8 feet	8.00	Nos.	75,000.00	6,00,000.00
145	BAH-HVAC-FA-79	SITC of Laminar Air Flow System of size 2500mm X 2500mm X 800mm. The laminar should be constructed with Aluminium sheet Laminar system will introduce the highest air quality into the operation theatre. Air should be diffused into the room uniformly over the total area through perforated SS 304. The air diffusers should be installed in a manner which allows them to be removed for easy maintenance of air filter. HEPA filters (MERV-17) of H14 Grade 99.97% efficiency are used to ensure high quality clean air is supplied and <u>under tight control of bacterial infection system</u>	8.00	Nos.	5,15,000.00	41,20,000.00
146	BAH-HVAC-FA-81	SITC of Of inside wall mounted Aluminium body Pressure Relief Damper to maintain 10 Pascal Pressure positive pressure difference complete with all design counter weight accessories etc.	18.00	Nos.	8,500.00	1,53,000.00
		INSULATION				
147	RSG-18-FA-AC-57	SITC of 15mm thick Internal Duct accoustic insulation using food grade adhesive with open cell structured Fire Retardant nitrile rubber with minimum density 150 kg/m3 from inside of the AHU supply air ducting upto 3 mtr.length from AHU mouth as per the specifications.	250.00	Sqm	698.00	1,74,500.00

SR.NO	REF. CODE	DESCRIPTION	QTY	UNIT	S/I/T/C RATE	S/I/T/C TOTAL AMOUNT
148	MTA-AC-208	SITC Of Thermal Insulation Of 19 MM THK (On Terrace) for Supply Ducts with Nitrile Rubber With Glass Cloth & UV Paint For Exposed to Atmosphere. Note :- (Return air ducts Duct Thermal insulation fire retardant , closed cell structured factory laminated 7 mill glass cloth EPDM insulation of density 25 kg/m3 shall be with two coats of lag coating (Anti-fungal & vapour barrier -5590 standard) wrapped with glass woven clothed surface For Supply and return insulation)	150.00	Sqm	990.00	1,48,500.00
149	MTA-AC-207	Supply, Installation, Testing & commissioning Of Thermal Insulation Of12 MM THK (In Shaft) for Supply Ducts with Nitrile Rubber With GlassCloth & UV Paint For Exposed to Atmosphere. Note :- (supply Air ducts Duct Thermal insulation fire retardant , closed cell structured factory laminated 7 mill glass cloth EPDM insulation of density 25 kg/m3 shall be with two coats of lag coating (Anti-fungal & vapour barrier -5590 standard) wrapped with glass woven clothed surface For Supply and return insulation)	1,500.00	Sqm	811.00	12,16,500.00
150	BAH-HVAC-FA-82	SITC of 25 mm thick insulation for supply Air,Fresh air duct Thermal insulation of fire retardant shall be applicable for following areas OT's, & Precision AC under flooring.The duct thermal insulation material shall be of closed cell structure nitrile rubber with factory laminated 7 mill glass cloth of density 40-60 kg/m3. The duct adhesive shall be as per OEM. The product shall have temeprature range of 40°C to 105°C. The insulation material shall be fire rated for Class 0 as per BS 476 Part 6 : 1989 for fire propagation test and for Class 1 as per BS 476 Part 7, 1987 for surface spread of flame test. It should be CFC free.It should not be non-corrosive to copper and stainless when tested as per DIN 1988. The material should not develop crack when tested for Ozone resistance as per ASTM 1149. No cracks should be develop when exposed to UV as per ASTM G 154-04.The resistance microbiological growth should be in accordance to UL 181-and meet the acceptance criteria of resistance to fungal contamination as per ASTM G21. It should meet the acceptance criteria of resistance to bacterial contamination as per ASTM 2180.	8,200.00	Sqm	1,350.00	1,10,70,000.00
151	BAH-HVAC-FA-83	SITC of 13 mm thick insulation for Return air ducts Thermal insulation of fire retardant shall be applicable for following areas OT's,.The duct thermal insulation material shall be of closed cell structure nitrile rubber with factory laminated 7 mill glass cloth of density 40-60 kg/m3. The duct adhesive shall be as per OEM. The product shall have temeprature range of -40°C to 105°C. The insulation material shall be fire rated for Class 0 as per BS 476 Part 6 : 1989 for fire propagation test and for Class 1 as per BS 476 Part 7, 1987 for surface spread of flame test. It should be CFC free.It should not be non-corrosive to copper and stainless when tested as per DIN 1988. The material should not develop crack when tested for Ozone resistance as per ASTM 1149. No cracks should be develop when exposed to UV as per ASTM G 154-04.The resistance microbiological growth should be in accordance to UL 181-and meet the acceptance criteria of resistance to fungal contamination as per ASTM G21. It should meet the acceptance criteria of resistance to bacterial contamination as per ASTM 2180.	2,000.00	Sqm	900.00	18,00,000.00
