

PRICE BID			
SCHEDULE OF QUANTITIES FOR FOR HVAC WORKS FOR STATE BANK OF INDIA, OPERA HOUSE BRANCH, OPERA HOUSE, MUMBAI			
SR. NO.	DESCRIPTION OF WORKS	QTY	UNIT
A	<b>VRF / VRV SYSTEM (Makes : Mitsubishi Elec.,Daikin,Train, Toshiba,Mitsubishi Heavy hitachi )</b>		
<b>1.0</b>	<b>Supply of Out Door Units suitable for VRF / VRV System</b>		
	Supply of Modulating outdoor units, with multi scroll compressors (minimum two compressors per condensing unit) with inverter type compressor, special pre-coated fins, panel, corrosion resistant (suitable for seaside installation) coated condenser, inverter based condenser fan , Vibration isolation pads, electrical & microprocessor panel, isolating valves and all the necessary accessories for proper functioning of the units, including VRF Ref net Joints etc. having following approximate capacities.		
	All the compressors of the outdoor units must be 100% DC inverter hermetically sealed scroll type. Each module of outdoor unit must have combination of only Inverter Compressor, suitable to operate at heat load proportional to indoor unit requirement.		
	The outdoor unit shall employ system of equal run time for all the compressors, within each outdoor unit – Single Module or Multi Module.		
	The outdoor units shall be suitable to operate within an ambient temperature range of – 5 Deg C to 53 Deg C, in cooling mood		
	The total HP is indicated in the BOQ. The bidder shall quote for the maximum capacity module that fullfills the total HP capacity as duly asked-for in the BOQ		
	The quoted rate shall include Supply, Transportation, Loading, Unloading, Lifting Shifting, Placing in positioning at site of the units, M.S. Stand for outdoor units including caging arrangement, M.S sections of appropriate loads carrying capacity (Design to be furnished for approval) with M.S sections duly painted with coats of epoxy paint, pressure testing, vaccumizing, Gas charging (Including supply of Gas), incoming cable termination, all assessories, gadgets etc forming a part of the Supply & Installation requirements for outdoor units		
	Note : Fins and copper tubes of Air Cooled Condenser alongwith copper tubing / piping with all joints and U-Bends exposed to coastal areas corrosive atmosphere / aggressive ambient, shall be painted with special corrosion prevention coating		
	Outdoor units suitable for following capacities:		
1.1	24 HP VRF ODU	1	no
1.2	18HP VRF ODU	1	no
	<b>Above outdoor unit capacity is selected based on our design calaculations. However, suitable outdoor unit to be selected as per VRF manufacturer standard &amp; to quote accordingly</b>		
	The indoor unit shall be suitable for a power supply of 240V/ 1 phase/ 50Hz OR 415V / 3 phase / 50Hz.		
<b>2.0</b>	<b>Supply of VRF Ceiling Cassette Type 4- way Indoor units , indoor unit shall be complete with wired controller. Unit size (3feetsx3feets)</b>		
	Supply of 4-way Cassette type indoor units each complete with decorative panel, 220 volt, 1 phase, 50 Hz, AC supply of the following capacities including in-built drain pump, Cordless remotes for all the Indoor units etc complete. The rate shall include all assessories, fittings, fixtures, standard assessories, including VRF Ref net Joints and remote controllers manufacturers specifications & codal standards, Supply, Transportation, Loading, Unloading, Lifting Shifting, Placing in positioning at site of the units etc complete as per directions & instructions of Architect		
2.1	3 TR	7	Nos.
2.2	2 Tr	3	Nos.
2.3	1.5 Tr	3	Nos.
2.4	1 Tr	4	Nos.

