SCHEDULE OF QUANTITIES

GENERAL NOTES :

1 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.

2 The rate for each item of work included in the Schedule of Quantities shall, unless expressly stated otherwise, include cost of :

a. 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. Wastage on materials and labour.

c. 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.

d. Liabilities, obligations and risks arising out of Conditions of Contract.

e. 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.

f. In the event of conflict between Schedule of Quantities and other documents including the Specifications, the most stringent shall apply. The interpretation of the Engineer shall be final and binding.

3 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 Services 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 rates.

4 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.

5 No alteration whatsoever is to be made to the text or quantities of this Schedule unless such alteration is authorised in writing by Services Consultant. Any such alterations, notes or additions shall, unless authorized in writing, be disregarded when tender documents are considered.

6 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.

7 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 Services Consultant/Project Manager.

8 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 approximate only. This also applies to the Contractor's requisition for Owner supplied materials.

9 The unit rate for all local equipment or materials in Indian Rupees shall include cost of equipment and materials including all taxes and duties and also including forwarding, freight, insurance and transport into Contractor's store at site, storage, installation, testing, balancing, commissioning and other works required.

Item	Description	Unit	Qty	Rate	Amount
A.	**EQUIPMENT**				
1	Supply Installation, testing and commissioning of Modulating outdoor units, with multi scroll compressors (minimum two compressors) with both variable speed type compressor, special pre-coated fins, panel, corrosion resistant coated condenser, inverter based condenser fan M.S. hot dip galvanised stands / supports, electrical & microprocessor panel, isolating valves and all the necessary accessories for proper functioning of the units, having following approximate capacities. The cost is Inclusive of Channel MS painted Channel Support on existing PCC foundation. (Heating and Cooling Type)				
	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 either in factory or at site.				
	ODU shall have Bacnet output over TCP/IP for 3rd party integration (Optional).				
1.1	32 HP (Ground Floor Office Area)	Nos.	1	6,75,580	6,75,580
1.2	16 HP (GF Assembly hall NEW Line)	Nos.	1	3,33,744	3,33,744
1.3	16 HP (GF dynamo Area)	Nos.	1	3,33,744	3,33,744
1.4	10 HP (Mezz Training hall)	Nos.	1	2,30,452	2,30,452
1.4	34 HP (FF R&D Deptt and Café Block)	Nos.	1	7,08,424	7,08,424
2	Supplying, installing, testing and commissioning of double skin 40 mm thick panels construction consisting of G.I casing of thickness 0.6 mm outside layer and 0.6 mm inside layer with zinc coating and polyurethene foam(PUF) insulation having density of 42 kg/m3 , construction draw thru type AIR HANDLING UNITS each complete with , pre-filter section (90% down to 10 microns),Aluminium supporting structure, Min 6 Row deep for Ceiling Mounted AHU with DX Coil and aluminium fins construction and electrical , squirrel cage induction motor, centrifugal (backward Curve/aerofoil/Plug) fan as to give maximum efficiency for specified duty condition belt drive and vibration isolators. DX Coil size shall be selected for a minimum face velocity of 500 ft/min and External static shall be as indicated. The motor selected shall be energy efficient having premium efficiency IE3 at full load ranging between 82.5 % to 97 % in accordance with motor rating as per specification. Motor shall be suitable for 415±10% volts, 50 cycles, 3 phase AC supply. Fan motor assembly (as whole) shall be statically and dynamically balanced to grade G 6.3 as per ISO-1940/AMCA 204-3.All units shall be complete with opposed blade volume control dampers at oulet, return at Top and fresh air connections with Damper . Duct flexible connector (fire proof) shall be provided at outlets and return connection of AHU.				