152	MTA-AC-209	SITC Of AHU Room Wall Acoustic Insulation with 20mm THK Nitrile Rubber as per specification. (AHU Room Acoustic insulation using food grade adhesive with open cell structured Fire Retardant nitrile rubber with density minimum 150 kg/m3 with all necessary fixing arrangements as per the specifications.)	150.00	Sqm	1,799.00	2,69,850.00
153	BAH-HVAC-FA-84	SITC of 25mm thick Underdeck insulation. Area shall be insulated with Physically cross-linked polyolefin foam with factory applied reinforced aluminium foil and acrylic adhesive backing. Insulation shall have Density of 25 kg/m3 (foam core only), Thermal Conductivity (ASTM C518) of Maximum 0.032 W/m.°K at mean temperature 23°C, Water Vapour permeability (ASTM E96): Maximum 2.3 x 10-15 kg/Pa.s.m, (μ >80,000), Water absorption: <0.2 % v/v. Complies with Class 0 to BS476 Parts 6 and 7, Euroclass B-S2,d0 classification according to EN 13501Part 1, NFPA 90A and B (ASTM E84 25/50 rating), FM 4924 fire performance criteria and "FM Approved" by FM Approvals certification body and Zero mould growth when tested to ASTM G21. Seal all joints with 75mm reinforced aluminium foil tape.	1,000.00	Sqm	750.00	7,50,000.00
154	RSG-18-FA-AC-60	SITC of of false ceiling shall be insulated with 50 mm thick fiberglass slab of 16 Kg. / Cu. M. density. The fiberglass slab shall be wrapped in polyethylene bags.	50.00	Sqm	413.00	20,650.00
		VENTILATION				
155	RSG-18-FA-AC-97	SITC of PROPELLER FAN - 150 CFM / 5 MM ST.PR. Wall Mounted Propeller Fans For Toilet / pantry etc.	110.00	Nos.	7,800.00	8,58,000.00
156	RBH-FA-AC-130	SITC of PROPELLER FAN - 200 CFM / 5 MM ST.PR. Wall Mounted Propeller Fans For Toilet / pantry etc.	25.00	Nos.	7,500.00	1,87,500.00
157	MTA-AC-284	SITC of Free Flow Type Wall Mounted Exhaust Air Fan for toilets &Pantry Area of capacity: 300 CFM (5mm st.Pr.)	5.00	Nos.	4,788.00	23,940.00
158	BAH-HVAC-FA-85	SITC of PROPELLER FAN - 600 CFM / 5 MM ST.PR. Wall Mounted Propeller Fans For Toilet / pantry etc.	5.00	Nos.	18,500.00	92,500.00

SR.NO	REF. CODE	DESCRIPTION	QTY	UNIT	S/I/T/C RATE	S/I/T/C TOTAL AMOUNT
159	BAH-HVAC-FA-135	SITC of 42,500 CFM / 50MM ST.PR./ TUBE AXAL / STP UG TANK Tube Axial Exhaust Air Fans & Casing drive, motor, mounting frame, starter, isolator , Necessary cabling & earthing strip & Filter For Following Capacities :As per AMCA210 standard "Laboratory Methods of testing fans for rating" Balancing quality - As per AMCA204 / ISO 1940 standard With With VFD With Bypass Stater Panel Compatability wirh BMS and its accessories and cabling.	1.00	Nos.	8,85,000.00	8,85,000.00
160	BAH-HVAC-FA-136	SITC of 38,000 CFM / 50MM ST.PR./ TUBE AXAL / STP UG TANK Tube Axial Fresh Air Fans & Casing drive, motor, mounting frame, starter, isolator , Necessary cabling & earthing strip & Filter For Following Capacities :As per AMCA210 standard "Laboratory Methods of testing fans for rating" Balancing quality - As per AMCA204 / ISO 1940 standard With With VFD With Bypass Stater Panel Compatability wirh BMS and its accessories and cabling.	1.00	Nos.	7,95,000.00	7,95,000.00
161	BAH-HVAC-FA-137	SITC of 30,000 CFM / 40MM ST.PR./ TUBE AXAL / STAIRCASE PRESSURIZATION Floor Mounted Tube Axial Frash Air Fans & Casing With Drive Package & Necessary cabling & earthing strip For Following Capacities For Staircase Pressurization With With VFD With Bypass Stater Panel Compatability wirh BMS and its accessories and cabling.	10.00	Nos.	6,35,000.00	63,50,000.00
162	BAH-HVAC-FA-138	SITC of 15,500 CFM / 40MM ST.PR./ TUBE AXAL / LIFT WELL PRESSURIZATION Floor Mounted Tube Axial Frash Air Fans & Casing With Drive Package & Necessary cabling & earthing strip For Following Capacities For Lift Pressurization With With VFD With Bypass Stater Panel Compatability wirh BMS and its accessories and cabling.	18.00	Nos.	3,45,000.00	62,10,000.00