SR. NO.	DESCRIPTION OF WORKS	QTY	UNIT
<b>3.0</b>	<b>VRF wall mounted decorative Indoor units , indoor unit shall be complete with wireless controller</b>		
	Supply of high-wall Split AC Unit of the following capacities including R410A green gas indoor unit with in-built Electronic Expansion Valve, cordless remote, 2-way drainage connection etc complete. The rate shall include all assessories, fittings, fixtures, standard assessories including remote controller, manufacturers specifications & codal standards etc complete as per directions & instructions of Architect.		
3.1	1 Tr	2	Nos.
<b>4.0</b>	<b>Additional VRF Ref net Joints</b>		
	Please note that Refnet at Outdoor will not be considered as part of measurement and rate quoted shall take into account the same.		
	Vendor is expected to minimise number of joints that is required for complete installation.		
4.1	Multi Kits / Ref Joints	10	Nos.
<b>5.0</b>	<b>Additional Remote Controllers for VRF units</b>		
	Supply of Wireless Remote controllers for all type of Hi-Wall Units / Cassette units etc { 1 for every 1 unit } as mentioned hereinabove the BOQ)		
5.1	Wireless remote controllers	1	Nos.
<b>6.0</b>	<b>Central Remote Controller analog type</b> with Technical Specifications suitable for automatic operation of all indoor and outdoor units.	1	Set
<b>7.0</b>	<b>Inline centrifugal fans with necessary supports, canvas connections and other accessory.</b>		
	Inline ceiling suspended Ex fans		
7.1	1000 cfm 10 mm static for Exh air , pantry and toilets	1	Nos
<b>8</b>	Supply of stand alone type cooled wall mounted DX units, complete with 3 star wall mounted indoor unit, condensing unit, remote controller. Condensing unit fins shall be of Copper and shall be coated for corrosion resistance		
8.1	2 Tr	5	Nos
<b>9</b>	SITC of Drain pumps for all units as mentioned in this BOQ	1	Nos
	<b>TOTAL FOR 'A' - VRF / VRV SYSTEM</b>		

SR. NO.	DESCRIPTION OF WORKS	QTY	UNIT
	<b>Installation of VRF/ VRV system</b>		
<b>B</b>	<b>VRV / VRF SYSTEM</b>		
<b>1.0</b>	Installation, Testing and Commissioning of Out Door Units suitable for VRF / VRV System & -Price shall inclusive of Refrigerent charge ,lifting shifting of all vrf units, Anti corrosive coating on condensing coil and fins , and other nessesary accessories Pressure Testing, Nitrogen flushing, gas charging (R410A), testing & commissioning of the air-conditioning system.		
	Rate shall include Green gas with scroll Compressor. The units should be complete with indoor unit, condensing unit, Controls, control panel, control wiring between indoor and outdoor unit, saddling of power cabling in between the outdoor units and the isolator/ MCB & all necessary Electrical cabling, assessories etc complete,VRF Ref net Joints, insulated refrigerant piping, drain piping. The wiring and insulated refrigerant piping should be based on the distance between indoor unit and condensing unit within minimum as 20 M. The insulated drain piping to be hard PVC 25/32/40/50 mm dia including supports and canvas connection at unit outlet. Machines shall be supported with help of vibration isolators. The rate should include 20 Rmts of refrigerant and also the drain piping including necessary insulation for discharge, suction line and drain line & cabling based on power being provided within 1M of the indoor unit. Rate shall include installation, testing & commissioning (Except the Supply component) of all assessories, fittings, fixtures, gadgets forming part / scope of Supply as duly mentioned hereinabove the BOQ including standard assessories as per manufacturers specifications		
	Note: The control panel shall have incoming power MCCBS/MCB as per split unit control panel requirement		
	All the AC unit control panels location will be as approved by Consultant/ Architect		
	The units shall be connected to a common fire panel and machine should switch off, in case of a fire. Provision to have potential free contact to get signal from BMS in case of fire so that AC can get shut off. It should be possible to start and stop the unit from remote locations Outdoor units should be installed as per the site condition & should be fabricated as approved by CLIENT/Architect/Consultant		
	Installation, Testing and commissioning of Outdoor units of the VRF system / DX Units as supplied above		
1.1	24 HP VRF ODU	1	no
1.2	18 HP VRF ODU	1	no
<b>2.0</b>	Lifting Shifting, Erection, Installation, Testing and Commissioning of <b>Indoor Units</b> suitable for VRF / VRV System. Costs shall include hanging / mounting arrangements for the respective IDUs and shall also include for wall mounting of remote controllers near respective units. the rate should include VRF Ref net Joints.		
	<b>Installation of VRF Cassette Indoor units ,</b>		
2.1	3 TR	7	Nos.
2.2	2 Tr	3	Nos.
2.3	1.5 Tr	3	Nos.
2.4	1 Tr	4	Nos.
<b>3.0</b>	<b>Installation, Testing and Commissioning of VRF wall mounted decorative Indoor units. The rate should include the remote controller and the VRF Ref net Joints.</b>		
3.1	1 Tr	2	Nos.
<b>4.0</b>	<b>Installation, Testing and Commissioning of inline fans, with supports stnd , pin top, cavas connection and power cable and required all other accessories.</b>	1	Nos.

