Name of Work: Construction of building for Common Dinning Facility & food courts of 15.00 meter height including internal & external electrification, plumbing, firefighting, fire alarm System, water tanks, road, parking & HVAC at IIT Kanpur (U.P.)

PROJECT: IIT KANPUR

SCHEDULE OF QUANTITIES OF HVAC WORK FOR DINNING AREA

S. No.	Technical Description	Unit	Qty	Rate	Amount
	IMPORTANT NOTES:				
	The execution of complete work and the procurement of the material shall be done as per enclosed tender specification only.				
	The contractor shall make all shop drawings based on the drawings issued good for construction and avail approval From the consultant / Architect/ client before starting any HVAC work.				
	Payment will be made as per actual measurement at site.				
	Designing, supplying and fixing of all types of signages/ eq./ cable tags and no. plates on all Equipments would be inclusive in this scope.				
	Price shall be inclusive for unloading, shifting and installation of all items, any type of crane or scaffolding required will be in scope of vendor only.				
A	**SUB-HEAD 1.0 MAIN EQUIPMENT**				
1.00	**AIR CONDITIONING EQUIPMENTS**				
	VARIABLE REFRIGERANT VOLUME / FLOW SYSTEM				
	Supply testing and commissioning of Air-cooled inverter based modular type VRF/ VRV system using R-410A refrigerant. This should be complete with interconnecting copper refrigerant piping with insulation, copper power cabling and control wiring in PVC conduit between indoor and outdoor. Power supply to suggested ODU shall be given at one point and further distribution shall be in scope of contractor including panel and cabling. This specifications is applied for all items wherever it is required.				
1.10	**AIR HANDLING UNITS**				

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S. No.	Technical Description	Unit	Qty	Rate	Amount
	Supplying, installing, testing and commissioning of factory built, cabinet type,including mixing box, belt driven Air Handling Units (floor mounted/ ceiling suspended) with body panels Sheet thickness 0.8 mm thick for Top & Side panels & 1 mm thick for bottom panels. The sheets shall be Plain GI for inside panels & Pre-coated/painted for outer panels infilled with pressure injected free PUF of density: 40 kg/Cu.m. The thickness of the panels shall be 43 mm, heavy duty G.S.S base frame 18G single skin SS304 drain pan with 13mm thick close cell nitrile rubber insulation, fire retardant flexible canvas connection within the AHU. The air handling units shall be complete with pre-filter section MERV 8, coil section with six row deep DX cooling coil of copper tube with G.I casing & plain aluminium fin construction, fan section complete with floor standing backward curved DIDW centrifugal fan / Plug fans, EFF-3 squirrel cage induction motor, manual operated damper on return, supply & fresh air inlet / outlet, vibration isolation pads (if required). The unit shall complete with bulk head, limit switch and all complete as per specifications. AHUs shall be selected for a maximum face velocity of 500 FPM. The units shall be compatible with VRF/VRV units. The unit shall be supplied with inbuilt electronic expansion valves (Dx), AHU kit, thermostats, control wiring & all accessories as required for completing installation. Fan outlet velocity shall not exceed 1800 FPM (9.18 MPS). Price shall be inclusive for unloading, shifting and installation of all items, any type of crane or scaffolding				
1.01	**For FM AHU Ca**pacity: 12000 CFM; Motor : 10 HP Total Static pressure: 50 mm of WC .Cooling Capacity (4RD): 42 TR	Nos.	2	361,410.00	7,22,820.00
1.02	**For FM AHU Ca**pacity: 10500 CFM; Motor : 7.5 HP Total Static pressure: 50 mm of WC .Cooling Capacity (4RD): 38 TR	Nos.	2	320,238.00	6,40,476.00
1.03	**For FM AHU Ca**pacity: 10000 CFM; Motor : 7.5 HP Total Static pressure: 40 mm of WC .Cooling Capacity (4RD): 32 TR	Nos.	2	310,246.00	6,20,492.00
1.04	**For CS AHU Ca**pacity: 2500 CFM; Motor : 2.0 HP Total Static pressure: 40 mm of WC .Cooling Capacity (4RD): 6 TR	Nos.	2	132,598.00	2,65,196.00
1.05	**For CS AHU Ca**pacity: 1500 CFM; Motor : 1.5 HP Total Static pressure: 40 mm of WC .Cooling Capacity (4RD): 3 TR	Nos.	4	49,012.00	1,96,048.00
2.00	**INDOOR UNITS**				
a)	**Hi Wall Units :**				