	AHU Tag / Space Fed / CFM / TR / Static in mmWG / Heater				
2.1	AHU- 01 Office Area 3600 9 50	Nos.	1	2,26,800	2,26,800
2.2	AHU- 02 Office Area 3600 9 50	Nos.	1	2,26,800	2,26,800
2.3	AHU- 03 Office Area 3100 8 50	Nos.	1	2,16,800	2,16,800
2.4	AHU- 04 Dynamo Area 5100 12 50	Nos.	1	2,91,900	2,91,900
2.5	AHU- 05 Assembly Hall 5100 12 50 6KW	Nos.	1	3,08,900	3,08,900
2.6	AHU- 06 Training Hall 3000 7 50	Nos.	1	2,05,500	2,05,500
2.7	AHU- 07,08,09 R& D and Café 4000 10 50	Nos.	3	2,51,300	7,53,900
	The AHU Shall be with Front Discharge , Ducted Return Connection (Side Top) and Fresh air Connection with Damper.				
	Note : AHU tag No 07 , 08 ,09 Ducted Connection is not required.				
	AHU Tag no 5 Shall be with Strip Heater and controller and Humidistat Sensor etc.				
2a	Supply and installation of Refrigerant AHU Expansion Kit for Connection AHU Dx coil and VRV Outdoor Unit.				
2a.1	AHU-01 KIT	Nos.	1	28,665	28,665
2a.2	AHU-02 Kit	Nos.	1	28,665	28,665
2a.3	AHU-03 - Kit	Nos.	1	28,665	28,665
2a.4	AHU-04 - Kit	Nos.	1	28,665	28,665
2a.5	AHU-05 - Kit	Nos.	1	28,665	28,665
2a.6	AHU-06 - Kit	Nos.	1	28,665	28,665
2a.6	AHU-07 , 08 , 09 - Kit	Nos.	3	28,665	85,995
	CENTRAL REMOTE CONTROLLER :				
3	Supply, Installation, Testing and Commissioning of **Remotes, conduiting & wall chasing charges shall be included**.				-
	Central Remote Control (Push Button Type)	Nos	1	4,450	4,450
					-
	IMPORTED 'Y' JOINTS				-
4	Supply, Installation, Testing & Commissioning of Y-joints & Refnet joint etc .	LOT	1	5,560	5,560
					-
5	**COPPER PIPE**				-
	Supply, installation, testing & commissioning **refrigerant liquid line and suction line (duly insulated) piping** with nitrile foam insulation of 13mm up to 25mm & 19mm for above size with Fibre Cloth and UV Coating on Top of It to entire length.				-
5.1	6.4 mm	Rmt.			-
5.2	9.5 mm	Rmt.	43	536	23,048
5.3	12.7 mm	Rmt.	100	677	67,700
5.4	15.2 mm	Rmt.			-
5.5	15.9 mm	Rmt.	40	809	32,360
5.6	19.1 mm	Rmt.	10	957	9,570
5.7	22.2 mm	Rmt.	50	1,081	54,050
5.8	28.6 mm	Rmt.	110	1,357	1,49,270
5.9	34.9 mm	Rmt.	50	1,609	80,450
					-
	TRANSMISSION CABLE				-
6	Supply, installation, testing & commissioning of **transmission cabling** between indoor AHU Kit & outdoor unit in FRLS PVC Conduit				-
6.1	2 C * 1.5 sq.mm Cable	Rmt	650	180	1,17,000
					-
	POWER CABLE				-
7	Supply of Electrical Power cable between the AHU Kit and power socket with unshielded copper cable, with 1 no. plug top for each IDU. Cost shall be inclusive of FRLS PVC Conduit.				-
	3 Core, 2.5 sqmm Cable	Rmt.			-
	Note : Plug Top will provided				-
	DRAIN PIPING				-
8	SITC of Rigid PVC piping as per IS complete with fittings, supports and duly insulated with 6 mm thick closed cell nitrile rubber insulation, wall chasing , floor chase & filling and connection to Plumbing Trap , charges shall be included .				-
8.1	20mm	Rmt.	100	180	18,000
8.2	25mm	Rmt.	50	225	11,250
8.3	32mm	Rmt.	120	288	34,560
8.4	40mm	Rmt.	20	360	7,200
8.5	50mm	Rmt.			-
					-
9.00	Supply and fixing of perforated type GI cable trays with GI treaded and Slotted rail support including accessories like Tee , Reducer , Cross etc of the following sizes as per specification. The Tray Shall be suppoorted on GI angle Support at Terrace				-