163	BAH-HVAC-FA-139	SITC of 10,000 CFM / 40MM ST.PR./ TUBE AXAL / LIFT LOBBY PRESSURIZATION (RIGHT/LEFT SIDE) Floor Mounted Tube Axial Frash Air Fans & Casing With Drive Package & Necessary cabling & earthing strip For Following Capacities For Lift Lobby Pressurization With With VFD With Bypass Stater Panel Compatability wirh BMS and its accessories and cabling.	2.00	Nos.	2,35,000.00	4,70,000.00
164	BAH-HVAC-FA-140	SITC of 20,000 CFM / 40MM ST.PR./ TUBE AXAL / LIFT LOBBY PRESSURIZATION (RIGHT/LEFT SIDE) Floor Mounted Tube Axial Frash Air Fans & Casing With Drive Package & Necessary cabling & earthing strip For Following Capacities For Lift Lobby Pressurization With With VFD With Bypass Stater Panel Compatability wirh BMS and its accessories and cabling.	2.00	Nos.	4,35,000.00	8,70,000.00
165	BAH-HVAC-FA-141	SITC of Of Tube Axial Air Quantity 25,000 CFM, Static Pressure 40 MM; Exhaust Air Fans & Casing drive, motor, mounting frame, starter, isolator , Necessary cabling & earthing strip & Filter For Following Capacities :As per AMCA210 standard "Laboratory Methods of testing fans for rating" Balancing quality - As per AMCA204 / ISO 1940 standard With With VFD With Stater Panel Compatability wirh BMS and its accessories and cabling. Fire Rating 300° C for minimum 60 minutes. 3 Nos. Of Fans. (2 Fans are working When Normal Mode & All Are fans Are Working In Case Of Fire Mode) with suitable to work on various modes. sound attenuator Piece for sound abosrtion included.	3.00	Nos.	7,50,000.00	22,50,000.00
166	FAIR ITEM	SITC of Of Tube Axial Air Quantity 20,000 CFM, Static Pressure 40 MM Exhaust Air Fans & Casing drive, motor, mounting frame, starter, isolator , Necessary cabling & earthing strip & Filter For Following Capacities :As per AMCA210 standard "Laboratory Methods of testing fans for rating" Balancing quality - As per AMCA204 / ISO 1940 standard With With VFD With Stater Panel Compatability wirh BMS and its accessories and cabling.; Fire Rating 300° C for minimum 60 minutes. 2 Nos. Of Fans. (1 Fans are working When Normal Mode & All Are fans Are Working In Case Of Fire Mode) with suitable to work on various modes. sound attenuator Piece for sound abosrtion included.	2.00	Nos.	3,42,500.00	6,85,000.00
167	BAH-HVAC-FA-143	SITC of Commercial Deodorizer for STP Plant (Ozone Generator) Exhaust Air Quantities - 21,250 CFM. in Stainless Steel Construction suitable to discharge ozone in ducts, producing high volume of ozone via corona discharge method. The unit must have separate chambers for elctrical components & ozone generation, with isolation. Air intake to the unit shall be thru Hydrophobic pre filter, to contain moisture from getting in to the unit. Unit must s provided with 2 fans, one for pre/ after cooling of electrical componenets & one for ozone injection in to the duct. Cabinet -1.2 mm Stainless Steel, Ozone Generation - Corona Discharge, Pre Filter - Hydropobic for air inlet, Nozzle Dia - 100 mm, Ozone Plate Life - 3000 hrs, Unit access - from side, Ballast & Other electrical components - Out of the air flow. Power Supply - 220 V/ 50 Hz.	2.00	Nos	11,68,750.00	23,37,500.00

SR.NO	REF. CODE	DESCRIPTION	QTY	UNIT	S/I/T/C RATE	S/I/T/C TOTAL AMOUNT
168	BAH-HVAC-FA-144	SITC of Scrubber 7,750 CFM 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. It also include require co-ordination and connecting pieces to installation the scrubber along with respective exhaust air fans: 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 above 7,750 CFM shall be equipped with Pulse width modulating (PWM)The system should be fitted with interlock switch for safety . The syste should allo connection to a fan section to achieve 500 FPM velocity across the air cleaner with scrubber panel.	5.00	Nos	6,58,750.00	32,93,750.00
169	RSG-18-FA-AC-62	SITC of PLC Cum Control Panel Design, BMS compatible power and control panel with all necessary control logics and software for each zone. PLC: which will consist of MODBUS for connectivity to BMS system for monitoring the system & programmed for pollution mode as per the enclosed write up CO sensors 30ppm & cyclic mode. When the pollution level goes beyond 100ppm whole system should run in high speed. POWER CONTROL PANEL: Exhaust fans as per the BOQ NOTE: Should have the provision for hooking up the panel with fire fireting panel in case of emergecny Should have the provision for monitoring the whole system through BMS (Not individual fans), CO Sensors- A carbon dioxide sensor or CO2 sensor is an instrument for the measurement of carbon dioxide gas & Measuring carbon dioxide is important in monitoring indoor air quality.	1.00	Nos.	5,41,260.00	5,41,260.00