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SCHEDULE OF QUANTITIES OF HVAC WORK FOR DINNING AREA

S. No.	Technical Description	Unit	Qty	Rate	Amount
	Supplying, Installation, Testing and Commissioning of following minimum capacity High wall type Indoor unit equipped with and comfort washable synthetic media prefilter, fan section with low noise fan/dynamically balanced blower, multispeed motor, coil section with DX copper coil, electronic expansion valve, outer cabinet, cord less remote control, drain pan, necessary accessories etc., suitable for operation on 230 V ± 10%, 50 Hz, single phase AC supply, complete as required. The Indoor units must shut down upon receiving a singal from the BMS System/Fire Singnals. The system shall be capable to adjust air flow as per room requirement automatically. The cooling capacity of indoor unit will be at air inlet conditions of 27^0 C DB and 19^0 C WB temperature. (Make will be same as of Outdoor) The cost shall include the cost of 1 meter cable and plug top from Indoor Units to 15 A/3 pins socket. Indoor unit should have capability to provide cooling/heating as per seasonal weather changes.				
i	Hi Wall Unit 1.2 TR (459 CFM)	Nos.	8	21,595.00	1,72,760.00
b)	**Ceiling Mounted Cassette :**				
	Supplying, Installation, Testing and Commissioning of following minimum capacity 4-way compact VRV/VRF Cassette Type Indoor ceiling mounted unit equipped with synthetic washable media pre-filter, fan section with low noise fan/dynamically balanced blower, multispeed motor, coil section with DX Copper coil, electronic expansion valve, outer cabinet, drain pump, grill, necessary supports, vibration Isolation, Corded remote control etc., suitable for operation on single phase 230 V ± 10%, 50Hz AC supply, complete, as required. The Indoor units must shut down upon receiving a singal from the BMS System/Fire Singnals. The system shall be capable to adjust air flow as per room requirement automatically. The cooling capacity of indoor unit will be at air inlet conditions of 27^0 C DB and 19^0 C WB temperature. (Make will be same as of Outdoor). The cost shall include the cost of 1 meter cable and plug top from Indoor Units to 15 A/3 pins socket, nits as per drawing including plug top suitable for 15 A/3 pins socket.Indoor unit should have capability to provide cooling/heating as per seasonal weather changes. Note: Capacities indicated below are actual capacity. Selection to be done considering indoor temperature @ 23^oC / 55 % Rh.				

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S. No.	Technical Description	Unit	Qty	Rate	Amount
2.01	4 way Cassette Unit 1.6 TR (530 CFM)	Nos.	4	39,950.00	1,59,800.00
2.02	4 way Cassette Unit 1.2 TR (459 CFM)	Nos.	8	39,950.00	3,19,600.00
3.00	**VRF/VRV OUTDOOR UNITS**				
	SUPPLY & INSTALLATION OF VRV SYSTEMS (Variable Refrigerant volume)				
	Supplying, Installation, Testing & Commissioning of Modular type Variable Refrigerant Flow/Variable Refrigerant Volume air cooled Outdoor units suitable for cooling/heating having 100% hermetically sealed inverter type twin Rotary/Scroll Compressor(s),minimum two compressors (with individual separate PCB) for above 14HP modules, microprocessor based Controller, top discharge type condensing unit(s), with R-410-A Refrigerant or equivalent, vibration Isolators with suitable foundation etc. complete as required. To have better efficiency condenser fan shall be capable to operate at different speed with respect to load.The unit shall deliver the rated capacity and in confirmation as per IS 18728:2024 and CPWD Specifications and work even at 50°C ambient temperature without tripping. The system shall be able to deliver 100% of the rated capacity upto 39 °C. The unit shall be suitable to work on 400V +/- 10%, 3 Phase, 50Hz AC power supply and BMS compatible. The unit shall be filled with first charge of the refrigerant and ready for use as required. The condenser should be coated with a hydrophilic film to prevent water accumulation on the surface of the heat exchanger, enhance water dispersion, and reduce the risk of degradation, thereby improving overall performance and durability. The Indian Seasonal Energy Efficiency Ratio (ISEER) of the unit shall be as per Energy Conservation and Sustainable				
3.01	20 HP Outdoor unit (₹21659.00 x 20 HP)	Nos.	4	433,180.00	17,32,720.00
3.02	18 HP Outdoor unit (₹21659.00 x 18 HP)	Nos.	7	389,862.00	27,29,034.00
3.03	16 HP Outdoor unit (₹21659.00 x 16 HP)	Nos.	7	346,544.00	24,25,808.00
3.04	8 HP Outdoor unit (₹23740.00 x 8 HP)	Nos.	4	189,920.00	7,59,680.00
4.00	**REFRIGERANT PIPING (WITH INSULATION)**				

