

PROJECT: XYZ

SCHEDULE OF QUANTITIES FOR VRV SYSTEM

The prices are to be quoted in the below mentioned form and shall include the supply, installation, testing and commissioning at site of all the equipments, ancillary materials as specified and all such items what so ever which may be required to fulfil the intent and purpose as laid down in the specification and/or the drawings.

S. Nos.	Description	Unit	Qty.	Rate (Rs.)	Amount (Rs.)		
I	SUB-HEAD-I : VRV AC/DX EQUIPMENT						
1	VRV Heat Pumps						
	Supply, Installation, testing and Commissioning of Modular Type Aircooled VRV/VRF system . The unit shall consist of Indoor and outdoor condensing unit complete in all respect. Outdoor Units shall be equipped with highly efficiency scroll compressors with 100% Inverter based technology, heat exchanger, HCFC Refrigerant cooled inverter PCB module, centrifugal fan for Condenser. Outdoor units having front suction & top discharge, with Y-branch as required, Outdoor unit shall support auto check function for connection error, auto address setting and capacity as mentioned below.						
	VRV/VRF System shall be suitable for working on local ambient temperature, with Refrigerant R-410A suitable for 415V ± 10%; 50cycles,Unit price shall be inclusive of full charge of refrigerant gas& oil, MS/GI powder coated stand with vibration isolation pads. All interconnecting piping, joints and U bends within the condensing unit shall be painted with two coats of clear transparent polymer coating for protection against corrosion from ambient air pollution before installation.						
1.1	Outdoor unit complete with scroll compressor, condenser & its controller as described below of following actual capacities. These outdoor units are dedicated for the recirculated type indoor units.						
	OUTDOOR UNITS VRF TYPE:						
	AREA	OUTDOOR UNIT RATING HP					
A	First Basement						
i	VRV AC ODU 1	20 HP	Nos.	1	415524	415524	
B	Ground Floor						
i	VRV AC ODU 2	16 HP	Nos.	1	275890	275890	
C	First Floor						
i	VRV AC ODU 3	10 HP	Nos.	1	238605	238605	
D	Second Floor						
i	VRV AC ODU 4	6 HP	Nos.	1	194815	194815	
ii	VRV AC ODU 5	26 HP	Nos.	1	475520	475520	
1.2	VRF TYPE INDOOR UNITS : (To be supplied by same manufacturer of outdoor units) Recirculation type						
	Supply,Installation,testing and commissioning of Ceiling mounted type VRF units complete with controls prefilter, fan section, DX Coil section, drain pan with drain pump & all accessories with fittings as per specification as required.						
1.2.1	AREA/VRV DUCTABLE TYPE	CFM	TR				
A	First Basement						
i	Raw Cardamom Store	2825	7.95	Nos.	2	85165	170330
B	Ground Floor						
i	Cardamom FG Area	1624	4.55	Nos.	2	80165	160330
C	Second Floor						
i	Office Area	2825	7.95	Nos.	2	85165	170330
ii	Reception Area	2047	5.50	Nos.	1	83165	83165
1.2.2	AREA/ VRV HI WALL TYPE	CFM	TR				

S. Nos.	Description		Unit	Qty.	Rate (Rs.)	Amount (Rs.)	
A	Ground Floor						
i	LT Panel Room(Electrical Room)	671	2.00	Nos.	2	25935	51870
B	First Floor						
i	FDB Panel	671	2.00	Nos.	1	25935	25935
ii	Katha Control Panel	671	2.00	Nos.	1	25935	25935
iii	Supari Control	671	2.00	Nos.	2	25935	51870
B	Second Floor						
i	Server Room	424	1.28	Nos.	1	21780	21780
ii	IT Room	424	1.28	Nos.	1	21780	21780
1.2.2	AREA/ VRV CASSETTE TYPE	CFM	TR				
C	Second Floor						
i	QC Lab	742	2.50	Nos.	2	48480	96960
2	FITTINGS & CONTROLLERS						
i	SITC of Remote controllers (Corded) for operation of indoor units.			Nos.	17	3050	51850
ii	SITC of Centralized remote controller suitable for operation & monitoring of indoor units.			Nos.	1	45698	45698
iii	SITC of fittings ;Refnet/Y joints to connect the various indoor units to outdoor unit.			Set	22	5250	115500
3	REFRIGERANT PIPING WORK						
	Supply, installation, testing and commission of interconnecting refrigerant pipe work with associated accessories/fittings as per approved shop drawings suitable for R410A refrigerant with Class O(19mm/13 mm thick) closed cell elastomeric nitrile rubber between each set of indoor & outdoor units as per specifications of following sizes as per manufacturer , properly supported with GI hangers/tray & clamps. All refrigerant piping insulation shall be covered with factory laminated glass cloth Refrigerant piping running outdoor/on terrace shall run on galvanized trays covered from top .						
	Pipe sizes shall be as follows:						
i	41.3 mm O.D - 19 mm thick insulation			RM	RO	1810	
ii	34.9 mm O.D - 19 mm thick insulation			RM	15	1425	21375
iii	28.6 mm O.D - 19 mm thick insulation			RM	78	1080	84240
iv	22.2 mm O.D - 13 mm thick insulation			RM	52	750	39000
v	19.1 mm O.D - 13 mm thick insulation			RM	35	655	22925
vi	15.9 mm O.D - 13 mm thick insulation			RM	166	610	101260
vii	12.7 mm O.D - 13 mm thick insulation			RM	54	550	29700
viii	9.5 mm O.D - 13 mm thick insulation			RM	205	460	94300
ix	6.4 mm O.D - 13 mm thick insulation			RM	8	410	3280
4.0	Condensate Drain Piping						
	Supply,installation,testing and commissioning of rigid PVC piping complete with fittings, supports as per specifications and duly insulated with 6 mm thick Class O Nitrile Rubber						
i	19 mm dia pipe			RM	224	170	38080

