

LOW SIDE BOQ

ITEM NO.	DESCRIPTION	QTY.	UNIT	SUPPLY RATE INR.	AMOUNT	INSTALLATION RATE INR.	AMOUNT
<b>PART - I</b>							
	<b>DUCTING &amp; INSULATION</b>						
	Providing, Fabrication, Installation and Testing of Prefabricated <b>G.I Ducting (120 GSM)</b> in L-shaped. (Prefabricating Ducting means duct fabrication on CNC machines) Ducting will have M.S. Angle Flanges (Flange joint Nut bolts shall be for every 100mm Distance) with Epoxy based primer, followed by epoxy black colour, with Food Grade 5mm Foam Gasket to be used between MS flange. All Ducting seam to be sealed with RTV Sealant. All Necessary duct support are part of the Duct Installation. All Ducting to prepared at factory in L-shape. Leak testing of Supply and return duct as per DW-143 standard. Leak testing Machine to have printing facility. All Duct angle support ends shall be closed with soft rubber caps and all threaded rod support ends shall be capped with soft rubber cups. Note: Ducting measurement will be as per installed ducting only. No separate allowance will be provided for pieces like taper, elbows, offsets, collar, etc.(MS angle flanges selection & duct construction to be done as per SMACNA standard)	210	Sq. Mtr	0	0		0
1	0.63 mm thick duct (24sqwq)(Duct Size upto 750 mm)	80	Sq. Mtr	0	0		0
2	0.81 mm thick duct (22sqwq)(Duct Size upto 750-1200 mm)	RO	Sq. Mtr				
3	1.00 mm thick duct (20sqwq)(Duct Size upto 1200-2000 mm)						
	Providing, Fabrication, Installation and Testing of <b>G.I Ducting (120 GSM)</b> fabricated at site. Ducting will have M.S. Angle Flanges with Epoxy based primer, followed by epoxy black colour, with Food Grade 5mm Foam Gasket to be used between MS flange (Flange joint Nut bolts shall be for every 100mm Distance). All Ducting seam to be sealed with RTV Sealant. All Necessary duct support are part of the Duct Installation. Leak testing of Supply and Return duct as per Smacna standard. Leak testing Machine to have printing facility. All Duct angle support ends shall be closed with soft rubber caps and all threaded rod support ends shall be capped with soft rubber cups. Note: Ducting measurement will be as per installed ducting only. No separate allowance will be provided for pieces like taper, elbows, offsets, collar, etc.	70	Sq. Mtr		0		0
1	0.63 mm thick duct (24sqwq)	40	Sq. Mtr		0		0
2	0.81 mm thick duct (22sqwq)	RO	Sq. Mtr				
3	1.00 mm thick duct (20sqwq)						
	Providing and Fixing Nitrile rubber with adhesive with one side aluminium faced minimum of 12 micron, (Class O). All insulation joints to be sealed with 4" width tape of the same material. Vendor to provide selection details accordingly. Thermal conductivity should not be more than 0.035 W/MK. Insulation to have "Class-O" Certification. Vendor to mark the arrows showing the direction of airflow in supply and return duct along with AHU no. mentioned in the duct. Vertical Droppers for terminal connection to be named as per the room name along with AHU numbers. Arrows of air direction on Supply duct to be shown with Green in colour, while return Duct to be Red in colour. Note: Insulation measurement will be as per installed quantity only. No separate allowance will be provided for pieces like taper, elbows, offsets, collar, flanges, dampers, etc. Vendor to consider adhesive recommended by Insulation manufacturer if required. Adhesive to be applied carefully so that	250	Sq. Mtr		0		0
1	19 mm thick - For Supply Duct	250	Sq. Mtr		0		0
2	13 mm thick - For Return Duct						
<b>TOTAL PART - I</b>							
<b>PART - II</b>							
<b>DIFFUSERS &amp; DAMPERS</b>							



ing and fixing or removable core. All **POWDER COATED SUPPLY / RETURN AIR Ceiling Diffusers** or aluminum duct. Diffuser to be fixed in the 20swg GI plenum box along with A.I. extruded volume control damper. The damper ring and the cores shall be 1 piece pressed type without any hair line crack. (The plenum box shall be measured in ducting quantity. The plenum box shall be of 100mm height.) **Colour of the diffuser to be confirmed by client.** (Submittal of item to be approved from client/consultant before procurement)(measurement to be done on site to suit size of diffuser)

**Providing and Fixing Extruded Aluminum Low Leakage Aerofoil Design Volume Control Dampers** suitable for Manual & Motorised operation for duct sub-branches & risers (Suitable for Actuator installation at latter stage). Dampers should have percentage open marking, locking in position and sealing arrangement. (Submittal of item to be approved from client/consultant before procurement)(minimum height for damper size is 0.15mtr)

**SQM Rate of Damper**

13	Sq.Mtr	0	0
3	Sq.Mtr	0	0

Supply & Installation Fire Dampers shall meet the fire resistance rating of 2 hours shall be tested and certified by CBRI. Fire Damper frame shall be galvanized steel of 1.6mm thickness, formed into a C channel in 4-piece construction with flanges suitable for duct connection. Damper Blades shall be single skin galvanized steel of 1.6mm thickness and must have 3 accurately rollformed longitudinal grooves for reinforcement and proper closure and operation. The blades shall be arranged in parallel to provide positive shut off. Each Blade shall have axles supported on both sides with sintered bronze self lubricating bearings turning in an extruded hole in the frame. All Blades shall be interconnected using linkage in the frame section. Each Damper shall be operated through a **UL stamped fusible link** rated at 74 or 100 Degree C. The closing of the fire damper shall be through a suitable rated spring which will be capable to close the blades in the event of fusible link disintegration. Option of indication of Blade Position should be made available either through a manual lever. Each Damper shall be supplied with a factory mounted sleeve made from Minimum 1mm thick galvanized steel of minimum 150mm length. **Fire damper to be provided with limit switch and wiring upto control panel to have interlock with AHU. Suitable control cabling to be considered for Fire damper, it will not be measured as an extra item and no additional cost will be provided. Fire damper should have potential free contact provision for integrating its open/close status to bms(future). Damper should have separate limit switch for**

**TOTAL PART - II**

**PART - III**

**CONTROLS**

1 Supply and installation of following sizes of pre-fabricated **hot dipped perforated type cable tray along with top cover, coupler plates, 90° bends, Tees, necessary nut-bolts / washers and other hardware etc.** including providing / fixing of necessary supports.

1.1 50mm (W) x 25mm (H) x 2mm (THK) cable trays

2 100mm (W) x 25mm (H) x 2mm (THK) cable trays

**TOTAL PART - III**

**PART - IV**

**VFD**

Supply and installation of HVAC Series, VFD with PID Loop and (Smart Logic Controller), Built in and with additional I/O Card suitable for Pharmaceutical application to Chilled, Hot water valve, terminal hot water coils to achieve Temp and RH, VFD to be suitable for Normal Induction Motor and PM Motor Operation. DC to be Built in to limit Harmonic Distortion. Modbus communication to available for BMS integration. Control cabling for Chilled Water Valve, Hot Water Valve and Terminal Heating Hot Water Valve to be considered

**TOTAL PART IV**

**PART - V**

**MISCELLANEOUS WORK**

1