Item	Description	Unit	Qty	Rate	Amount
	For Refrigerent Pipes				-
9.1	600 mm x 50 x 50 x 2 mm thick (Tray to be covered at Terrace)	RM	30	2,790	83,700
					-
9.2	300 mm x 50 x 50 x 2 mm thick	RM	100	1,395	1,39,500
					-
9.3	150 mm x 50 x 50 x 2 mm thick	RM	10	490	4,900
					-
	Note: Copper piping shall be run in covered tray on terrace.Vendor to include the cost of same				-
					-
10	Supply, installation, testing and commissioning of duct mounted **IN-LINE FANS** for exhaust / fresh air as shown in drawings. Each fan shall be complete with motor, mounting flanges, accessories like bird screen, fixed louvers and GI sheet canopy for weather protection as required. Fan shall be selected for 20 mmWG static pressure. Quoted price shall be ~~inclusive of DOL starter in case of 3 Ph fans, electronic speed regulator and wiring between fan and speed regulator~~. The Cost shall be inclusive of backdraft damper at Discharge				-
	Fan Selection arrangement shall be as follows:				-
10.1	250 CFM	No.			-
10.2	300 CFM	No.	1	5,130	5,130
10.3	350 CFM	No.	1	5,950	5,950
10.4	650 CFM	No.	2	11,050	22,100
10.5	1000 CFM	No.	1	17,480	17,480
11	Supplying, installing, testing and commissioning of AIR HANDLING UNITS (FAN SECTIONS ONLY) with double skin construction as per specifications, each complete with squirrel cage induction motor (mounted internally), SISW Backward curved centrifugal fan belt drive and vibrations isolators.Motor shall be Outside Mounted and IE3 Motors shall be suitable for 415 +- 10% volts, 50 cycles , 3 phase AC supply an static pressure shall be as indicated . Fan-motor assembly (as whole) shall be statically & dynamically balanced to grade G6.3 as per ISO-1940/AMCA 204-3. All AHUS (Fan sections) shall be suitable for outdoor duty and complete with duct connections . The Unit shall be with Thermal Threak Profile and Ducted Return Connection . The Unit shall be complete with IP 65 Control Panel, PID Temperature Controller for Stepless Heater Bank .				-
11.1	2000CFM (40mm st. pr) fan section with Heater of 20 KW	No.	1	80,000	80,000
	Note : Temperature Required in Burn in Room Shall be 55 deg C				-
12	Supplying, installing, testing and commissioning of direct driven **PROPELLER FANS** for exhaust air as shown in drawings. Each fan shall be complete with permanent split capacitor or shaded pole motor, mounting plate, accessories like wire guard, bird screen and fixed louvers for weather protection as required. Fan selection arrangement and Electrical characteristics shall be as follows :				-
					-
12.1	1000 CFM , Low RPM 900 RPM fan suitable for 230±10% volts 50 cycles, 1phase AC supply.	Nos.			-
12.2	2500 CFM , Low RPM 900 RPM fan suitable for 230±10% volts 50 cycles, 1phase AC supply.	Nos.			-
12.3	500 CFM , Low RPM 900 RPM fan suitable for 230±10% volts 50 cycles, 1phase AC supply.	Nos.	2	25,000	50,000
12.4	350 CFM , Low RPM 900 RPM fan suitable for 230±10% volts 50 cycles, 1phase AC supply.	Nos.	2	17,500	35,000
					-
13	Dismantling and Shifting of Existing Split AC and Installation of Same at Required Location Complete with Copper Piping , Drain Connection and Power / Control Cabling . The Cost is Inclusive of Gas Charging and Testing Complete required for Sussesfull Installation.				
13.1	1.0 TR	Nos.	2	14,420	28,840
13.2	1.5 TR	Nos.	13	14,420	1,87,460
13.3	2.0 TR	Nos.	10	14,420	1,44,200
14	Supply ,installation and Testing of Copper Pipe (liquid and Gas) with Nitrile Insulation , Fibre wrap , UPVC Drain Piping with Insulation and Power & Communication Cable Cables etc				
14.1	1.0 TR	RMT	5	4,250	21,250
14.2	1.5 TR	RMT	40	4,250	1,70,000
14.3	2.0 TR	RMT	40	4,250	1,70,000
	TOTAL CARRIED TO SUMMARY				**65,50,507**

