

**PRICE BID FOR AIR CONDITIONING (HVAC) WORK - EXISTING PREMISES AT LG-03-04, MOULSARI AVE DLF PHASE -3, SECTOR 24, GURUGRAM HARYANA - 122022**

**SCHEDULE OF QUANTITIES**

**GENERAL NOTES:**

<b>1</b>	All items of work under this Contract shall be executed strictly to fulfill the requirements laid down under "Basis of Design" in the specifications. Type of equipment, material specification, methods of installation and testing and type of control shall be in accordance with the specifications, approved shop drawings and the relevant Indian Standards, however capacity of each component and their quantities shall be such as to fulfill the above mentioned requirement.
<b>2</b>	The unit rate for all equipments or materials shall include cost in <b>RUPEES</b> for equipment and materials including all taxes and duties, including forwarding, freight, insurance and transport into Contractor's store at site, storage, installation, testing, balancing, commissioning and other works as required.
<b>3</b>	The rate for each item of work included in the Schedule of Quantities shall, unless expressly stated otherwise, include cost of :
<b>a.</b>	All materials, fixing materials, accessories, appliances tools, plants, equipment, transport, labour and incidentals required in preparation for and in the full and entire execution, testing, balancing, commissioning and completion of work called for in the item and as per Specifications and Drawings.
<b>b.</b>	Wastage on materials and labour.
<b>c.</b>	Loading, transporting, unloading, handling/double handling, hoisting to all levels, setting, fitting and fixing in position, protecting, disposal of debris and all other labour necessary in and for the full and entire execution and for the job in accordance with the contract documents, good practice and recognize principles.
<b>d.</b>	Liabilities, obligations and risks arising out of Conditions of Contract.
<b>e.</b>	All requirements of Specifications, whether such requirements are mentioned in the item or not. The Specifications and Drawings where available, are to be read as complimentary to and part of the Schedule of Quantities and any work called for in one shall be taken as required for all.
<b>f.</b>	In the event of conflict between Schedule of Quantities and other documents including the Specifications, the most stringent shall apply. The interpretation of the Consultant/Project Manager shall be final and binding.
<b>4</b>	All equipments, quantities and technical data indicated in this Schedule are for the Contractor's guidance only, these are based on the documents prepared by the Consultant. This schedule must be read in conjunction with other documents. The Contractor shall be paid for the actual quantity of work executed by him in accordance with the approved Shop Drawings at the contract
<b>5</b>	This Schedule shall be fully priced and the extensions and totals duly checked. The rates for all items shall be filled in INK including NIL items.
<b>6</b>	No alteration whatsoever is to be made to the text or quantities of this Schedule unless such alteration is authorised in writing by Consultant. Any such alterations, notes or additions shall, unless authorized in writing, be disregarded when tender documents are considered
<b>7</b>	In the event of an error occurring in the amount of the Schedule, as a result of wrong extension of the unit rate and quantity, the unit rate quoted by the tenderer shall be regarded as firm and the extensions shall be amended on the basis of rates.
<b>8</b>	Any error in totaling in the amount column and in carrying forward total shall be corrected. Any error, in description or in quantity, omission of items from this Schedule shall not vitiate this Contract but shall be corrected and deemed to be variation required by the Consultant/Project Manager.
<b>9</b>	Rates have been called for a number of items of works, as alternatives which, for the present do not form part of the total value of tender. However the rates for these items shall be quoted, with due care so that in the event of choice of an alternative item of work, said rate shall form part of the contract and shall not violate the contract any way.
<b>10</b>	The Contractor shall procure and bring Materials/Equipment to the site only on the basis of drawings approved for construction and shop drawings and not on the basis of Schedule of Quantities which are provisional only. This also applies to the Contractor's requisition for Owner supplied materials.
<b>11</b>	Minimum gauge for duct fabrication shall be 24 gauge wether it is site fabricated or factory fabricated.
<b>12</b>	<b>Electrical for HVAC</b>
	All the starters of HVAC equipments shall have BMS compatibility.
	In specific, each starter shall have-
	AUTO/MANUAL switch/status
	Accept start/stop command from BMS
	PFC to BMS for run status & trip status.
	PFC to BMS for Auto/Manual.