S. Nos.	Description	Unit	Qty.	Rate (Rs.)	Amount (Rs.)	
ii	25 mm dia pipe	RM	50	200	10000	
4	CONTROL CABLING					
i	Providing & fixing control cum transmission wiring of 2 core x 1.5 sqmm copper in suitable 25 mm dia heavy duty PVC conduits or wall chase between indoor units and outdoor units and indoor units and remote controllers.	RM	550	180	99000	
5	DX type Hi- wall split unit with ecofriendly refrigerant					
	Supply, installing, testing and commissioning of inverter type Hi-wall mounted AIR COOLED SPLIT AIR CONDITIONING UNITS . The unit shall be complete with Indoor type fan coil unit and external condensing unit with supporting frame work, rotary/scroll compressor, copper refrigerant piping with insulation and refrigerant. Quoted price shall include cost of cooling thermostat, wiring, control, wiring and earthing. Cost to also include 25 RM (distance between indoor & outdoor unit)of copper refrigerant piping and cabling. The Hi wall unit must be provided with condensate drain pump . The unit shall be complete in all respects and capacities shall be as follows :					
	AREA	TR				
A	Ground Floor					
i	Visitor Room	2.00	Nos.	1	61000	61000
ii	LT Panel (Standby Unit)	2.00	Nos.	1	61000	61000
B	First Floor					
i	FDB Panel (Standby Unit)	2.00	Nos.	1	61000	61000
ii	Katha Control Panel (Standby Unit)	2.00	Nos.	1	61000	61000
iii	Supari Control Panel (Standby Unit)	2.00	Nos.	2	61000	122000
C	Second Floor					
i	Conference Room	2.00	Nos.	2	61000	122000
ii	Meeting Room 1	2.00	Nos.	1	61000	61000
iii	Meeting Room 2	1.50	Nos.	1	55000	55000
iv	Server Room (Standby Unit)	1.50	Nos.	1	55000	55000
v	IT Room (Standby Unit)	1.50	Nos.	1	55000	55000
D	Third Floor					
i	Drier Control Panel (including one standby)	2.00	Nos.	2	61000	122000
ii	UPS Room (including one standby)	2.00	Nos.	4	61000	244000
iii	Battery Room (including one standby)	2.00	Nos.	3	61000	183000
	Sub-Total Carried To Summary				4499847	
II	SUB-HEAD- II : VENTILATION SYSTEM					
1	AXIAL FLOW FANS					
	Supply ,Installation testing and commissioning of Vane Axial Fans with impeller having adjustable pitch angle blades and complete with suitable TEFC motor and drive assembly. The fan shall be suitable for ceiling/floor installation along with spring isolators or as recommended by the manufacturer. Fan motor shall be VFD compatible & shall be of high efficiency Class EFF-1(Only for normal working fans). Motor shall be suitable for 415 ± 10% V, 3 Phase, 50 ± 3%Hz electrical supply.Fan & motor shall be selected for minimum 40mm Static pressure.Total static pressure shall be checked by vendor. Change in static pressure will not attract any price implication. The complete fan assembly alongwith the motor & drive assembly shall be fire rated i.e. suitable to operate upto 250°C for 2 hours and meet the duty parameters.The fan shall be selected for low noise level and low RPM as per technical specifications. Fans shall be AMCA Certified. Price shall also include double sleeve fire retardant flexible connection on both sides of the fan.The fan duty shall be as follows:					
	AREA	FAN CFM	MOTOR KW			