SR. NO.	DESCRIPTION OF WORKS	QTY	UNIT
5.0	Installation, Testing and Commissioning of stand alone wall mounted decorative Indoor & outdoor units with fabricated stand to keep ODU also price shall be inclusive of other related accessories.		
5.1	2 Tr	5	Nos.
6.0	Supply and intallation of MS Structure for intallting Condensing unit stan.Condensing units stand should be Fabricated uing MS C Channnel frame Size 75X40X5mm. Support shall be taken from nearby RCC floor/slab/ Column. M Minimum 16 Hilti Bolt should be used to secure the MS stand with building. Two coat of red oxide and one coat of black paint to be applied on the structure. Detailed drawing of MS Structure , fixing arrangment should be submitted for approval of consultant, architect and client.	150	Kg
7.0	<b>Power &amp; Control cabling:</b>		
	Supply, Installation, Testing & Commissioning of Outdoor to Indoor Electrical Cabling. The Electrical works shall be as per general & manufacturers standards, specifications & as per directions of the Architect after thorough design & detailing in the form of shop drawings. Electrical contractor shall terminate power in individual switch socket for each IDU as per requirement. For VRF ODU incoming power shall be provided at the PDB, from there to each VRF ODU the cabling shall be carried out by HVAC contractor.		
7.1	Power and Control cabling with copper conductor cable with end termination for Indoor units with Plug Top, Earthing connection, etc. with FRST PVC conduit	30	RMT
8.0	<b>Refrigerant piping</b>		
	SITC of all refrigerant piping between indoor & outdoor units shall be of 16G thickness only. All refrigerant piping to be insulated with minimum 19 mm thick class "O" armafex nitrile rubber with UV protection and covered with Al. foil as per specifications. All piping shall be installed on GI Perforated cable tray & Pipe line must be tested for requisite pressure & must be supported as per specification.		
8.1	Hard Pipe with insulation – 19 mm thick	150	RMT
8.2	Soft Pipe with insulation – 19 mm thick	100	RMT
9.0	Supply, Installation, Testing & Commissioning of Drain Piping in Hard PVC with all fittings, supports and clamps upto size of 50 / 40 / 32 / 25 mm dia as per general & manufacturers standards, specifications & as per directions of the Architect after thorough design & detailing in the form of shop drawings including drilling holes in wall, chipping wall etc to conceal and to route the drain pipe, maintaining adequate slope to the pipes etc complete. The piping shall be suitably insulated with 19 mm thk Closed Cell foam Class O (Nitrile Rubber) stuck with approved adhesive compound. The insulation shall be covered with glass cloth and painted with rubberised paint to the complete satisfaction of the Architect.		
	Dia 32 mm	100	RMT
	Dia 40 mm	50	RMT
	Dia 50 mm	50	RMT