## BOQ FOR HVAC WORKS

S. Nos.	Description	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
i	<b>SUB-HEAD-I : EQUIPMENT</b>				
	<b>VRV/VRF System (Suitable for Cooling &amp; Heating)</b>				
1	<p>SITC of Complete VRV/VRV/VRF system with Comprising of Indoor &amp; Outdoor units complete with insulated copper refrigerant piping, cabling electrical switchgear, drain piping, testing &amp; CFC free gas charging .Scroll compressors shall be hermetically sealed Inverter driven type, with electronic controls capable of loading &amp; unloading approx. between 10% capacity to 100% capacity of the unit, condenser coils with anti corrosive blue fins, axial flow fans, microprocessor based controller, etc. shall be fully weather proof , factory assembled &amp; prewired with all accessories &amp; electronics &amp; refrigerant controls housed in a powdercoated MS sheet metal housing of the following actual capacity Outdoor units shall be capable to operate at Ambient Condition.The Units Shall be capable to provide cooling/Heating as per requirement. The Units Should be as per detailed technical specification &amp; drawings.</p> <p>Note: HVAC Contractor is advised to verify the proposed ODU capacity (as mentioned below &amp; in the equipment schedule attached in the tender)as per Ambient Condition specified above &amp; consider the deration of piping length as required .Any increase or decrease in the capacity of ODUs should be done at the time of Tendering i.e.before finalization of order .Vendor should submit their Engineering guidelines as a supporting documents for the same.</p>				
	<b>Notes:</b>				
1	The Vendor should recheck the proposed selection of indoor/outdoor units based on the make of units offered by them to match the required CFM & TR with required calculated capacity as per details below supported by the Manufacturer printed technical data sheet.				
2	The Vendor should verify & calculate the size & length of refrigerant piping & cabling as per the drgs & give their offer based on the same.This being a Works Contract including all applicable taxes the refrigerant piping cabling & drain piping is included in scope of supply & installation. Please refer VRV /VRV/VRF ODU location layout.				
3	Rates should include lifting shifting to installing level of machines and indoor units should include Y-joints, headers and cordless remote controls for operation of indoor units,2 Core shielded communication wire in conduit between outdoor to indoor unit.				
4	Commissioning of VRV/VRF system shall also include top up gas charges and shall not be paid later as additional item.				
5	Ducted type Indoor units should be provided with fire retardant double flexible connection between fan outlet & ducts.				
6	All the ODUs to be kept on Structural Platform with Vibration Isolators to avoid the transfer of Vibrations directly on Slab.				
7	All indoor & outdoor units shall be quoted with Hydrophilic coating for protection from corrosive element in the surroundings.				
8	The bidder should review the drawings & visit the site before quoting to check the feasibility of their Indoor & Outdoor units in terms of Installation, Performance & future maintenance & select their Model accordingly.				
9	Successful Bidder to provide Condensate drain for all Indoor Units upto the nearest floor drain. This should be of heavy gauge UPVC duly insulated with 9 mm thick Nitrile. The common vertical drain pipe in shafts(If Required) should be of minimum 40 mm dia.				
10	The VRV/VRF Vendors should check the tender drawings & confirm (while quoting) the suitability of location of the Indoor & Outdoor Units for their optimum performance.				
11	In case of Multiple Modules of ODUs, Vendor shall provide the Electrical Distribution Box consisting of suitable size Isolators for each Module. Single point supply shall be provided to the Distribution Box. Further cabling/wiring from DB to the ODU modules shall be in the scope of Vendor.				
12	Exposed copper pipe of the ODU should be coated with 2 coats of chemical resistant coating (AC gaurd CP or equivalent)to protect against corrosion & erosion . Coil fins should be coated with solvent based Fine polymer coating (coil shield Plus				