S. Nos.	Description	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
1.1	2nd Basement				
i	Parking Area - Normal & Fire Mode FA & Ex 5000	Nos.	8	70560	564480
ii	AC Area - Normal & Fire Mode FA & Ex 5000	Nos.	4	70560	282240
ii	Pump Room - Normal Mode FA & Ex 2500	Nos.	2	55760	111520
iii	Store Room- Normal Mode FA & Ex 1500	Nos.	2	42195	84390
1.2	1st Basement				
i	Parking Area - Normal & Fire Mode Ex 5500	Nos.	4	83152	332608
ii	AC Area - Normal & Fire Mode FA & Ex 5000	Nos.	4	70560	282240
iii	STP/ETP Plant Room - Normal Mode Ex 2500	Nos.	1	55760	55760
iv	STP/ETP Plant Room - Normal Mode FA 2000	Nos.	1	55760	55760
1.3	PRESSURIZATION FANS - Fire Mode (Terrace level)				
i	Staircase pressurization fans 20000	Nos.	2	150540	301080
ii	Lift Well Pressurization fans 10500	Nos.	2	105450	210900
2	INLINE FANS				
	Supply, installation, testing and commissioning of duct mounted Cabinet/Circular Inline fans complete with direct driven centrifugal blower/impeller, motor, rubber isolation mounts & other accessories including wiring & conduiting complete in all respects. The inline fans shall be selected for lower noise level. Single phase Inline fans motor shall have inbuilt speed controller & three phase inline fan motor shall be compatible with VFD and shall be provided with suitable starter ,power/control cabling and earthing.NC level 3M away from source should be less than 60db.The fans shall be of following capacity:				
i	200 CFM (Toilet areas)	Nos.	2	12985	25970
ii	300 CFM (Toilet areas)	Nos.	2	13524	27048
ii	3000 CFM (FF Dining Area FA & Ex)	Nos.	2	34650	69300
3	PROPELLER FANS				
	Supply, installation, testing and commissioning of propeller exhaust fans of various capacities as given below suitable for 240 volts, 50 Hz, single phase AC supply complete with gravity louvers & speed regulator etc.				
i	Shrink Wrapping 1 & 2 - 2000 CFM	Nos.	4	11500	46000
ii	LT Panel Room(Electrical Room) - 2000 CFM	Nos.	1	11500	11500
iii	Lockers - 1000 CFM	Nos.	2	8500	17000
iv	Battery Room - 2500 CFM	Nos.	1	13500	13500
	Sub-Total Carried To Summary				2491296
III	SUB-HEAD-III : AIR DISTRIBUTION WORK				
1	Rectangular GI Ducting (Factory Made)				

S. Nos.	Description	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
	Supply, fabrication, Installation, testing and commissioning of factory fabricated rectangular/round/elliptical ducts using G.I Sheets (120GSM coating). The price shall include factory fabricated TDF flanges, turning vanes, splitter dampers, supports (factory fabricated, full threaded GI rod/hangers & G.I slotted channel), sealant, neoprene gasket, access door etc. The joints shall be with least leak and shall be tested with pressure testing machine.				
i	24 gauge galvanized sheet steel	Sqm	481	815	392015
ii	22 gauge galvanized sheet steel	Sqm	733	985	722005
iii	20 gauge galvanized sheet steel	Sqm	163	1125	183375
iv	18 gauge galvanized sheet steel	Sqm	8	1215	9720
2	Site Fabricated GI Duct				
	Supply, fabrication, Installation, testing and commissioning of site fabricated rectangular ducts using G.I Sheets (120GSM coating). The price shall include factory fabricated MS flanges (wherever required), turning vanes, splitter dampers, supports (factory fabricated, full threaded G.I rod/hangers & G.I slotted channel), sealant, neoprene gasket, access door etc.as required and as per ISI specifications.The joints shall be with least leak and shall be tested with pressure testing machine.				
i	24 gauge galvanized sheet steel	Sqm	54	785	42390
ii	22 gauge galvanized sheet steel	Sqm	82	935	76670
iii	20 gauge galvanized sheet steel	Sqm	19	1095	-
iv	18 gauge galvanized sheet steel	Sqm	3	1165	3495
3	VOLUME CONTROL DAMPER				
	Supply, installation, testing and balancing of opposed multiblade box type GI volume control damper within ducts to be provided with suitable links, levers and quadrants for manual control of volume of air flow and for proper balancing of the air distribution system as per approved shop drawings & specifications.	Sqm	1	4550.0	4550
4	Fire Dampers & Actuator				
	Supplying, Fixing,testing and commissioning of fire dampers in supply air duct/main branch and return air path as and where required of required sizes i/c control wiring,the damper shall be motorized and spring return so as to close the damper in the event of power failure automatically and open the same in case of power being restored. The spring return action shall be inbuilt mechanism and not externally mounted. The damper shall also be closed in the event of fire signal complete as required and as per specifications.				
i	Fire Damper	Sqm	7	7000	49000
ii	Actuator	Nos	14	8200	114800
5	DIFFUSERS WITH VCD				
	Providing and fixing of aluminium extruded powder coated supply/return diffusers with VCD as per specifications and drawings including fixing frame in false ceiling/walls as per specification and drawings.(Colour approval from Arch.)				
i	Supply/Return Diffuser	Sqm	17	9450	160650
6	GRILLES WITH VCD				