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SCHEDULE OF QUANTITIES OF HVAC WORK FOR DINNING AREA

S. No.	Technical Description	Unit	Qty	Rate	Amount
	Supplying, Installation, testing and commissioning including vaccumiazation and Nitrogen testing of following nominal sizes of soft/hard drawn copper refrigerant piping for VRV/VRF system between each set of indoor & outdoor units, complete with fittings, with suitable adjustable ring type hanger supports, jointing/brazing including accessories, insulated with XPLE Class-O tubular insulation/with Class-O closed cell elastometric nitrile rubber tubular sleeves sections of 19 mm thick insulation as given below for Suction and Liquid lines, all accessories as per specifications etc. as required. Note: all piping inside the room shall be properly supported with MS slotted cable trays & all external piping shall run in covered cable tray.				
4.01	41.3 mm O.D.(Soft drawn) with tube thickness 1.2 mm	RM	23	1,368.00	31,464.00
4.02	34.9 mm O.D.(Soft drawn) with tube thickness 1.2 mm	RM	30	1,286.00	38,580.00
4.03	28.6 mm O.D.(Soft drawn) with tube thickness 1.2 mm	RM	71	1,157.00	82,147.00
4.04	22.2 mm O.D.(Soft drawn) with tube thickness 1.2 mm	RM	11	904.00	9,944.00
4.05	19.1 mm O.D. (Soft drawn) with tube thickness 1.2 mm	RM	111	739.00	82,029.00
4.06	15.9 mm O.D.(Soft drawn) with tube thickness 1.2 mm	RM	243	615.00	1,49,445.00
4.07	12.7 mm O.D.(Soft drawn) with tube thickness 1.2 mm	RM	258	487.00	1,25,646.00
4.08	9.5 mm O.D. (Soft drawn) with tube thickness 1.2 mm	RM	258	346.00	89,268.00
4.09	6.4 mm O.D.(Soft drawn) with tube thickness 1.2 mm	RM	106	256.00	27,136.00
5.00	**CONDENSATE DRAIN PIPING WITH U TRAPS**				
	Supplying, hanging & fixing of following items as per approved drawings, schedule and specifications. The contractor is to do the supports as per the drawing. Supports of drain pipe shall be installed using high Quality GI Slotted Channels, Saddle Nuts, Threaded Rods, Nuts, Washers, Rubber Lined Clamps etc. All piping shall be installed in a perfect straight line.				
	Drain water piping of hard uPVC (industrial grade) as required and as specified complete with bends, reducers, tees, flanges etc. as required and with 9 mm thick closed cell elastomeric. Thermal conductivity max. 0.037 W/(m*K) @ +20 Deg C shall be considered for selection of insulation material with density of 55 Kg/cub. All related works including Cutouts, Sealing of Cutouts, Connections to traps etc for completion of drain connections to Toilets, External Gully Traps, U traps etc shall be included and the same shall be done up to the satisfaction of EIC.				
5.01	25mm dia.	Mtr	36	248.00	8,928.00
5.02	32mm dia.	Mtr	55	301.00	16,555.00