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13	VRV/VRF systems should be BMS and fire alarm compatible .				
14	HVAC contractor should provide the units with provision of auto sequencing for equal run time.				
15	VRV/VRF units with Scroll Compressor Capable of Modulating Capacity,i.e. it should be able to vary speed of the compressor as per the varying load conditions and works on R410A/R407A with Heating/ Cooling both.The outdoor unit should be Factory assembled unit Housed in a sturdy weather proof casing constructed from rust proof mild screen panels powder coated finish.The outdoor units must have multiple scroll Compressors for 14HP and above modules.The Outdoor unit must have Refrigerant cooled Inverter PCB to ensure smooth operation in high Temperatures. Outdoor Unit must having COP of 5.0 or more at 50% Load and 35 deg outside ambient Conditions.All the units shall be provided with built in microprocessor control panel for automatic operation and capacity control. All compressor shall have inverter based technology.The manufacturer of compressor and ODU shall be same.				
16	VRV/VRF TYPE UNITS: (Tailor made units shall be procured from other vendors duly approved by the manufacturer of the VRV units)				
	<b>VRV Cooling and heating mode type</b>				
1.1	Outdoor units shall have cooling & heating mode, consisting of one/multiple modules with digital vapour injection/inverter scroll technology based compressor and environment friendly refrigerant R-410A/R407A. The unit should have COP as per ASHRAE 90.1 (Latest standard) . The C.O.P confirmation should be from the O.E.M letter, for the following capacities.The cost shall include the cost of Cabling from MCB/ELCB/isolator to the outdoor unit. (Cable Length to be as per drawing).Isolator cost shall also include.The unit shall be provided with its own microprocessor control panel with provision for integration with the building management system for Air-conditioning system.The units shall be suitable for 415V±10%,50 Hz. supply & complete with electrical controls & panels. Cost of Cowl with Birdscreen (If Required) for Top Discharge outdoor unit shall also include ,requirement of cowl to be verified by the HVAC Vendor as per drawing /site conditions &cost of MS stand for ODUs should also considered. External vibration pad shall also be provided during installation. Below Outdoor units are Top Discharge,However HVAC Vendor is suggested to verify their performance. Anti-Corrosive treatment on the complete refrigerant piping and on the Outdoor units fins should be provided.				
	<b>OUTDOOR UNITS VRV/VRF TYPE:</b>				
	<b>AREA</b>	<b>OUTDOOR UNIT RATING HP</b>			
1.1.1	<b>Area</b>				
i	ODU (For all areas)	10	No.	1	
1.2	<b>VRV/VRF TYPE INDOOR UNITS : (To be supplied by same manufacturer of outdoor units) Recirculation type</b>				
	Supply, installation, Testing & Commissioning of Indoor units equipped with pre-filter, fan section with low noise fan, multispeed motor, coil section with DX coil, electronic expansion valve, outer cabinet, drain pan with drain pump kit, insulation, pipe connections etc. of various capacities including supporting arrangement with suitable vibration isolator as per specifications and drawings.The cost shall include the cost of power & control cabling & earthing from ODUs to Indoor Units 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.				
	<b>Ceiling suspended ductable typeType</b>	<b>CFM</b>	<b>TR</b>		

S. Nos.	Description	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
i	BANKING HALL,CASH COUNTER,CHIEF MANAGER 1624 4.60	Nos.	2		
<b>1.3</b>	<b>FITTINGS &amp; CONTROLLERS</b>				
i	SITC of Wired Remote Controller for Indoor Units with suitable wiring (1.0 sqmm x 2C) in PVC conduit	Nos.	2		
ii	SITC of fittings, Refnet/Y joints to connect the various indoor units to outdoor unit.	Set	1		
<b>1.4</b>	<b>REFRIGERANT PIPING WORK</b>				
	SITC of interconnecting following sizes of hard/ soft drawn seamless refrigerant copper pipe work as per Air Conditioning norms with Y-Joints/Refnets (Considered in separate item & will be paid under that relevant item) & silver soldering joints as required at site & as per specifications insulated with "O" class closed cell electrometric nitrile rubber tubular insulation of fire retardant grade of conductivity less than 0.22 Btu.in/(h.ft <sup>2</sup> °F) and density 50kg/CMT with thickness 13mm up to 25mm dia pipe and with 19mm for more than 25mm dia pipe between indoor units & Outdoor units as per specifications. All piping inside the building shall be properly supported with Trays and all External piping shall be supported with covered type Tray (Tray Quantified separately for the same). The Refrigerant pipe sizes & thickness shall be as per manufacturer's standard. It should be complete as per technical specifications. Piping should be on cable tray with nitrile rubber class"O" insulation and all pipes should have outside Lac coating of 7MIL and inside Lac coating of MIL.				
	<b>Pipe sizes shall be as follows:</b>				
i	22.2 mm O.D - 13 mm thick insulation	RM	10		
ii	15.9 mm O.D - 13 mm thick insulation	RM	30		
iii	9.5 mm O.D - 13 mm thick insulation	RM	20		
<b>1.5</b>	<b>CONTROL CABLING</b>				
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 wired remote controllers.	RM	75		
<b>1.60</b>	<b>Condensate Drain Piping</b>				
	Providing and Fixing UPVC6kg/cm <sup>2</sup> pipes of various sizes with 6mm nitrile insulation for condensed water drainage from indoor unit to nearest disposal point in Toilet/Outside rain water harvesting system as per specification				
a)	25 mm dia pipe	RM	25		
	<b>Sub-Total</b>			<b>RS.</b>	
<b>II</b>	<b>SUB-HEAD-III : AIR DISTRIBUTION WORK FOR VENTILATION</b>				
<b>1</b>	<b>Rectangular GI Ducting (Factory Made)</b>				
	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.				
a)	24 gauge galvanized sheet steel ( TDF 01- 750mm)	Sqm	20		
b)	22 gauge galvanized sheet steel ( TDF 751 - 1500mm)	Sqm	10		
c)	20 gauge galvanized sheet steel ( TDF 1501- 2250mm)	Sqm	R.O.		
d)	18 gauge galvanized sheet steel ( TDF 2250mm & above )	Sqm	R.O.		