170	MTA-AC-294	Supply / Installation / Testing & Commissioning of CO sensors as required.	18.00	Nos.	29,260.00	5,26,680.00
171	MTA-AC-295	CFD Analysis For Individual Levels	1.00	Nos.	1,33,000.00	1,33,000.00
		Cabling				
172	RSG-18-FA-AC-65	Supply, installation, tesitng and commissioning of Armoured FRLS power & control cabling for all fans and CO sensors with Saddles Earthing copper wire & instllation 3C x 1.5 sq.mm The cable include the termination, double compression glands, lugs, tags etc. (suitable enclosure of CO sensors, if any).	300.00	Mtr	210.00	63,000.00
173	RSG-18-FA-AC-66	Supply, installation, tesitng and commissioning of Armoured FRLS power & control cabling for all fans and CO sensors with Saddle Earthing copper wire & and CO sensors with Saddle Earthing copper wire & and CO sensors with Saddle Earthing copper wire & installation 3C x 2.5 sq.mm The cable include the termination, double compression glands, lugs, tags etc.	300.00	Mtr	234.00	70,200.00
174	RSG-18-FA-AC-67	Supply, installation, tesitng and commissioning of Armoured FRLS power & control cabling for all fans and CO sensors with Saddle Earthing copper wire & installation 3C x 4 sq.mm The cable include the termination, double compression glands, lugs, tags etc.	200.00	Mtr	247.00	49,400.00
175	MTA-AC-280	Supply / Installation / Testing & Commissioning of Jet Fans complete with Silencers, guards, & mounting assembly for following specifications: Tip Velocity : 16 Meter / Second Air Flow : 1.8 Cubic Meter / Second RPM : 2840 / 1420 Sound Level : Not more than 54db at 2840 RPM at 1.5m Distance Fire Rating : 300°C for minimum 60 Min.	8.00	Nos.	1,17,040.00	9,36,320.00
176	R2-ME-2-3a-f	SITC of XLPE armoured cable 3 core 2.5 sq. mm. 1.1 kV grade stranded Cu conductor, XLPE insulated, extruded PVC inner and outer sheathed FRLSHZ, galvanized steel round or strip armoured cables (SP-ME-TS- 6).	100.00	Mtr	142.00	14,200.00
177	R2-ME-2-3a-o	SITC of XLPE armoured cable 4 core 6 sq. mm. 1.1 kV grade stranded Cu conductor, XLPE insulated, extruded PVC inner and outer sheathed FRLSHZ, galvanized steel round or strip armoured cables (SP-ME-TS- 6).	40.00	Mtr	337.00	13,480.00
178	R2-ME-2-3a-s	SITC of XLPE armoured cable 4 core 10 sq. mm. 1.1 kV grade stranded Cu conductor, XLPE insulated, extruded PVC inner and outer sheathed FRLSHZ, galvanized steel round or strip armoured cables (SP-ME-TS- 6).	50.00	Mtr	597.00	29,850.00

SR.NO	REF. CODE	DESCRIPTION	QTY	UNIT	S/I/T/C RATE	S/I/T/C TOTAL AMOUNT
179	R2-ME-2-12-g	SITC of XLPE armoured cable 3 core 2.5 sq. mm.Cable end terminations for LV, XLPE/PVC insulated, PVC sheathed, armoured/unarmoured cables including supply and fixing of Double compression cable glands, stripping of cable insulation, supply and fixing of tinned plated copper lugs for copper cables for all phases and crimping the same to the conductor for the following cables. Miscellaneous items like cable lugs, G.I nut - bolts and G.I washers , consumables and other hardware materials as required to make the installation complete, are in the scope. All G.I Nut, bolt and washers shall be HDGI with 80 micron. One set of termination includes gland, lugs for cable core & accessories.	4.00	Set	113.00	452.00
180	R2-ME-2-12-r	SITC of XLPE armoured cable 4 core 6 sq. mm. Cable end terminations for LV, XLPE/PVC insulated, PVC sheathed, armoured/unarmoured cables including supply and fixing of Double compression cable glands, stripping of cable insulation, supply and fixing of tinned plated copper lugs for copper cables for all phases and crimping the same to the conductor for the following cables. Miscellaneous items like cable lugs, G.I nut - bolts and G.I washers , consumables and other hardware materials as required to make the installation complete, are in the scope. All G.I Nut, bolt and washers shall be HDGI with 80 micron. One set of termination includes gland, lugs for cable core & accessories.	4.00	Set	186.00	744.00