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S. No.	Technical Description	Unit	Qty	Rate	Amount
5.03	40mm dia.	Mtr	50	370.00	18,500.00
6.00	**Ref. / Y-JOINTS / HEADERS**				
	Supplying, Installation, Testing and Commissioning of Y/T/Multi Joints. Joints shall be of same Original Equipment Manufacturer (OEM) make as of ODUs and IDUs (pair)	sets	19	4,535.00	86,165.00
7.00	**Remote Controller**				
	Cordless Remotes	Nos.	20	3,238.00	64,760.00
8.00	**VRV/ VRF CENTRAL CONTROLLER (I TOUCH) MANAGER**				
	Supply, installation, testing & commissioning of BMS compatible main centralised controller as per specifications to hook up indoor units as mentioned above,as well as "Spceial conditions". Controller shall howvever be sutiable for caterinjg to all the indoor and outdoor units (inculding DX/ AHUs/TFAs etc.,) for the complete project with all functions such as remote start / stop, temperature setpoint control, status monitoring etc.,	Set	1	148,933.00	1,48,933.00
9.00	**INLINE FANS CEILING SUSPENDED FAN**				
	Supplying, installing, testing & commissioning of ceiling suspended INLINE FANS suitable for installing. The unit shall be double skinned GSS casing with puff insulation / mineral wool with smooth air inlets, internally acoustically lined and constructed of galvanised steel. The fan shall be SISW / DIDW with backward / forward curve impeller centrifugal fan or centrifugal backward plug type fan fitted with maintenance free external rotor motor, flexible connections at the discharge & inlet. The motor shall be suitable for 220±10% volt single phase 50 cycles AC supply. Quoted price shall be inclusive of electronic speed regulator and wiring between fan & speed regulator for single phase fans. Incase of 3 phase fans quoted price shall be inclusive of DOL starter panel with cabling between starter panel and fan. The incoming power supply to speed regulator / starter panel shall be provided by separately.				
	The fan shall have low sound level exceeding not more than 45 DBA at three meter distance.				
9.01	1800 CFM each	Nos.	4	44,713.00	1,78,852.00
9.02	1400 CFM each	Nos.	2	31,742.00	63,484.00
9.03	1200 CFM each	Nos.	1	26,774.00	26,774.00
9.04	800 CFM each	Nos.	6	23,110.00	1,38,660.00
9.05	700 CFM each	Nos.	1	21,673.00	21,673.00

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S. No.	Technical Description	Unit	Qty	Rate	Amount
9.06	600 CFM each	Nos.	6	18,429.00	1,10,574.00
9.07	450 CFM each	Nos.	1	16,700.00	16,700.00
9.08	350 CFM each	Nos.	1	13,598.00	13,598.00
9.09	250 CFM each	Nos.	2	12,787.00	25,574.00
9.10	100 CFM each	Nos.	6	11,340.00	68,040.00
10.00	**AIR WASHER**				
	Supply, Installation, Testing & Commissioning of package type air washers of minimum 90% efficiency with 16 gauge single skin / double skin with 0.6mm outer & inner skin thickness prepainted GI sheet casing consisting of centrifugal fan, motor, mounting arrangements, metallistic vibration isolation, belt drive arrangement, VCD, distribution headers, access door, 2# pump (1W+1S), stainless steel water tank, suction screen, impregnated cellulose paper fills, HDPE filter with Aluminium frame having efficiency of 90 % down to 10 Micron, GI 'B' class piping & associated works, quick fill, makeup & drain connections with butterfly & float valves etc complete as per specifications & drawings.				
	Supplying, Installation, Testing and Commissioning of factory assembled double skin central evaporative cooling plant having air washer section with 50 mm thick pre-air filter made of washable aluminium wire mesh having 90% efficiency down to 10 microns, and a humidification ection consisting of 200 mm thick impregnated cellulose paper media (Celdek pads) along with two bend PVC eliminator and internal SS-304 casing with suitable blank-offs for the wet section. The unit shall include a fan section with belt-driven Double Inlet Double Width (DIDW) backward curved centrifugal fan, AMCA certified, with outlet velocity not exceeding 10 m/s and minimum efficiency of 70%, suitable for the required airflow at 50 mm WG static pressure. The fan shall be driven by a Totally Enclosed Fan Cooled (TEFC) IE3 class motor complete with pulley and belt arrangement. The unit casing shall be constructed with a framework of hollow extruded aluminium profiles, with outer and inner panels made of 0.80 mm thick pre-coated galvanized steel sheets, and insulated with 25 mm thick CFC-free polyurethane foam (PUF) of minimum density 40 kg/m³ sandwiched between the panels. The system shall include an SS-304 (18 SWG) sump tank, 25 mm CPVC piping, make-up water arrangement, drain and quick fill connections, butterfly/gate valves for pumps and piping, and two pumps (one working and one standby) of suitable capacity along with all necessary fittings, supports, stands and anti-vibration pads as required for complete installation. The				