Item	Description	Unit	Qty	Rate	Amount
B.	**AIR DISTRIBUTION**				
1	Supply, installation and testing of Factory fabricated GI sheet metal ducts as per SMACNA in accordance with the approved shop drawings and as required by the specifications. The duct Support shall be Gi Slotted rail with treaded rod or GI Wire rope Support.				
	Gauge **Duct size** **Joint Type**				
a	26 gauge galvanised sheet steel (Duct Size upto 750 mm - C&SS Type), (Duct Size 751-1000mm - TDC Type)	Sqm.			-
b	24 gauge galvanised sheet steel (Duct Size 1001-1500mm - TDC Type)	Sqm.			-
c.	20 gauge galvanised sheet steel (Duct Size 1801-2100mm - TDC Type)	Sqm.			-
2	Supply, installation and testing of Site fabricated GI sheet metal ducts as per BIS standard in accordance with the approved shop drawings and as required by the specifications.				
2.1	26 gauge galvanised sheet steel (Duct Size Less Than 450mm -)	Sqm.	130	950	1,23,500
2.2	24 gauge galvanised sheet steel (Duct Size 451 - 750mm)	Sqm.	310	1,050	3,25,500
2.3	22 gauge galvanised sheet steel (Duct Size 751 - 1500mm)	Sqm.	310	1,150	3,56,500
3	Supply, fabrication, Installation, testing and commissioning of factory fabricated "Round /Spiral " rigid construction GSS sheet metal ducts powder coated in accordance with the approved shop drawings and confirming to BIS standards, complete as per manufacturer's standard accessories. The Duct Shall be Internally Insulated with 9 mm thk Nitrile Insulation and External face Shall be Painted with colour shall be approved by architect / client. Vendor to Considered GI Wire Rope Support or equivalent etc.				
	Gauge **Duct size** **Joint Type**				
3.1	24 gauge galvanised sheet steel (Duct Size 600mm dia)	Sqm.	80	1150	92,000
3.2	22 gauge galvanised sheet steel (Duct Size 651-950mm)	Sqm.			-
3.3	20 gauge galvanised sheet steel (Duct Size 951-1250mm)	Sqm.			-
3a	Supply, installation and testing of Factory fabricated GI Elliptical sheet metal ducts with 9 mm thk Nitrile Insulation as per SMACNA in accordance with the approved shop drawings and as required by the specifications. The Duct shall be Painted with two coat of Enamel Paint of approved colour				
	Gauge **Duct size** **Joint Type**				
3a.1	24 gauge galvanised sheet steel (Duct Size 600 mm) - Duct Fitting 20 Guage	Sqm.			-
3a.2	22 gauge galvanised sheet steel (Duct Size 625 -900 mm) Duct Fitting 20 Guage	Sqm.			-
3a.3	22 gauge galvanised sheet steel (Duct Size 925 -1200mm)-Duct Fitting 18 Guage	Sqm.			-
					-
4	Supply, fabrication, installation and testing the **flexible connections** constructed of fire resistant double resin sleeve at Ductable and Inline Fans as per the approved shop drawings.	Nos	12	3,150	37,800
					-
					-
5	Supply, Installation, Testing and Balancing of Powder coated extruded aluminium construction **Supply and Return air Grilles** as per approved drawings and specifications.	Sqm.	8.0	5,965	47,720
					-
6	Supply, installation, testing and commissioning of Powder Coated Collar Damper in Supply Air	Sqm	5.0	9,560	47,800
					-
7	Supplying & fixing of non return air GI **volume control dampers in 16G** in supply air ducts as per approved drawings and specifications.	Sqm.		8,560	-
					-
8	Supply, installation, testing and balancing of Powder coated/Anodised extruded aluminium construction **louvers with bird screen** for exhaust air as per specifications and approved drawings.	Sqm.	5.0	8,584	42,920
					-
9	Supply, installation & testing of Non-Insulated flexible Duct with spigot connections of following size as per specification and approved drawing.				-
9.1	100 mm dia	Rm	30	1,240	37,200
					-
9.2	125 mm dia	Rm			-
					-
10	Supply, installation, testing and balancing of Powder Coated Extruded Aluminium **Toilet Grill (150 X 150)** complete with air pattern controllers	No.	28	950	26,600
11	Supply, installation, testing and balancing of supply air and return air grilles in accordance with the approved shop drawings and specifications for Parking, Mechanical and Back of the house areas.	Sqm.			-
12	Supply, installation, testing and commissioning Powder Coated Extruded Aluminium Air transfer door grilles with rear side frame as per approved shop drawings.	Sqm.	0.6	5965	3,579
					-
					-
13	Supply, installation, testing and balancing of Powder coated extruded aluminium construction. Circular shape supply /return air diffusers with removable core, antismudge ring as per specifications.	Nos			-
13.1	600 mm dia Difffuser with Damper	Nos	19	2,250	42,750
13.2	600 mm dia Difffuser without Damper	Nos	11	1,640	18,040
14	Supply, installation, testing and balancing of Powder coated extruded aluminium construction. Square shape supply /return air diffusers with removable core, antismudge ring as per specifications.				-
14.1	600 mm dia Difffuser with Damper	Nos	29	2,250	65,250
14.2	600 mm dia Difffuser without Damper	Nos	24	1,640	39,360
					-
15	Supplying & fixing of back draft dampers or Non Return Damper in supply air ducts as per approved drawings and specifications.	Sqm	2	5,965	11,930
	TOTAL CARRIED TO SUMMARY				13,18,449