S. Nos.	Description	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
<b>2</b>	<b>GSS VOLUME CONTROL DAMPER</b>				
	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.(All AHUs, fan sections VCD at machine outlets shall be included in the equipment cost only)	Sqm	1		
<b>3</b>	<b>SUPPLY GRILL</b>				
	Supply, installation, testing & balancing of removable core type , linear, fixed bar extruded aluminium powder coated Supply Air / Return Air / Exhaust Air grills, normal flow, 15° angle one way / two way deflection with all sides flanges.Blade thickness shall be minimum 5mm in front and 1.0 mm in rear side.Grills shall be supplied in accordance with specifications and approved shop drawings.				
a.	200 mm/150mm/100mm High	Sqm	1		
<b>4</b>	<b>EXHAUST/RETURN GRILL</b>				
	Supply, installation, testing & balancing of removable core type , linear, fixed bar extruded aluminium powder coated Supply Air / Return Air / Exhaust Air grills, normal flow, 15° angle one way / two way deflection with all sides flanges.Blade thickness shall be minimum 5mm in front and 1.0 mm in rear side.Grills shall be supplied in accordance with specifications and approved shop drawings.				
a.	200 mm/150mm/100mm High	Sqm	2		
<b>5</b>	<b>VCDs FOR LINEAR GRILL SUPPLY AIR COLLARS</b>				
	Supply, installation, testing & balancing of key operated extruded Aluminium volume control dampers in black mat finish for supply/return/exhaust air duct collars as per approved shop drawings and specifications.	Sqm	0.5		
<b>6</b>	<b>FRESH AIR INTAKE LOUVERS</b>				
	Supply, installation, testing & balancing of Fresh air Extruded Aluminium intake 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.	Sqm	0.5		
<b>7</b>	<b>SUPPLY/ RETURN AIR DIFFUSERS</b>				
	Supply, installation, testing and balancing of square, rectangular and round extruded aluminium powder coated Supply/ Return Air diffusers. Diffuser shall be with spring loaded removable core type distribution grid , key operated aluminium black matt finish dampers .Diffusers shall be supplied in accordance with specifications and approved shop drawings.	Sqm	4		
<b>8</b>	<b>BIRD SCREEN</b>				
	Supply, installation, testing & balancing of factory made Bird screen made out of galvanized steel mesh in 20G having diamond pattern with GSS flanges and necessary cross bracings suitable for Fresh/ Exhaust air fans on terrace, complete as per specification & approved shop drawings.	Sqm	1.2		
<b>Note:</b>	<b>Samples of grilles / diffusers will have to be submitted to the Architect for approval on size / shape / shade / colour before ordering.</b>				
	<b>Sub-Total</b>			<b>RS.</b>	
<b>III</b>	<b>SUB-HEAD-IV-THERMAL INSULATION</b>				
<b>1</b>	<b>Thermal Insulation(Internal ducting):</b>				