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SCHEDULE OF QUANTITIES OF HVAC WORK FOR DINNING AREA

S. No.	Technical Description	Unit	Qty	Rate	Amount
10.01	21000 CFM, Static Pressure: 65 mm WG, Motor (HP): 7.5 KW	Nos.	1	216,924.00	2,16,924.00
11.00	**Exhaust Fan with electrostatic Air Scrubber**				
	Supply, Installation, Testing and commissioning of Dry Scrubber 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. The Unit shall Comprise of : a)-Backward Inclined SISW Fan complete with TEFC Induction Motor, Belt Drive Assembly, Base Frame, Motor Base, Vibration Isolators and other accessories like Belt Guard etc. Fan casing shall be of pre-platicized G.I construction made of 16 G thickness. Impeller shall be especially designed for kitchen exhaust application wherein minimum backward inclined blades to be considered to facilitate easy cleaning and should be epoxy based powder coated. Drain Plug shall also be provided. Motor shall be suitable for 415+10% volts, 50 cycles, 3 Phase AC supply. b)-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				
11.01	25000 CFM, Static Pressure: 65 mm WG, Motor (HP): 7.5 KW	Nos.	1	820,469.00	8,20,469.00
	TOTAL SUB-HEAD 1.0 MAIN EQUIPMENT				**1,34,25,256.00**
B	**SUB-HEAD 2.0 AIR DISTRIBUTION SYSTEM**				
1.00	**Ducting**				

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S. No.	Technical Description	Unit	Qty	Rate	Amount
	Supplying, installing, testing and balancing of Galvanised Steel Sheet (Completely Factory Fabricated with TDF/Slip ON Flanges) (L SECTION) seamed ducting of following thickness including necessary supports, hangers, nuts, bolts, gaskets, splitter dampers, turning vanes, canvas connections, connection pieces of rectangular to Spiral etc. complete as per technical specifications. All archs shall have baffles inside. The bidder shall quote his rates considering elbows, reducers, tees, baffles etc. The thickness of ducting shall be according to SMACNA with 120 GSM. Support/Gaskets shall be provided strictly as per the technical specifications, drawings and as per directions of Engineer in Charge. Support shall be considered at an interval of 3.0 Mtrs and on all branches. All supports should be made of galvanised steel angle with drilled holes & GI threaded rods with check nuts & washers of Hilti with support from roof of Gripple/Equivalent make. Measurement shall be made based upon effective duct area, Contractor to bid accordingly. 2.5 mm to 3 mm thick self adhesive normal gasket for Ducting as per OEM specifications to be considered.				
1.10	**Rectangular seamed galvanised steel sheet ducting (Factory Fabricated)**				
a)	24 Gauge	m^2	2660	1,191.00	31,68,060.00
b)	22 Gauge	m^2	1955	1,382.00	27,01,810.00
c)	18 Gauge	m^2	57	2,013.00	1,14,741.00
2.00	**DUCTING BUILT-IN COMPONENTS**				
2.01	**Rectangular Manually Operated Duct Dampers**				
	Supplying, installing, testing and balancing of rectangular volume control damper made of 18 G GI casing 120 mm wide and 20 G GI sheet blade 100 mm wide, chrome plated spindles, self lubricating bushes blade linkage fully enclosed, handle operation with status indicator suitable for rectangular ducting connection and complete as per drawing. (Minimum billable area shall be 0.1 sq.m)	m^2	4.5	10,373.00	46,678.50
2.02	**Toilet Exhaust Air Round Disc Valve**				
	150 mm diameter	No.	94	990.00	93,060.00
3.00	**GRILLES FOR SUPPLY/RETURN AIR.**				