S. Nos.	Description	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
	Providing and fixing of aluminium extruded powder coated supply/return grilles with VCD as per specifications and drawings including fixing frame in false ceiling/walls as per specification and drawings.(Colour approval from Arch.)				
i	Supply/Return Grilles	Sqm	21	6850.0	143850
7	AIR TRANSFER GRILLS				
	Supply,installation,testing and balancing of extruded aluminium construction duly powder coated non vision air transfer grilles with two side frame to be provided in doors.	Sqm	3	4950	14850
8	FRESH AIR/EXHAUST AIR LOUVERS				
	Supply, installation, testing & balancing of Fresh air/Exhaust air Extruded Aluminium/GI louvers with bird screen and opposed blade box type GI volume control damper complete as per specification & approved shop drawings.Construction/profile of the louvers shall give a protection against the rain and suitable for fixing in the external facade of the building.				
i	G.I Louvers	Sqm	16	7000	112000
ii	Aluminium Louvers	Sqm	4	7650	30600
9	FLEXIBLE CONNECTION (CANVAS)				
	Supply,installation and testing of double layer flexible duct connector consisting of a flame retardant fabric secured to extruded aluminium frame on both sides to provide a wear resistant airtight flexible connection. Fabric shall be mildew resistant, water proof and silicon impregnated.Flexible connector shall be supplied in accordance with the specifications and drawings.	Nos	52	1950	101400
Note:	Samples of grilles / diffusers will have to be submitted to the Architect for approval on size / shape / shade / colour before ordering.				
	Sub-Total Carried To Summary				2161370
IV	SUB-HEAD-IV-THERMAL INSULATION				
1	Thermal Insulation				
	Supply & installation of external thermal insulation on ducts with approved sample of blue/green colour factory laminated fibre glass cloth of 7 mil on closed cell nitrile rubber/ 60 micron Aluminium foil faced Nitrile Rubber duct insulation with density 40-60 Kg/ Cum & class 'O' complete as per specifications. All longitudinal and transverse joints shall be sealed with 50mm wide and 3mm thick Nitrile rubber .The cost shall be inclusive of Low VOC adhesive..				
i	13mm thick (60 micron Alu facing)	Sqm	241	580	139780
ii	19mm thick	Sqm	RO	655	-
2	Duct Acoustic Lining				
	Supply and fixing of acoustic lining of supply air duct with 15 mm thick Open Cell Nitrile Rubber of density 140-180 kg per metre cube as per specifications. Nitrile Rubber shall have anti microbial protections against microbes and tested for air erosion at 10000 fpm.				
i	15 mm thick	Sqm	70	1350	94500
	Sub-Total Carried To Summary				234280
V	SUB-HEAD-V : ELECTRICAL WORK				
	Preamble to BOQ for MCC , Distribution Boards & wall mounted Starter Panels				