181	R2-ME-2-12-s	SITC of XLPE armoured cable 4 core 10 sq. mm. Cable end terminations for LV, XLPE/PVC insulated, PVC sheathed, armoured/unarmoured cables including supply and fixing of Double compression cable glands, stripping of cable insulation, supply and fixing of tinned plated copper lugs for copper cables for all phases and crimping the same to the conductor for the following cables. Miscellaneous items like cable lugs, G.I nut - bolts and G.I washers , consumables and other hardware materials as required to make the installation complete, are in the scope. All G.I Nut, bolt and washers shall be HDGI with 80 micron. One set of termination includes gland, lugs for cable core & accessories.	10.00	Set	199.00	1,990.00
182	BAH-HVAC-FA-166	Providing & erecting Hot dipped galvanized perforated type cable tray manufactured from 16 swg (1.6 mm thick) GI sheet of 300 mm width & 75 mm height complete with necessary coupler plates & hardware in approved manner.for Outdoor refrigerant piping with cover of following sizes GI 16swg Ladder type cable rack system made out of Pre Galvanized steel folded to required shape with adequate number of supports. The cable rack shall have runners rags of suitable size, horizontal elbow, vertical elbow 90 Deg. Up vertical elbow 90 Deg. Down, re-deep, coupler plates, materials. The cable racks shall be suspended from ceiling supported from side walls in columns etc. with adequate size supporting angles / channels with fasteners, welding, anchor bolts, nuts etc. The rack shall have suitable cable clamping arrangements etc.The metal rack system shall be treated with one coat of rubber based polyvinyl paint as primer and finished with two coats of green enamel paint complete with all civil works for fabrication details.	50.00	Mtr	842.52	42,126.00
183	BAH-HVAC-FA-167	Providing & erecting Hot dipped galvanized perforated type cable tray manufactured from 16 swg (1.6 mm thick) GI sheet of 200 mm width & 75 mm height complete with necessary coupler plates & hardware in approved manner.for Outdoor refrigerant piping with cover of following sizes GI 16swg Ladder type cable rack system made out of Pre Galvanized steel folded to required shape with adequate number of supports. The cable rack shall have runners rags of suitable size, horizontal elbow, vertical elbow 90 Deg. Up vertical elbow 90 Deg. Down, re-deep, coupler plates, materials. The cable racks shall be suspended from ceiling supported from side walls in columns etc. with adequate size supporting angles / channels with fasteners, welding, anchor bolts, nuts etc. The rack shall have suitable cable clamping arrangements etc.The metal rack system shall be treated with one coat of rubber based polyvinyl paint as primer and finished with two coats of green enamel paint complete with all civil works for fabrication details.	100.00	Mtr	660.80	66,080.00
184	BAH-HVAC-FA-168	Providing & erecting Hot dipped galvanized perforated type cable tray manufactured from 16 swg (1.6 mm thick) GI sheet of 150 mm width & 75 mm height complete with necessary coupler plates & hardware in approved manner.for Outdoor refrigerant piping with cover of following sizes GI 16swg Ladder type cable rack system made out of Pre Galvanized steel folded to required shape with adequate number of supports. The cable rack shall have runners rags of suitable size, horizontal elbow, vertical elbow 90 Deg. Up vertical elbow 90 Deg. Down, re-deep, coupler plates, materials. The cable racks shall be suspended from ceiling supported from side walls in columns etc. with adequate size supporting angles / channels with fasteners, welding, anchor bolts, nuts etc. The rack shall have suitable cable clamping arrangements etc.The metal rack system shall be treated with one coat of rubber based polyvinyl paint as primer and finished with two coats of green enamel paint complete with all civil works for fabrication details.	40.00	Mtr	569.94	22,797.60
185	MTA-AC-293	Mounting : Ceiling suspended Steel structure for Fans installation along with Anchor Fasteners (Hilti)	7.00	Nos.	17,100.00	1,19,700.00

SR.NO	REF. CODE	DESCRIPTION	QTY	UNIT	S/I/T/C RATE	S/I/T/C TOTAL AMOUNT