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S. No.	Technical Description	Unit	Qty	Rate	Amount
	Supplying, installing, testing and balancing of aluminium powder coated, linear/ rectangular with single deflection adjustable louvers grills with fixed bar having 0 Deg, 15 Deg & 30 Deg deflection with removable core complete as per drawing. (Sample shall be approved before the execution). (Minimum billable area shall be 0.1 sq.m)				
3.01	Supply air with VCD	m^2	1.5	9,623.00	14,434.50
3.02	Return air without VCD	m^2	3	6,285.00	18,855.00
4.00	**Supply, installation, testing and balancing of square shape ceiling diffusers with removable core.**				
4.01	Supplying, Fixing, installation, testing and commissioning of supply air diffusers of powder coated aluminium with aluminium volume control dampers with anti smudge ring & removable core in confirmation to SMACNA/IS and as per specifications complete etc. as required.	Sqm.	15	12,841.00	1,92,615.00
4.02	Supplying, Fixing, installation, testing and commissioning of Return air diffusers of powder coated aluminium without volume control dampers with anti smudge ring & removable core in confirmation to SMACNA/IS and as per specifications complete etc. as required.	Sqm.	15	8,595.00	1,28,925.00
5.00	**THERMAL INSULATION**				
	Thermal insulation for GI ducting, insulation material - chemically / Physically cross linked closed cell polyethylene nitrile rubber class O with factory backed aluminium foil installed with manufacturer recommended adhesive solution. All joints of insulation should be cover with minimum 3 inch width aluminium tape.				
5.01	Supply air duct - 19 mm thick insulation (AL Foil)	m^2	2358	1,023.00	24,12,234.00
5.02	Return air duct - 13 mm thick insulation (AL Foil)	m^2	678	762.00	5,16,636.00
	TOTAL SUB-HEAD 2.0 AIR DISTRIBUTION SYSTEM				**94,08,049.00**
C	**SUB-HEAD 3.0 ELECTRICAL WORK**				`
1.00	**STARTER PANELS FOR AHUs /KITCHEN SUPPLY & EXHAUST FANS**				

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S. No.	Technical Description	Unit	Qty	Rate	Amount
	Supplying, installation, testing & commissioning of totally enclosed wall mounted starter panel panel board fabricated with 2mm thick sheet steel powder coated with seven tank treatment process including providing & fixing the following switch gears mountings there in, cable termination, interconnection as required suitable for 415 Volts, 3 phase, 4 wire, 50 Hz AC Supply as per specification including, numbering, earthing connection etc. as required.				
	One (1) No. Digital Multifunction meter with RS 485 Compatibility flush mounting suitable for measurement of Voltage, Currents, Power Factor, Frequency, Power & Energy with One set (3 Nos.) of CTs of suitable ratio Class 1.0, 15VA .				
	One set (3 nos.) phase indication lamps with control MCB.				
	One (1) No. Digital Multifunction meter with RS 485 Compatibility flush mounting suitable for measurement of Voltage, Currents, Power Factor, Frequency, Power & Energy with One set (3 Nos.) of CTs of suitable ratio Class 1.0, 15VA .				
	Suitable rating MCCB with VFD for following starter panels				
1.01	For 7.5 Kw AHU VFD	Sets	2	88,244.00	1,76,488.00
1.02	For 5.5 Kw AHU VFD	Sets	4	68,647.00	2,74,588.00
1.03	For 1.5/1.1 Kw AHU VFD	Sets	6	62,145.00	3,72,870.00
1.04	For 7.5 Kw Scrubber VFD	Sets	1	88,244.00	88,244.00
1.05	For 7.5 Kw Airwasher VFD	Sets	1	88,244.00	88,244.00
	10A MPCB for A/ W ; pump motor (1 W+1S) 0.5/.075 HP DOL starter				
2.00	**Power Cabling**				
	Providing and fixing of 1.1 KV PVC insulated, PVC sheathed, armoured cable of aluminium/copper conductor complete with double compression termination glands with PVC shrouds, identification Tags, clamps etc.				
2.01	3C X 10 Sq. mm. copper conductor armoured cable	Rmt.	100	620.00	62,000.00
2.02	3C X 4 Sq. mm. copper conductor armoured cable	Rmt.	150	462.00	69,300.00
3.00	**CABLE TRAYS along with supports**				
	Supply & installation of perforated 16G GI cable tray 50mm depth with coupler.				
3.01	50 mm wide perforated type	Rmt.	50	280.00	14,000.00
3.02	100 mm wide perforated type	Rmt.	80	522.00	41,760.00
3.03	150 mm wide perforated type	Rmt.	100	802.00	80,200.00