S. Nos.	Description	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
	Supplying and fixing of following thickness duly laminated aluminum foil of mat finish closed cell Nitrile rubber (Class "O") insulation on existing duct after applying suitable adhesive for Nitrile rubber. The joints shall be sealed with 50 mm wide and 3 mm thick self adhesive nitrile rubber tape insulation complete as per specifications and as required.				
<b>a</b>	<b>13mm thick</b> (Supply air Ducts in return air path)	Sqm	18		
<b>2</b>	<b>Acoustic lining (For Ducts)</b>				
	Supply & Installation of acoustic lining within supply and return air ducting using <b>open cell</b> elastomeric insulation Class I with with 140-160 Kg/cum. density.All ducts shown cross hatched on the approved shop drawings shall be provided with acoustic lining as per the specifications.The cost shall be inclusive of low VOC adhesive.				
<b>a</b>	15 mm thick	Sqm	5		
<b>b</b>	25 mm thick	Sqm	R.O.		
	<b>Sub-Total</b>			<b>RS.</b>	
<b>IV</b>	<b>SUB-HEAD-V-REMOVING &amp; REFIXING</b>				
<b>1</b>	Reinstallation, testing & Commissioning of existing/ provided by the Bank high wall split Acs (Indoor, outdoor) Including Refrigerant gas filling, Servicing, cleaning etc, voltage stabilizer if present, & Timer as per drg. or as directed by the engineer incharge				
<b>1.1</b>	<b>Split AC 1.0 TR. ( System UPS Room)</b>	Nos.	2		
<b>2</b>	Supplying and laying of Extra copper refrigerant piping with nitrile rubber pipe insulation, both of size as specified by the manufacturer suitable for 1.0TR Split type AC including Electrical interconnecting control cable (From Indoor to outdoor Units)				
<b>1.1</b>	<b>Split AC 1.0 TR. ( System UPS Room)</b>	RM	16.00		
	<b>Sub-Total</b>			<b>RS.</b>	
<b>V</b>	<b>SUB-HEAD-VI : COMMISSIONING &amp; HANDING OVER OF THE SYSTEM</b>				
	Submission of Commissioning document (in 3 hard and soft copies) duly approved by client's operation team and Project Manager. Minimum documents required are Equipment commissioning reports, water balancing reports, Air balancing report and room temperature monitoring data (Every 6 hours for 3 days), Particle count test reports for OT's, Indoor air quality report.				
<b>a</b>	Current drawn by equipment & overload trip test report.				
<b>b</b>	Air balancing & air flow measurements shall be done by Digital Hood & velocity matrix only.				
<b>c</b>	Overpressure verification for staircases and lift wells				
<b>e</b>	Fire damper operation				
<b>d</b>	System static pressure measurement for AHUs, Ventilation fans digital pitot tubes only.				

S. Nos.	Description	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
e	Measurement of Power Consumption and efficiency verification.				
f	As built drawing submitted to client and Consultants/architect.				
g	Indoor air quality testing.	Job	1		
	<b>Sub-Total</b>				RS.
	<b>HVAC WORKS TOTAL = (A)</b>				RS.
VI	<b><u>SALVAGE ITEMS AIR CONDITIONING</u></b>				
	<b>SALVAGE:- Dismantling and removal of all existing Control wires, cable, conduits, Grills, Diffuser, Ducts, Machines etc. including making the area free from all debris and complete site clearance to receive new works all complete as per the instructions of Bank's Engineer/ Architect</b>				
(i)	Control Wirings etc.	Lot	1.00		
(ii)	DIFFUSERS	Lot	1.00		
(iii)	GRILLS	Lot	1.00		
(iv)	OLD MACHINES	Nos.	2.00		
	<b>SALVAGE / BUY BACK ITEMS TOTAL = (B)</b>				RS.
	<b>SUB TOTAL HVAC WORKS AFTER LESS SALVAGE ITEMS (A-B) = 'C'</b>				RS.
<b>Note:-</b> The rates quoted includes all other taxes , duties , loading, unloading , transportation, other expenses etc to site <b>only GST will be paid Extra.</b>					