		<p>SITC of Heatpipe for the AHUs as mentioned & wherever required with the following capacities. Vendor shall do all the Parameters w.r.to the AHU as per design capacity & requirements for the selections and submit the same for Approval to concern incharge/Consultant.</p> <p>Heat pipes for enhanced dehumidification shall be of the 'wrap-around' type included in the AHU around the main cooling coil. The heat pipes shall consist of a precool and reheat fin block. Heat pipes will be delivered to the AHU manufacturer fully factory charged and sealed. A minimum of 100mm gap should be allowed between the leaving face of the cooling coil and the entering face of the heat pipe reheat section. This gap will permit the installation of sensors or other instrumentation to monitor the condition of the air after the cooling coil.</p> <p>The external fins shall be of aluminium with a minimum thickness of 0.14mm. Fins shall be of the continuous plate type to maximize the external surface area rather than individually finned tube pattern. The fins shall be of the rippled or louvered type to suit the application and spaced at such a distance as required by the conditions specified. If necessary, fin spacing may differ between the two sections of the heat pipe. In corrosive atmospheres copper fins, vinyl pre coated aluminium, or Bronzeglow/Heresite post coated aluminium may be used.</p> <p>Tubes shall be of refrigeration standard seamless copper C106 for heat exchanger use. Tube diameter shall be a minimum of 12.7mm with a grooved inner surface to enhance the internal surface area and prevent pooling of liquid. The minimum root thickness of the tube shall be 0.35mm. Casings shall be from galvanized sheet steel with a minimum thickness of 1.5 mm. The casing shall incorporate tube plates, side plates and intermediate stiffening plates as required. (Refer the specs for detailed TDS)</p>				

SR.NO	REF. CODE	DESCRIPTION	QTY	UNIT	S/I/T/C RATE	S/I/T/C TOTAL AMOUNT
186	FAIR ITEM	Capacity upto 4000CFM	12.00	Nos.	1,45,000.00	17,40,000.00
187	FAIR ITEM	Capacity upto 7000CFM	2.00	Nos.	2,25,000.00	4,50,000.00
188	FAIR ITEM	Capacity upto 10000CFM	2.00	Nos.	4,05,000.00	8,10,000.00
189	Fair-Topiwala-AC-07	Supply Installation testing & Commissioning of ASPEN Make Drain Pumps, 12 L/h , Lift 2 m, with Discharge tube,safety switch & all Necessary accessories for Hi Wall Units.	12.00	Nos.	5,120.00	61,440.00
190	Fair-Topiwala-AC-15	Supply, installation and adjusting of disc valves suitable for exhausting toilet foul air ,comprising of an adjustable centre cone and coupling sleeve made of Aluminum sheet duly epoxy painted with approved color. The disc valve shall be fitted with a galvanised steel installation frame and the sleeve shall incorporate a foam-rubber gasket for airtight sealing. The centre cone should be adjustable for balancing and with a locking arrangement to maintain the desired flow rate. - 150mm Dia	280.00	Nos.	1,416.00	3,96,480.00
191	Fair-Topiwala-AC-58	Supply,installation,testing & commisioning of CAR Silicon bulb pressurized type as Specified below : Duct size 150mm x 100mm , Size 5" Air Quantity : 60-140 cfm	100.00	Nos.	2,100.00	2,10,000.00
		Supplying, installing, testing and commissioning of INLINE / INLINE CABINET FANS suitable for installing in any position in vertical or horizontal ducts. The casing shall be double skin, internally acoustically lined and constructed of galvanised steel. The fan shall be DIDW with forward curve impeller fitted with maintenance free external rotor motor. The motor shall be suitable for 220±10% volt single phase 50 cycles AC supply. All units shall be complete with duct flexible connector and volume control damper. The fan shall have low sound level exceeding not more than 40DBA at three metre distance. Cabling: Power cabling of copper armoured cable from control panel to motor with double compression gland. Cabling and earthing limited to 20 RMT max. Regulator shall be included in the cost along with the MCB/Panel required as per motor/fan Rating. Quoted cost shall include BMS Compatible control & starter panel for 3-phase motor fans. Necessary copper earthing should also be included. Cabling and earthing as required from Fan Elec.Panel to Fan motor shall be considered as included in this scope & no separate				
192	Fair-Topiwala-AC-29	900 cfm capacity with 25 mm static pressure Fresh Air	2.00	Nos.	21,240.00	42,480.00
193	Fair-Topiwala-AC-28	1100 cfm capacity with 30 mm static pressure Exhaust air / Fresh air	3.00	Nos.	25,960.00	77,880.00
194	Fair-Topiwala-AC-32	1300 cfm capacity with 30 mm static pressure Exhaust air / Fresh air	3.00	Nos.	30,680.00	92,040.00