Item	Description	Unit	Qty	Rate	Amount
C.	**THERMAL INSULATION**				
1	Supply, installation and testing of acoustic lining with in supply and return air ducts as per the specifications. •The density of acoustic insulation material shall be within 140-180 Kg/m3. The acoustic insulation material shall have a thermal conductivity not exceeding 0.047 W/(m.K) @ 20 Deg. C as per EN 12667. The acoustic insulation material shall withstand maximum surface temperature of +85 Deg.C and minimum surface temperature of -20 Deg.C as per EN 14706. The material shall conform to Class 1 rating for surface spread of Flame in accordance to BS 476 Part 7 & UL 94 (HB, V-0) in accordance to UL 94, 1996. All ducts shown cross hatched on the approved shop drawings shall be provided with acoustic lining as per the specifications.				
1.1	15 mm thick open Cell Nitrile acoustic lining (Anti Microbial)	Sqm	50	485	24,250
1.2	25 mm thick acoustic lining. (At ATP)	Sqm.			-
2	Supply and installation of Internal Thermal insulation material shall be Closed Cell Elastomeric Nitrile Rubber with anti microbial properties on ducts as per the approved specifications. Insulation material shall be self adhesive sheets, Density of insulation material shall be between 40 to 55Kg/m3.The Aluminium foil shall be of 12 micron thickness with reinforced glass scrim and weight shall be 70 gsm as per EN 22286, tensile strength shall be 250N/50mm as per ISO 527-3 with elongation of 4% as per DIN 53354. Quoted price shall be inclusive of adhesive, tapes as per specification .				
2.1	9 mm thick Closed Cell Elastomeric Nitrile Rubber (with AL foil OR WITH fibre cloth on one side) insulation for supply & return air ducts.	Sqm			-
2.2	13 mm thick Closed Cell Elastomeric Nitrile Rubber (with AL foil OR WITH fibre cloth on one side) insulation for supply & return air ducts.	Sqm	750	544	4,08,000
	TOTAL CARRIED TO SUMMARY				4,32,250
D	**ELECTRICAL SYSTEM**				
1	DOL starter (IP55) for following capacity motor with indicating lights, suitable rating , Push Button , Auto manula Switch , On/off Lights ,Digital ammeter & voltmeter. The Cost shall be inclusive on Power Cable , Termination and GI earthing, GI Cable Tray etc .				-
1.1	2.2 KW DOL Starter + MCB for AHU Kit	No	8	15,600	15,600
1.2	2.2KW DOL Starter With PID Control for Heater bank + SP MCB for AHU Kit	No	1	22,490	22,490
2	Supply, Installation, Testing & Commissioning of isolator switch with RCCB for Outdoor Unit with sheet metal enclosure, rain protection etc. as required to suit the site condition.				
2.1	63 A	No	7	2,450	17,150
	TOTAL CARRIED TO SUMMARY				**55,240**