SR. NO.	DESCRIPTION OF WORKS	QTY	UNIT
<b>10</b>	<b>AIR DISTRIBUTION:</b>		
<b>13.1</b>	<b>SHEET METAL DUCTING - FACTORY FABRICATED</b>		
	Rectangular / Circular Ducting in <b>Galvanised Steel</b>		
	Supply, Fabrication, Installation, Testing & Commissioning of following gauges of Galvanised Iron ( GI ) Sheet complete with splitters, supports, dampers, and turning vanes. (Approved Makes: Jindal, SAIL, TATA, Equivalent) 180 GSM sheet. GI duct fabrication shall follow SMACNA Standards. Duct shall be painted in black colour ( expose part which to be seen )		
a	0.63 mm (24 SWG) GSS ducting	25	Sq.M.
13.2	Flexible round duct		
	Dia 100 mm	10	mtr
<b>14.0</b>	<b>ACCESSORIES</b>		
<b>14.1</b>	<b>Butterfly Volume Control Dampers</b>		
	Supply, installation and adjusting of GSS Volume Control Damper complete with Manual quadrant control with position indicator to be provided to enable adjust volume of air as required.in 18 G complete as per specifications. ( 100 mm dia) for fresh air Duct	10	Nos
	Volume control dampers	1	Sq.M.
<b>15.0</b>	<b>GRILLES</b>		
	Supply, fabrication, assembling and installation of linear aluminium powder coated grilles as indicated in the drawings and as per specifications.		
	(color to match as per architects requirements)		
	100/150 mm wide	2	Sq.M.
<b>17.0</b>	<b>Double Canvass Connection</b>		
	Supply, fabrication & installation of double canvass (fire retardant) flexible connection as per drawings & specifications.	1	SETS
<b>20.0</b>	<b>UNDERDECK INSULATION</b>		
	Supply, fabrication and laying of under deck thermal insulation with suitable thickness & of approved make as specified and shown on the drawing complete with:	355	Sq.M.
	a) 19 mm Closed Cell Foam Insulation - minimum density Class O, 60 kg/cu.m density with minimum R Value 4.1/inch with Water vapour permeability shall not exceed 0.017 Perm inch (2.48 x 10 <sup>-14</sup> Kg/m.s.Pa), i.e. Moisture Diffusion Resistance Factor 'μ' value should be minimum 7000.		
	The insulation shall meet the Class 'O' Fire category.		
	b) Recommended / Proprietary synthetic adhesive bonding.		

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21.0	Providing & Executing, Finishing of all the necessary Civil works required for the successful supply, installation & commissioning of the AC system which shall include but not limited to False ceiling works, POP punning & POP works, Painting works of any or all types, Carpentry works including making necessary openings, holes, core cutting works required incase of making openings in RCC elements of any size, shape, at any location etc as per directions of the Architects, Patch repairs to the brick walls, erection of new brick-work, internal &/or external cement based plastering of any mix, composition as per directions and including painting as mentioned above, chiseling on the walls, miscellaneous civil & interior works of any / all types, making openings in partitions & wall paneling elements by providing & fixing matching laminates / veneers as duly existing including polishing of any type as per directions	1	Lumsum
	<b>TOTAL FOR B' Installation Work</b>		

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<b><u>SUMMARY STATEMENT</u></b>			
<b>A</b>	<b>HIGH SIDE (SUPPLY ITEMS)</b>	<b>Rs.</b>	
<b>B</b>	<b>LOW SIDE (INSTALLATION ITEMS)</b>	<b>Rs.</b>	
<b>C</b>	<b>TOTA OF HVAC WORKS - (A) + (B)</b>	<b>Rs.</b>	
<b>D</b>	ADD: GST @ 28% OF (A)	Rs.	
<b>E</b>	ADD: GST @ 18% OF (B)	Rs.	
<b>GRAND TOTAL (C+D+E)</b>		<b>Rs.</b>	
<b>SIGN &amp; SEAL OF THE CONTRACTOR</b>			