195	Fair-Topiwala-AC-45	1500 cfm capacity with 30 mm static pressure Exhaust air / Fresh Air	2.00	Nos.	35,400.00	70,800.00
196	Fair-Topiwala-AC-40	1800 cfm capacity with 30 mm static pressure Exhaust air / Fresh Air	3.00	Nos.	42,480.00	1,27,440.00
197	Fair-Topiwala-AC-46	1900 cfm capacity with 30 mm static pressure Exhaust air / Fresh Air	2.00	Nos.	44,840.00	89,680.00
198	Fair-Topiwala-AC-27	600 cfm capacity with 25 mm static pressure Exhasut / Fresh Air	29.00	Nos.	14,160.00	4,10,640.00
199	Fair-Topiwala-AC-30	700 cfm capacity with 30 mm static pressure Exhaust/ Fresh Air	36.00	Nos.	16,520.00	5,94,720.00
200	Fair-Topiwala-AC-25	200 cfm capacity with 25 mm static pressure Exhasut/ffresh Air	26.00	Nos.	4,720.00	1,22,720.00
201	Fair-Topiwala-AC-26	300 cfm capacity with 25 mm static pressure Exhasut/ffresh Air	18.00	Nos.	7,080.00	1,27,440.00
202	Fair-Topiwala-AC-52	500 cfm capacity with 30 mm static pressure Exhaust/Fresh Air	17.00	Nos.	11,800.00	2,00,600.00
203	Fair-Topiwala-AC-38	550 cfm capacity with 30 mm static pressure Exhasut/Fresh Air	12.00	Nos.	12,980.00	1,55,760.00
204	Fair-Topiwala-AC-39	400 cfm capacity with 30 mm static pressure Exhaust/Fresh Air	8.00	Nos.	9,440.00	75,520.00
		Supply / Installation / Testing & Commissioning of Ceiling Mounted Ventilation Unit Inline Type Exhaust/Fresh Air Fans & Casing for following capacity:				
205	MTA-AC-214	10000 CFM / 40mm St. Pr. With panel 3.73 KW.	1.00	Nos.	2,83,556.00	2,83,556.00
206	MTA-AC-247	800 CFM / 40 mm St. Pr. for Fourth Floor With panel 0.19 KW.	1.00	Nos.	46,284.00	46,284.00
207	MTA-AC-265	1200 CFM / 40 mm St. Pr. With panel 0.37 KW.	1.00	Nos.	52,934.00	52,934.00
208	MTA-AC-362	3000 CFM / 35 mm St. Pr. With panel 0.75 KW.	3.00	Nos.	1,04,430.00	3,13,290.00
209	MTA-AC-376	2800 CFM / 40 mm St. Pr. With panel 0.75 KW.	5.00	Nos.	1,03,096.00	5,15,480.00
210	MTA-AC-215	13000 CFM / 35 mm St. Pr. With panel 3.73 KW.	1.00	Nos.	3,46,864.00	3,46,864.00

SR.NO	REF. CODE	DESCRIPTION	QTY	UNIT	S/I/T/C RATE	S/I/T/C TOTAL AMOUNT
211	BAH-HVAC-FA-103	SITC of 6,800 CFM / 32MM ST.PR./ CSU Ceiling Suspended Cabinet Type DIDW/SISW Exhaust/Fresh Air Fans & Casing, drive, motor, mounting frame, starter, isolator & Necessary cabling & earthing strip For Following Capacities : As per AMCA210 standard "Laboratory Methods of testing fans for rating" Balancing quality - As per AMCA204 / ISO 1940 standard With VFD With Bypass Stater Panel <u>Compatibility with BMS and its accessories and cabling</u> Supplying, installing, testing and commissioning of SISW (Single inlet single width) centrifugal fan as per specification, with statically and dynamically balanced backward curved blades, galvanized steel housing, maintenance free bearings, belt driven complete with totally enclosed fan cooled squirrel cage induction motor, centrifugal fan belt drive and vibration isolators. Motor shall be suitable for 415±10% volts, 50 cycles, 3 phase AC supply & meeting criterion as perASHRAEstandard90.1-2016 and high efficiency (IS 12615) . Minimum 30 mm (W/C) external static pressure after fan outlet The cost shall be including Panel for Fans as per kw rating of motor fan with regulator/MCB requores complete with accessories.	1.00	Nos.	2,39,000.00	2,39,000.00
212	FAIR ITEM	Duty: Kitchen Exhaust - Café Capacity: 7500 CFM Static Pressure : 70 mm wg Fan Motor HP : 3.75 HP or as per requirement	1.00	Nos.	2,90,000.00	2,90,000.00
213	FAIR ITEM	Duty: Kitchen Exhaust - Dinning Capacity: 15000 CFM Static Pressure : 70 mm wg Fan Motor HP : 4.75 HP or as per requirement	1.00	Nos.	4,50,000.00	4,50,000.00
214	Fair-AMH-AC-39	SITC of Circular inline fan Battery room exhaust fan with hydrogen sensor, suitable microprocessor based controller, starter, cabling etc., The starter panel shall be compatible with BMS. Adequate number of contacts should be available for On/Off command control, On/Off status, Run status, Auto/Manual Status, Trip status monitoring through BMS. The exhaust fan shall run for 1 minute at every 1 hour interval and also when the hydrogen level in the battery room crosses 50% of LEL. The controller would be connected to a sounder outside the battery room to provide an audio alarm in case of excess hydrogen presence. Cost to include the hooter and its wiring. All cables shall be as per the site and manufacturer requirement and laid in MS conduits with suitable glands, bushes etc., provision to trip on receipt of fire alarm signal. Rate shall be for the following capacity CFM's. Quoted cost shall include BMS Compatible control & starter panel, OLP, SPP, ON/OFF push buttons with ON indications, 2nos. non polarised NO-NC contacts . MAKE :- Greenheck, Kruger, System Air, Dyna Air MAKE :- Omnicron, TechnoAir Solution, Proton (For sensor) Inline fan with 500 cfm, 20mm static pressure -Battery Room	1.00	Nos.	90,860.00	90,860.00