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S. No.	Technical Description	Unit	Qty	Rate	Amount
4.00	**Earthing**				
4.01	Supply & Installation of 25 X3 MM GI earth strip	Rmt.	150	200.00	30,000.00
4.02	Supply & Installation of 1C x 2.5 Sq.mm earthing wire	Rmt.	100	89.00	8,900.00
5.00	**ELECTRICAL WORKS FOR VRV ODU's:**				
	STARTER PANELS FOR AHUs /KITCHEN SUPPLY & EXHAUST FANS				
5.10	For single module VRV ODU's :				
	The isolator unit for single module ODU comprising 4P RCBO / 30 mA in a weather proof moulded IP 55 enclosure. The unit shall be suitable for single module VRV ODU. RCBO's rating shall be suitable for the load of ODU unit. The item shall also include 4c armoured copper conductor XLPE cable and double copper earth of required length between the isolator box and the ODU unit. (Normally upto 20 HP, ODU, its single module ODU).				
a)	8 HP (Heating/ Cooling) type	No.	4	10,199.00	40,796.00
Note:	Electrical contractor will supply power & earthing upto the isolator box input. The further cabling to VRV ODU from the isolator box shall be as part of this isolator unit item.				
5.20	**For two or multiple module units per VRV ODU:**				
	The isolator unit for two or more ODU modules comprising 4P MCCB as incomer, tinned bus bar link work, outgoings as 4P RCBO / 30mA per module of ODU. The unit shall be complete with internal wiring and enclosed in a weather proof moulded IP 55 enclosure. The outgoings shall be one 4P RCBO / 30mA for each module and shall be of adequate capacity as per the load of each module of VRV ODU. The MCCB shall be sized for the load of sum of all VRV ODU modules. The item shall include 4c armoured copper conductor XLPE cable and copper wire double earth of required length from isolator box to respective VRV ODU module. (Normally above 20HP & upto 40HP, there are two modules of ODU & from above 40 HP to 60 HP, there are three modules of ODU).				
a)	20 HP (Heating / Colling) type	No.	4	25,876.00	1,03,504.00
b)	18 HP (Heating / Colling) type	No.	7	21,563.00	1,50,941.00
c)	16 HP (Heating / Colling) type	No.	7	17,250.00	1,20,750.00
	Note: Electrical contractor will supply power & earthing upto the isolator box input. The further cabling to each VRV ODU module from the isolator box shall be as part of this isolator unit item.				

Name of Work: Construction of building for Common Dinning Facility & food courts of 15.00 meter height including internal & external electrification, plumbing, firefighting, fire alarm System, water tanks, road, parking & HVAC at IIT Kanpur (U.P.)

PROJECT: IIT KANPUR

SCHEDULE OF QUANTITIES OF HVAC WORK FOR DINNING AREA

S. No.	Technical Description	Unit	Qty	Rate	Amount
6.00	**Communication cable and conduit work:**				
6.01	Supply, laying, testing and commissioning of 2C x 1.5 sq.mm copper conductor shielded cable in existing conduit. (Communication cable)	RM	200	129.00	25,800.00
6.02	Supply, laying and fixing of conduit work including bends, junction boxes, pull wire, surface or concealed conduit work including necessary civil work such as chasing, concealing and making good and or necessary SS clamps, saddles and screws for fixing of conduit: (Conduit for communication cable).				
a)	25mm dia heavy duty FR PVC conduit	RM	100	144.00	14,400.00
	TOTAL SUB-HEAD 3.0 ELECTRICAL WORK				**17,62,785.00**
	Note: i. The Defect liablity period for the above entire VRF				
	GRAND TOTAL of S.H -1.0 , 2.0 & 3.0 (incl of GST)				**2,45,96,090.00**
	GST 18% payable				3,751,946.00
	Estimated Amount w/o GST				20,844,144.00