S. Nos.	Description	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
	General Notes & Specifications as given below shall be applicable to all panels. The vendors shall consider the following details in their item rates, wherever required:				
1	Supporting rigid steel framework.				
2	Cubicle type, 14 gauge CRCA sheet steel enclosure.				
3	Panel Complete with interconnections and distribution bus bars.				
4	Proper bonding to earth.				
5	Painting/lettering on Breakers and distribution boards, the location they serve, Providing on each panel its circuit diagram.				
6	Providing cable clamps / supports within distribution boards cable alley.				
7	TPN MCCBs shall mean 3 pole MCCBs with adequate size of neutral link.				
8	All MCBs shall be of minimum 10 KA breaking capacity.				
9	All motor feeders MCCBs shall be of motor duty.				
10	Distribution panels shall be Powder Coated with Siemens gray paint shade Nos. RAL-7032 of IS-5.				
11	Degree of protection for following type of distribution panel enclosure shall be as per IS:13947-1993.				
12	IP 52 for indoor panels.				
13	IP 55 for outdoor panels with double door enclosure.				
14	All MCCB's shall be provided with operating mechanism for door interlock.				
15	Current density of aluminium shall be 1 sq mm for 1.0 amps for rated current of bus bars and current density of copper shall be 1 sq.mm for 1.25 amps for rated current of bus bars.				
16	Tinned copper earth bus shall be provided through out the length of each board.				
17	All measuring instruments (Meters) shall be of digital electronic with LED of approved make and compatible with BAS.				
18	All indicating lamps shall be LED type.				
19	All current/voltage transformers shall be cast resin type.				
20	All hinged door shall be earthed through 2.5 sq mm tinned braided copper wire.				
21	All panels shall have provision of the following:				
i	Pad locking of Switch board doors.				
ii	Pad locking of MCCB's handles in "OFF" Position.				
iii	Additional set of C.T.s, potential free contacts, connectors, contactors with wiring etc are to be provided for BAS including space required for various transducers in Main Switch Board sections. Only transducers shall be supplied by BAS contractor.				
22	All MCB's used for protection of resistive and lightly inductive load shall be type "B" characteristic and inductive (motor) load shall be of type "C" characteristic and discharge lamps and UPS etc. shall be of type D characteristic.				
23	All incoming and outgoing air circuit breakers shall be placed on middle portion of the vertical in single tier formation.				
24	All PTs / control transformers shall be provided with centre tap earth secondary.				
25	All DOL & Star-Delta Starters shall be provided with voltage based SPPR (single phase preventor relay) and 2 nos. of Aux.Contacts for Remote operation/monitor.				
26	The Panel fabricator shall provide Aluminium Bus-bars link from Breakers wherever more than two nos. of cables are terminated in the breakers.				
27	Readymade 16SWG Sheet steel Enclosure with cutout For MCBs				
28	The breaking capacity of MCCB's shall be mentioned panel wise. All MCCB's shall be with thermal magnetic releases upto 250 amps and microprocessor based above 250 amps capacity, unless specified otherwise.				
29	All internal control wiring shall be heat resistant type.				
30	Bus bar chamber shall be provided at top only. Incoming and outgoing cable entry shall be from top/bottom as required.				
31	Live parts shall not be accessible after opening the door, Transparent acrylic sheet to be provided to cover the same.				

S. Nos.	Description	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
32	Spare contacts of ACBs / MCCBs / Relay / Contactor shall be wired upto terminal block.				
33	All Switchgear used in Starter Circuit shall be type-2 coordinated. Contactor rating shall be selected as per the kVAR rating of the capacitor bank from capacitor duty contactor range. Vendor to furnish the type-2 coordination chart and capacitor duty contactor selection chart.				
34	Protection Releases Microprocessor based (PRMB) & Thermal magnetic (PRTM) shall be as described below .				
1	Isolator Switches With Metal Enclosure				
i	2.5A 3 pole isolator switch for equipments with sheet metal enclosure, rain protection etc. as required to suit the site condition. (Enclosure shall be suitable for out door installation.)	Nos.	2	2340	4680
ii	6A 3 pole isolator switch for equipments with sheet metal enclosure, rain protection etc. as required to suit the site condition. (Enclosure shall be suitable for out door installation.)	Nos.	4	2340	9360
iii	10A 3 pole isolator switch for equipments with sheet metal enclosure, rain protection etc. as required to suit the site condition. (Enclosure shall be suitable for out door installation.)	Nos.	20	2340	46800
iv	18A 3 pole isolator switch for equipments with sheet metal enclosure, rain protection etc. as required to suit the site condition. (Enclosure shall be suitable for out door installation.)	Nos.	2	2340	4680
v	24A 3 pole isolator switch for equipments with sheet metal enclosure, rain protection etc. as required to suit the site condition. (Enclosure shall be suitable for out door installation.)	Nos.	2	2340	4680
2	CONTROL/TRANSMISSION CABLING				
	Providing & fixing control cum transmission wiring of 3 core x 1.5 sqmm copper in suitable 25 mm dia heavy duty PVC conduits or wall chase .	RMT	1000	160	160000
	Sub-Total Carried To Summary				230200