		Supply, Installation, Testing & Commissioning of (GSS) Vane / Tube Axial flow type fans complete with aluminium alloy blades with aerofoil design, bird screen, flexible connection & gravity louvers at outlet. Motor shall be of 415 + 10% volts, 50 Hz. Sound level at 3mt distance from fan outlet shall not be more than 80 db(A) (Room Condition). Capacity shall be as follows & as per detailed technical specification. The fans should be AMCA certified for AIR & Sound. Manufacturer shall submit Certificate of conformity for 250 deg for 2 hours operation as per EN12101-3: 2002 issued by Internationally recognized Independent Fire Laboratory and should be submitted along with type test report. The Type test report should clearly indicate the make of motor used during the testing and the same make/model of motor should be supplied by the fan manufacture at the site.The cost including the star/Delta Panel & cabling as per power rating for the Fans. Necessary copper earthing should also be included. Cabling and earthing as required from Fan Elec.Panel to Fan motor shall be considered as included in this scope & no separate measurements shall be considered for this lumpsum item. MAKE :- Greenheck, Kruger, System Air, Dyna Air				
215	Fair-AMH-AC-24	6000 CFM at 25 mm static pressure Exhaust Air Fan	16.00	Nos.	1,01,510.00	16,24,160.00
216	Fair-AMH-AC-23	5000 CFM at 40 mm static pressure Fresh Air Fan	16.00	Nos.	97,925.00	15,66,800.00

SR.NO	REF. CODE	DESCRIPTION	QTY	UNIT	S/I/T/C RATE	S/I/T/C TOTAL AMOUNT
217	FAIR ITEM	Design, supply, installation and testing of proprietary Aluminium acoustic louvers to meet MEP requirements. Detailing, supply, fabrication and installation of complete works including aluminium louver blades fitted within aluminum end plate, HDG with PU paint steel substructure, aluminium flashing and SS grade 316 anchor bolts, bolts & nuts with spring washer, SS grade 316 bird mesh. Including all accessories, and as per Subcontract Drawings, and instructions of Contractor / Engineer. Aluminium finish in high performance powder coat. Subcontractor has to do their own design calculation as per the design loads given in Subcontract Specifications and to accommodate the minimum design & performance requirements stated herein and the Subcontract Drawings Aluminium Acoustic Louvers - 12 inch Deep	220.00	Sq.mtr	43,500.00	95,70,000.00
218	Fair-AMH-AC-20	PLC Cum Sequential Controller - Supply and installation of Programmable Logic controller including timer, Aux.Relays, contactor as required with auto/manual selector switch, push button, indicating lamp, etc. The controller should automatically start & stop the Air-conditioning unit and close outlet damper as per the required schedule. Dry Contact Module for connecting External Sequential Controller with wall type Indoor units. The controller should give the sound alarm in case of failure of Air Conditioning unit accordingly include the necessary accessories. The controller shall automatically start the standby unit in case of failure of operating unit. The controller shall provide high temperature alarm in critical rooms. Provide Audible alarm with silencing switch to be installed at room entrance. PLC shall be BMS compatible & It shall be control the Sequence of 3 AC Units. (For UPS/IBMS/SERVER etc) MAKE :- Aircon Controls, Proton, TechnoAir Solution, Softhard Automation Pvt.Ltd., Selec Controls Pvt.Ltd.	8.00	Nos.	40,710.00	3,25,680.00
219	Fair-Topiwala-AC-14	Supply, installation, testing and commissioning Powder Coated Extruded Aluminium Air transfer door grilles with rear side frame as per approved shop drawings.	15.00	Sq.mtr	3,910.00	58,650.00
220	Fair-AMH-AC-08	Temperature & RH Duct/Room type sensor for signalling. MAKE :- Honeywell, Belimo, Omnicron	11.00	Nos	6,301.20	69,313.20
TOTAL AMOUNT HVAC SYSTEM (In Rs.)						18,85,81,415.00